Golden Mountains of Altai

2020 Conservation Outlook Assessment

SITE INFORMATION
Country: Russian Federation
Inscribed in: 1998
Criteria: (x)

The Altai mountains in southern Siberia form the major mountain range in the western Siberia biogeographic region and provide the source of its greatest rivers – the Ob and the Irtysh. Three separate areas are inscribed: Alataisky Zapovednik and a buffer zone around Lake Teletskoye; Katunsky Zapovednik and a buffer zone around Mount Belukha; and the Ukok Quiet Zone on the Ukok plateau. The total area covers 1,611,457 ha. The region represents the most complete sequence of altitudinal vegetation zones in central Siberia, from steppe, forest-steppe, mixed forest, subalpine vegetation to alpine vegetation. The site is also an important habitat for endangered animal species such as the snow leopard. © UNESCO

SUMMARY
2020 Conservation Outlook
GOOD WITH SOME CONCERNS

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The values of the site continue to remain well preserved due to the remote location and large size of the site and commitment to conservation and management. The protected areas comprising the World Heritage site would still benefit from additional investment in staffing and funding. More coherent planning and management is also required at the level of the entire serial site, as well as further harmonization of management with the surrounding landscape in the Altai Republic. Significant progress has been made to foster transboundary conservation efforts with neighboring Mongolia and Kazakhstan, evidenced by the transboundary biosphere reserve which covers a significant area of the Katunsky component of the site, and the MoU signed between the Administration of Protected Areas of the Mongolian Altai. However further progress could be made to fulfill the potential represented by the site to engage with Kazakhstan, Mongolia and China, including through the framework of the World Heritage Convention. Despite this overall favorable outlook, more than 15 years of a still unresolved debate about the possible construction of a major gas pipeline project within the site cast an enormous shadow on its conservation prospects. While the State Party has recently confirmed that the gas pipeline will not pass through the World Heritage site, the exact proposed alternative route has yet to be disclosed. The existance of a mining license in the Maly Kolychak deposit and the continued prospect of the Brekchiya mining operation within the vicinity of the site is another concerning issue which requires attention to ensure that no mining exploration and extraction within the deposits is permitted, as it could have negative impacts on the site's OUV. The construction of tourist infrastructure inside and outside the site is also a cause for concern if the potential impacts to the values of the site are not appropriately considered in the planning and construction process.
FULL ASSESSMENT

Description of values

Values

World Heritage values

► Intact mountain ecosystems with high diversity of plants and degree of endemism

Covering much of the ecosystem diversity of the Altai Mountains, the property boasts more than 2,000 vascular plants with some 10 percent being endemics (UNEP-WCMC, 2011). The numbers for the Altaisky Zapovednik are even more with some 1,400 vascular plants for this component alone and a degree of endemism of 17 percent and as many as 60 narrow endemics (IUCN, 1998). The IUCN evaluation of the World Heritage nomination further notes that the property is regarded a global centre of origin of the montane floristic assemblages of northern Asia, which have subsequently spread across parts of Central Asia, including a number of important crop plant relatives.

► Habitat for noteworthy terrestrial fauna

The large serial property conserves habitat for a broad array of species in an ecosystem mosaic along a major altitudinal gradient, which includes steppe, forest-steppe, coniferous forest, mixed forest, subalpine meadows, alpine tundra and glaciers (UNEP-WCMC, 2011). As many as 72 mammal species, 323 bird species, 11 species of herpetofauna and 5,000 invertebrate species - the latter in just one of the three components - have been recorded (UNEP-WCMC, 2011; IUCN, 1998). The arguably most spectacular mammal is the endangered snow leopard (Panthera uncia), for which the Altai serves as one “core area” in its global distribution (Jackson et al., 2008). Two of its prey species are likewise charismatic large mammals: the Siberian ibex (Capra sibirica, LC) and the near-threatened argali (Ovis ammon). The latter is often referred to as “Altai argali” even though sub-specific taxonomy remains unresolved (Harris et al., 2008). Other mammals include, for example, Siberian musk deer (Moschus moschiferus, VU), wolverine (Gulo gulo, LC), manul cat (Otocolobus manul, NT) and Eurasian lynx (Lynx lynx, LC) (UNEP-WCMC, 2011). Within the impressive avifauna, the endangered Saker falcon (Falco cherrug), golden eagle (Aquila chrysaetos, LC) and Altai snowcock (Tetraogallus altaicus, LC) stand out as particularly spectacular representations.

Other important biodiversity values

► Major and largely undisturbed freshwater ecosystems

It is no coincidence that the original nomination was named “Sources of the Great Ob” (State Party of the Russian Federation, 1995), illustrating that the critically important headwaters of major rivers, including the mighty Ob River are located in the Altai Range. Important rivers include the Katun and Biya. Among the numerous lakes within the property, Lake Teletskoye stands out as the Altai’s largest lake, second only to Lake Baikal in terms of surface area all across Siberia. The lake is in a good overall conservation state and not only visually stunning but renowned for its rich aquatic flora and invertebrate fauna (UNEP-WCMC, 2011; IUCN evaluation, 1998). The around 20 species of freshwater fish include the endemic Coregonus pravdinellus (Bogutskaya et al., n.d.).

Assessment information

Threats
Current Threats

Current concerns include the balance between legitimate local resource use and conservation and maintenance of the production capacity of grasslands, forests and water bodies and courses. Tourism is a local and seasonal concern requiring management attention, including within areas outside the site but which could incur impacts to the values of the site such as on Teletskoye Lake. While there are no concise data on the effects of climate change in the site, studies from elsewhere within the region suggest significant changes in glacial front succession and accelerating upward treeline shifting.

**Habitat Shifting/ Alteration, Temperature extremes**

*(Climate change)*

Documented consequences of changing temperature and precipitation in the Altai-Sayan region include glacial retreat, upward movement of vegetation belts and warmer and drier conditions in the steppe areas (Kokorin, 2011). In Katunsky Strict Nature Reserve, temperature increases are of greater magnitude at lower altitude (Yashina, 2011). Despite observable changes, there are no concise data on the ecological effects of climate change in the site. However, studies from elsewhere within the region suggest significant changes in glacial front succession (Cazzolla Gatti et al., 2018) and accelerating upward treeline shifting (Cazzolla Gatti et al., 2019) which suggest similar trends are likely within the site.

**Livestock Farming / Grazing**

*(Livestock grazing)*

With the exception of the glaciated areas most of the Altai range has been grazed by livestock throughout its ongoing human history, including what is today the World Heritage site. Livestock grazing can be an adapted use of ecosystems, but it can also result in important impacts when the grazing intensity exceeds the capacity of the rangeland, resulting in erosion and changes in species composition of the native vegetation. Less visible impacts include competition with native grazers, disease transmission between livestock and native fauna and incentives to control or remove livestock predators. Overgrazing has been suggested for parts of the Ukok Plateau while acknowledging uncertainty in terms of extent and impact (Debonnet et al., 2012) and has in the past been attributed as the “principal human impact to date” (IUCN, 1998), while also stressing that it remained “isolated and at a low level.” More recently, Ibisch et al. (2015) listed overgrazing as a “very high threat” in the biosphere reserve overlapping with the site. It is clear that livestock grazing is both a major livelihood and a major conservation issue, which requires careful attention.

**Fire/ Fire Suppression**

*(Wild fires)*

Altaisky Strict Nature Reserve is particularly susceptible to wild fires (Onuchin, 2012). It remains less than clear to what degree the frequent fires are part of natural disturbance regime and to what degree they are anthropogenic. At this stage, there is no evidence that the fire regime - regardless of the reasons of the fires - constitutes a major threat.

**Hunting and trapping, Logging/ Wood Harvesting, Fishing / Harvesting Aquatic Resources, Other Biological Resource Use**

*(Risk of excessive natural resource harvesting)*

A broad range of local natural resource use occurs in the Altai Mountains, including the property. Medicinal plant collection and poaching have been listed as threats in Ukok Qiet Zone Nature Park (Debonnet et al., 2012); poaching has also been listed as a (minor) threat to Altaisky Strict Nature Reserve, with numerous cases detected and prosecuted in the past (Rao et al., 2007). Helicopter hunting has also been reported (UNEP-WCMC, 2011; IUCN, 2009). Poaching threatens a number of large charismatic species, including those of conservation concern such as Argali sheep, Siberian ibex, musk
deer and snow leopard, the latter related to both the wildlife trade and in the form of retaliation killings (Jackson et al., 2008). While commercial timber extraction is not an issue in the property, local communities do harvest non-timber forest products, including for commercial use and export (Rao et al., 2007). Fishing is common in the rivers and lakes. Notably, unregulated fishing takes place in Lake Teletskoye, a significant portion of which lies outside any form of protective legislation, which may be impacting the values of the site given the inability of the site management to enforce catch regulations in this area (State Party of Russia, 2020). This particular threat may increase should the proposed tourism infrastructure plans on the lake go ahead. The Lake Kaldzhin-Kol-Bus in the Ukok Quiet Zone Nature Park was allegedly illegally leased for the aquaculture for fishing Thymallus arcticus arcticus (IUCN Consultation, 2020).

Tourism/ visitors/ recreation
(Localized tourism impacts)

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

Most of the property is remote and relatively difficult to access, which severely limits tourism. The threat from tourism appears to be localized at this point in time (Debonnet et al., 2012, UNEP-WCMC, 2011, Rao et al., 2007, IUCN, 1998). However, tourism is growing (State Part of the Russian Federation, 2017) resulting in signs of impacts, especially in the Ukok Quiet Zone Nature Park (IUCN et al., 2017). A large number of tourists visit Belukha Nature Park (Belukha Mountain, Akkem Lake, Kucherla lake), Multa Lakes, Teletskoye Lake. For example, IUCN et al. (2017) mention unauthorized presence of tourist groups on the shores of Lake Teletskoye. Tourism infrastructure is being developed. On the shore of lake Teletskoye, land plots have been leased, a tourist complex has already been built on them («Golden Village»), and it is planned to build a large all-season recreational cluster. On Darashkol Lake several land plots have leased for the development of recreational infrastructure; on one of the plots the 2 houses were built. Mass competitions in trail running are planned in the Ust-Koksa District of the Altai Republic in 2021. Aut81 and Aut128 routes are laid along the eastern shore of the Lower Multa and Middle Multa Lakes (these are part of the Multa Lakes Nature Monument included in the boundaries of the Golden Mountains of Altai World Heritage property).

Furthermore, Ibisch et al. (2015) suggest the lack of sharing tourism benefits with local communities to be the main concern. However an ecotourism strategy has now been developed for the Katunskiy Reserve in response to multiple World Heritage Committee requests (World Heritage Committee, 2017; 2018; 2019; Debonnet et al., 2012).

Potential Threats

High Threat
The possible construction of a major gas pipeline through one of the components of the serial site constitutes the highest threat to the natural - and cultural - values of the Golden Mountains of Altai. The decision to route the pipeline outside the site, confirmed at the highest political level, is a major success. However, there are still uncertainties regarding the project, including the exact new route of the pipeline outside the site, and undertaking of a full EIA which considers any impacts on the Outstanding Universal Value of the site. Given that such infrastructure, even if located outside the boundaries of the site might result in significant negative impacts and in the absence of an EIA, this threat remains high despite the information that the pipeline will not pass through the site. The current prospect of gold mining in the Maly Kolychak and Brekchiya deposits, which lie in the vicinity to the site is another threat with potentially high associated impacts.

Oil/ Gas exploration/development

(Proposed construction of a gas pipeline crossing the property)

High Threat
Inside site, extent of threat not known
Outside site

As well documented throughout the official World Heritage documentation for the site over the last years, the possible construction of a gas pipeline from the Russian Federation to China has been the main concern about the site in addition to triggering local opposition. While details and the exact state of current planning and negotiations remain somewhat unclear and no impact assessment appears to be under elaboration, the State Party has ruled out the option to route the pipeline through the World Heritage site (State Party of the Russian Federation, 2020) in response to multiple requests from the World Heritage Committee on the grounds that doing so would constitute a clear basis for inscription of
the site on the List of World Heritage in Danger due to negative impacts, including habitat destruction/degradation through soil movement, engineering works during construction of the pipeline and service road, hydrological alterations, disturbance, pollution and secondary threats such as increased poaching through improved access (Rao et al., 2007). However, aspects of the project remain unclear, particularly the exact new route of the pipeline (UNESCO, 2019).

**Mining/ Quarrying**

*Gold mining in the vicinity of the site*

Currently a license for geological exploration and mining of placer gold in the Maly Kolychak deposit, which lies outside the site is held by a mining company which expires August 11, 2027. There is currently no mining activity reported within the deposit and no indication that the company has violated any conditions of the license. The State Party of the Russian Federation has indicated that should they receive information that indicates any such violation, early termination of the license will be considered in accordance with the relevant laws (State Party of the Russian Federation, 2020). However, any mining activity may have significant impacts to the OUV of the site and should be fully considered in an EIA process. Additionally, whilst it has been confirmed that the gold mining project at Brekchiya gold deposit will only go ahead if cleared by a full EIA, it has not been confirmed whether, should the project proceed to the EIA stage, the potential impacts on the Outstanding Universal Value of the site will specifically be assessed (World Heritage Committee, 2019).

**Overall assessment of threats**

Overall, the threats to the Golden Mountains of Altai are high, despite the the remote location and size of the site. The most tangible threats are manageable even though they may require increased funding and staffing to keep up with increasing tourism pressure, for example. The construction of tourist infrastructure inside and outside the site can be a serious threat. As clearly and repeatedly articulated by the World Heritage Committee, the possible construction of a gas pipeline, even based outside the boundaries of the site, may affect the conservation values of the site negatively, without full consideration of impacts to the Outstanding Universal Value of the site prior to construction. The same applies for mining operations within the vicinity of the site that may incur significant threats to the sites values.

**Protection and management**

**Assessing Protection and Management**

**Management system**

Currently, all three components comprising the World Heritage site have individual management plans and an overall management strategy for the site was developed in 2008. However, according to Debonnet et al. (2012), it did not meet the expectations defined in the Operational Guidelines in terms of a joint management framework. The differing governance and protective designations across the components of the site, with federal and regional management responsibility, respectively, implies a need for harmonization. Furthermore, the recent designation of the transboundary biosphere reserve (UNESCO, 2018), raises the prospects for harmonization between the Russian Federation / Altai Republic and neighbouring Kazakhstan. In summary, more is needed to harmonize the coherent management of the serial property in line with World Heritage expectations.

**Effectiveness of management system**

The management effectiveness of the individual components which comprise this serial site may be mostly effective in isolation. However, as noted by Debonnet, 2012, the proposed overall management
strategy for the entire site does not meet the standards set out in the Operational Guidelines for effectively applying a joint management framework. As such, coordinating an effective integrated management framework for the entire property may greatly enhance the management system. Additionally, funding and staffing constraints, and complex and fragmented management authority and land tenure have reduced the overall management effectiveness (Debonnet et al., 2012). There is no evidence to suggest that these issues have been resolved to the extent required to be considered effective, despite some progress towards implementing the recommendations made by the 2012 Reactive Monitoring Mission (Debonnet, 2012) towards these ends. Lack of staff in the regional protected areas remains of concern. According the official website of the Directorate of Specially Protected Natural Areas of the Altai Republic only 3 state inspectors guard each nature park (https://oopt-ra.ru/index.php/ob-uchrezhdenii/struktura).

▶ Boundaries

This serial site is composed of three clearly defined components, each having varying federal and regional designations prior to inscription on the World Heritage list, which have continued in the current management regime. Within each component, internal zonation is used to determine access and use with traditional use of grazing pastures clearly designated and managed, while new areas currently being developed for tourism are being integrated into the zonation planning of each component. While spatially clearly defined, the legal status of some of the zones is less than clear (Debonnet et al., 2012). A current issue of some concern is that a significant area of Lake Teletskoye remains under no formal protective legislation, since this is currently allowing poaching and unregulated fishing to potentially negatively impact the values the site (UNESCO, 2019). Despite requests from the World heritage Committee to address this issue, no further information on the extension of the Strict Nature Reserve to cover the entire basin of the lake has been provided to date.

▶ Integration into regional and national planning systems

Information on the integration of the management of the serial World Heritage site into regional and national planning systems is scarce, even in regards to the coordination among the components, and the management system could perhaps be improved through greater harmonization between components of the site. However, the designation by the Russian Federation and Kazakhstan of the transboundary biosphere reserve overlapping with the Katunsky Reserve component of the site is evidence of effective regional transboundary conservation efforts. Furthermore, the recent signing of an MoU between the Katunsky Reserve and the Administration of Protected Areas of the Mongolian Altai, is another example of substantial efforts in transboundary conservation approaches (UNESCO, 2018). As such, the site represents an example of both excellent achievement in the integration of conservation policy and action across borders in the region between Russian Federation, Kazakhstan and Mongolia as well as an opportunity to continue consolidating these efforts, including within the framework of the World Heritage Convention.

▶ Relationships with local people

Civil society played an important role in the nomination effort through direct involvement of non-governmental organizations. At the same time, the involvement of indigenous peoples and local communities in the governance and management has been modest by comparison. Striking previous examples include the limited local benefits of tourism and the lack and alleged efforts to prevent civil society representatives from attending the stakeholder meetings during the 2012 reactive monitoring mission (Debonnet et al., 2012). The World Heritage Committee has repeatedly urged the State Party to involve local communities in more meaningful ways, for example as regards the proposals for infrastructure development in ecologically and culturally sensitive areas (World Heritage Committee, and 2007). More recently, the World Heritage Committee (2012) requested the State Party to “strengthen the cooperation with the civil society and in particular the indigenous communities, taking advantage of their knowledge relevant for the management of the property”. Recent efforts have been made to address this issue, including greater reported involvement of local communities representatives, indigenous people, businesses and local authorities in the management of the Altai Reserve component and the recent formation of the Public Council which serves as a platform for local communities to engage in issues relating to the

Legal framework

The varying national and regional designations of the components render each subject to inconsistent legal status according to their corresponding federal or regional standards and protocols. This is not per se a problem and there are no indications that this set-up has been a major bottleneck in terms of management effectiveness. Debonnet et al. (2012), however, suggested a “weak legal status of the regional nature parks”. Despite the clear regional responsibility for those areas, the World Heritage Convention comes with a federal role also. Both reactive monitoring missions have recommended the establishment of an overarching legal framework for the management of the entire natural World Heritage property, as has been recommended by the World Heritage Committee (Debonnet et al., 2012; Rao et al., 2007). A major piece of applicable legislation is the Federal law “On Specially Protected Natural Areas”, No. 33-FZ dated 1995. However, a more recent law (Federal Law No. 365-FZ dated 2011) has been interpreted as significantly weakening the protection status of the components recognized as federally protected Strict Nature Reserves, in particular to the apparent changes in terms of the possibility to build infrastructure. At the subnational level, Decree 212 N 202 dated 2 August 2012 of the Republic of Altai raises similar concerns in terms of infrastructure development, which is why the World Heritage Committee (2017) urged the State Party to revoke the decree. Due to the ongoing legal possibility to construct infrastructure incompatible with natural World Heritage status, the situation remains a serious concern.

Amendments to the federal law «On Environmental Review» were adopted in July (254-FZ dated 31.07.2020). Under the reformed legislation, the State Environmental Review is not required for the construction or reconstruction of any capital construction projects within the boundaries of specially protected natural areas of regional significance. Since the World Heritage site «The Golden Mountains of Altai» include five specially protected natural areas of regional significance (Ukok Quiet Zone Nature Park, Belukha Nature Park, Belukha Mountain Nature Monument, Lake Teletskoye Nature Monument, Multa Lakes Nature Monument), according to federal legislation, construction can begin there without an assessment of the project’s impact on natural complexes. This is of concern, especially in the context of the proposed infrastructure development projects surrounding the site.

Law enforcement

Enforcement suffers from budget and staffing constraints. An even more fundamental concern was expressed on the occasion of the most recent reactive monitoring mission. Debonnet et al. (2012) stated that the regional authorities managing the non-federal components of the site may not have an obvious law enforcement mandate.

Implementation of Committee decisions and recommendations

Debonnet et al. (2012) acknowledged significant efforts to follow up on some of the management-related recommendations formulated by the 2007 reactive monitoring mission, which were fully endorsed by the World Heritage Committee. However, the focus of Committee decisions and recommendations has been the proposed gas pipeline ever since the Observer of Russia informed the World Heritage Committee about the project in 2000 (World Heritage Committee, 2000). In fact, there are direct references to the project in decisions approved at its 24th, 25th, 30th, 31st, 32nd, 33rd, 35th, 36th, 37th, 39th, 40th and 41st sessions. In a nutshell, the Committee has repeatedly been requesting information on the planning status of the project to limited avail. Expressing its utmost concern, the Committee has clearly established the position that any decision to go forward with the gas pipeline project through the property would constitute a threat to the site’s Outstanding Universal Value and represent a clear case for inscription of the property on the List of World Heritage in Danger. Therefore, the Committee urged the State Party to take an unequivocal decision to abandon the construction of the Altai gas pipeline through the property, and ensure that no further preparatory works be undertaken within the property, and to ensure that the pipeline developer Gazprom considers alternative routes. At its most recent session, the World Heritage Committee welcomed the confirmation that the route would pass around the site, but requested the State Party to provide the details of the exact alignment of this
alternative route (World Heritage Committee, 2019). No confirmation has been received on this as of yet.

**Sustainable use**

Sustainable use zones are well integrated into the protected areas constituting the site; the most significant of which are livestock husbandry and the use of a wide range of non-timber forest products and other wild biodiversity products (Debonnet et al., 2012). The use constitutes a necessity for local communities and indigenous peoples, who have traditional practices and cultural values attached to these uses. Although such use within the boundaries of the site bears the risk of excessive use, the traditional element of many of the land use practices suggest that such activity is likely to be sustainable. Monitoring the situation as a foundation to maintain the balance is a permanent management requirement. The growing tourism market in the region represents and increased need for management efforts to address any associated threats, especially in light of proposals for tourism infrastructure to be built along the unprotected area of Lake Teletskoye (UNESCO, 2018) and on the Darashkol Lake (Katunsky State Nature Reserve and buffer zone of Belukha Mountain cluster) (IUCN Consultation, 2020).

**Sustainable finance**

Funding is primarily based on separate governmental budgets from the federal and regional level, respectively. While no detailed and updated information is available, key sources consistently state insufficient funding since the IUCN evaluation (Debonnet et al., 2012, UNEP-WCMC, 2011, IUCN, 1998). The gap is somewhat compensated by a series of projects over the years from multi-lateral and non-governmental sources, which provided substantial support over many years. The concern is that more or less short-lived project support does not amount to a reliable funding approach and cannot be considered sustainable.

**Staff capacity, training, and development**

Altaisky and Katunsky Strict Nature Reserves benefit from adequate staff numbers of some 100 and 70, respectively. The sub-national categories, nature parks and a natural monument, are modestly staffed, consistently considered insufficient (Debonnet et al., 2012, UNEP-WCMC, 2011, Rao et al., 2007). No information about staff training and development programmes is available.

**Education and interpretation programs**

Visitor education and awareness-raising programmes are integral parts of management, particularly in the Strict Nature Reserves (State Party of the Russian Federation, 2017; Debonnet et al., 2012). These are also tied to the broader communications strategies for the reserves, for example the recent establishment of the “Reserve without Borders” initiative in the Altai Biosphere Reserve organizes regional media outlets for wider information sharing on the Reserve’s work. The Katunskyi Reserve management also engage in partnerships representing different sectors – research institutions, environmental NGOs, educational organizations, business-companies and local communities- targeted to support conservation, research and education activities of the reserve from different sectors of civil society (State Party of the Russian Federation, 2020).

**Tourism and visitation management**

Large tracts of the property are rarely visited. Consequently, there are no corresponding concerns across most of the property. However, in a few selected locations, tourism is a major and growing factor, with reports of unauthorized vehicle entries, which requires management attention. A large number of tourists follow the routes to the Belukha Mountain and Akkem Lake, Kucherla Lake, visit Multa Lakes, Teletskoye Lake and Ukok Quiet Zone Nature Park (IUCN Consultation, 2020). Tourism infrastructure projects have been proposed for the banks of Lake Teletskoye and Darashkol Lake. Any such infrastructure may increase tourism pressure on the Lake Teletskoye area of the site, especially in the apparent absence of a cohesive sustainable tourism management plan and the lack of capacity to enforce management interventions in the area of the lake which is not currently under any protective legislation.
Monitoring

The level and approach to monitoring varies significantly across the three components of the site. The monitoring of the Katunskiy Reserve centres activities coupling biodiversity data such as population ecology of indicator species with data on threats to these values such as on biochemical air pollution indicators and glacial retreat (State Party of Russian federation, 2020). There are a number of noteworthy monitoring activities at the level of academic and non-governmental projects, often focusing on charismatic species in addition to monitoring integrated into routine management. There is room to consolidate and scale up the existing monitoring to coherently cover the entire serial site, as recommended by the most recent reactive monitoring mission (Debonnet et al., 2012).

Research

There is a long history of research being carried out in cooperation between the research departments of the protected areas, the Siberian Branch of the Russian Academy of Sciences, universities and other partners. For example, five universities have been cooperating in a global change research programme (UNEP-WCMC, 2011). Publication databases reveal an impressive number of around 1,000 peer-reviewed journal articles in international scientific journals in the fields of ecology, biodiversity and conservation about the mountain region.

Overall assessment of protection and management

The current management of the site and the protected areas comprising it has some strong elements; however, some aspects raise concerns. The World Heritage documentation contains many hints at room for improvement, as detailed in the recommendations of two reactive monitoring missions. Such recommendations include staffing, funding, the legal framework, involvement of indigenous peoples and local communities in governance and management, clarification and strengthening of mandates and in the subnational protected area categories, and a more coherent and strategic approach to tourism development. Whilst progress has been made in implementing many of these recommendations (State Party of the Russian Federation, 2018; 2019; 2020), there are still many to be achieved (World Heritage Committee, 2018; 2019). The site has exceptional potential in terms of both the integration of culture and nature and transboundary cooperation (Debonnet et al., 2012; Michel et al., 2004).

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

The World Heritage site benefits from being surrounded by vast areas of comparable steppes and mountains with a high degree of naturalness, limited infrastructure and low population density. The location at the meeting point of four countries necessarily implies that management and conservation of actual or potential threats must be based on coordination and cooperation with at least one and ideally all three direct neighbors. Investment in cooperation amounts to investment in addressing current and future external threats. Efforts have been underway for more than a decade to agree on the extension of the property into China, Kazakhstan and Mongolia (Debonnet et al., 2012, Michel et al., 2004). The transboundary biosphere reserve between the Russian Federation and Kazakhstan designated adds one layer of additional management and conservation attention and serves as an encouraging indicator of direct interest in more meaningful dialogue. Further cooperation is evident in the recent MoU signed between the between the Katunsky Reserve and the Administration of Protected Areas of the Mongolian Altai. Progress towards such transboundary cooperation and management should continue to be made, including within the framework of the World Heritage Convention (UNESCO, 2019).

State and trend of values
Assessing the current state and trend of values

**World Heritage values**

- **Intact mountain ecosystems with high diversity of plants and degree of endemism**
  - Low Concern
  - Trend: Stable

  The various mountain ecosystems in and around the components of the serial property have a high level of integrity without an overall trend of deterioration (Debonnet et al., 2012). A range of human activities is occurring, such as livestock husbandry, fires, localized tourism, use of wild plants and animals, which could potentially affect the integrity, especially when considering the uncertainty about the impacts of already observable climate change. Although data within the site itself is lacking, there is evidence within the region to suggest increasing effects of climate change are being felt on ecosystem structure and function. However overall, given the size, remoteness and intactness of the site, this value remains of low concern.

- **Habitat for noteworthy terrestrial fauna**
  - High Concern
  - Trend: Data Deficient

  The habitats of the large property are largely in an exceptionally intact state and the various components are embedded in a vast and remote mountain landscape with a high degree of naturalness. From a species conservation perspective, the main concerns are poaching of snow leopard, Argali, Siberian ibex and other mammals within and outside the property, including musk deer for commercial purposes (Paltsyn et al., 2012). Given the ecological, symbolical and cultural significance of the charismatic flagship species snow leopard, Argali and Siberian ibex, the pressure on both species is considered a high concern despite the absence of exact and reliable data. Increased monitoring and reporting of data would allow greater understanding of this value.

**Summary of the Values**

- **Assessment of the current state and trend of World Heritage values**
  - Low Concern
  - Trend: Stable

  The Golden Mountains of Altai site continues to represent an outstanding example of an intact mountain ecosystem, which harbours a large proportion of the montane plant and animal species indicative of northern Asia, however the effects of climate change are likely to be increasing given evidence of shifting ecosystem functioning elsewhere in the region. The site as a habitat for charismatic and noteworthy terrestrial fauna is of greater concern as, although data is lacking, there is no evidence to suggest that the poaching of large mammals, including snow leopard, the apex predator of the Altai Mountains has been reduced. Other than that neither the state nor the trend of the World Heritage values is of major concern, provided the plans for construction of a major gas pipeline crossing the site or in any other location directly or indirectly affecting the Outstanding Universal Value of the site, do not proceed.

- **Assessment of the current state and trend of other important biodiversity values**
  - Data Deficient
  - Trend: Data Deficient

  The fishing pressure and its direct and indirect consequences are not sufficiently known to permit a specific assessment. The effects of industrial air pollution reported to stem from heavy industry in Kazakhstan are likewise not known in detail, as are the effects of debris from rocket launches (Rao et al., 2007). Both are potential sources of water contamination.
Additional information

Benefits

Understanding Benefits

► Direct employment

The protected areas contributing to the reserve offer ca. 184 jobs (Debonnet & Lethier, 2012), in a remote area with little population. There is room for increasing the number of jobs, particularly in the Nature Parks that form part of the site. Beyond this, the values of the site offer opportunities for additional employment through sustainable natural resource use and tourism.

► Collection of wild plants and mushrooms,
Fishing areas and conservation of fish stocks,
Livestock grazing areas

The collection of wild plants is practiced, both for subsistence and for trade, including international trade, e.g. to Japan (Rao et al., 2007). Freshwater fish is part of the local diet. Mobile herding is a central element of local livelihood systems.

► Cultural identity and sense of belonging,
History and tradition,
Sacred or symbolic plants or animals,
Sacred natural sites or landscapes,
Wilderness and iconic features

The Altai Mountains, including all three components of the property have a long human history and harbor significant cultural and spiritual values (Debonnet et al., 2012). The exceptionally rich history is epitomized in the nearby Petroglyphic Complexes of the Mongolian Altai, a cultural World Heritage property inscribed in 2011 in neighboring Mongolia and - within the property - in the Ukok Plateau, which is numerous petroglyphs and tomb mounts dating back to the bronze age, and also the place where the burial site of a 2,500 year old Ukok Princess was found in the 1990s (Altai Republic, 2003). However, the cultural and spiritual dimension of the Altai Mountains is by no means a thing of the past. Rather, it lives on in the cosmovision and belief systems of contemporary inhabitants (Erdenetsogt, 2017; IUCN et al., 2015).

Factors negatively affecting provision of this benefit:
- Climate change: Impact level - Moderate, Trend - Increasing

There are concerns that the permafrost that preserved the burial kurgans for thousands of years is now melting away because of rising air and ground temperatures in the region (Raygorodetsky, 2013).

► Collection of medicinal resources for local use,
Outdoor recreation and tourism,
Natural beauty and scenery

Mountain tourism is practiced at a moderate intensity already on site, with only a few localized major tourism areas. Visitors are primarily attracted by the exceptional and unspoiled mountain scenery. Medicinal resources are collected as they are all across the Altai Range.

► Importance for research,
Contribution to education,
Collection of genetic material

The site has been contributing significantly to the scientific understanding of many facets of the Altai Mountains, as evidenced by the huge number of scientific literature based on work in the components of the property. It is beyond question that the local communities and indigenous peoples who continue to live in direct interaction with and dependence on the harsh mountain environment, have sophisticated complementary knowledge about the mountains, including the property. The considerable diversity of
wild varieties of crop plants and endemic plants represents a great genetic reservoir for a wide range of uses.

- **Carbon sequestration,**
- **Soil stabilisation,**
- **Flood prevention,**
- **Water provision (importance for water quantity and quality)**

Both the grasslands and the various forest types contribute to carbon sequestration and storage and simultaneously soil protection. Harboring numerous lakes, creeks and rivers, including the largest lake of the entire range and headwaters of the mighty Ob River, the regulates and provides large quantities of high-quality water to downstream users.

- **Collection of timber, e.g. fuelwood,**
- **Sustainable extraction of materials (e.g. coral, shells, resin, rubber, grass, rattan, etc)**

In the forested parts, firewood tends to be a major or even the only source of energy. Many non-timber forests products are being harvested, including the perhaps best-known product, the seeds of the Siberian stone pine.

**Summary of benefits**

The site and its surroundings are rich in biodiversity products and have been used in many ways for long periods of time by indigenous peoples and local communities who continue to be largely dependent on local natural resources to this day. Uses include natural pastures and a broad range of wild biodiversity for food, construction and medicine etc. Both locals and visitors are inspired by the overwhelming beauty of the mountains which have been inhabited and revered by the many cultures and ethnic groups which have been meeting in the Altai throughout its ongoing human history. Furthermore, water comes to mind as a major ecosystem service, with the site protecting a major freshwater reservoir and the headwaters of one of the world’s largest rivers, the Ob. As in the case of carbon sequestration, it is important to recall the large size of the site which contributes to its significance in terms of all benefits.
REFERENCES

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