IUCN Conservation Outlook Assessment 2017 **(archived)**
Finalised on 08 November 2017

Please note: this is an archived Conservation Outlook Assessment for El Pinacate and Gran Desierto de Altar Biosphere Reserve. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

El Pinacate and Gran Desierto de Altar Biosphere Reserve

SITE INFORMATION

Country:
Mexico
Inscribed in: 2013
Criteria:
(vii) (viii) (x)

Site description:

The 714,566 hectare site comprises two distinct parts: the dormant volcanic Pinacate Shield of black and red lava flows and desert pavements to the east, and, in the west, the Gran Altar Desert with its ever changing and varied sand dunes that can reach a height of 200 metres. This landscape of dramatic contrast notably features linear, star and dome dunes as well as several arid granite massifs, some as high as 650 metres. The dunes emerge like islands from the sea of sand and harbour distinct and highly diverse plant and wildlife communities, including endemic freshwater fish species and the endemic Sonoran Pronghorn, which is only to be found in northwestern Sonora and in southwestern Arizona (USA). Ten enormous, deep and almost perfectly circular craters, believed to have been formed by a combination of eruptions and collapses, also contribute to the dramatic beauty of the site whose exceptional combination of features are of great scientific interest. The site is also a UNESCO Biosphere Reserve.
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SUMMARY

2017 Conservation Outlook

Good with some concerns

EPGDABR is in a privileged position as the harsh environmental conditions and inhospitable terrain provide a high degree of natural protection. Populations of the flat-tail horned lizard, the Yuma fringe-toed lizard, the Sonoyta pupfish, the Sonoyta mud turtle, the lesser long-nose and fish-eating bats, and Goode's horned lizard, should be evaluated and monitored. Water stress, alien invasive species and anticipated climate change will likewise put new pressures on the area. At the same time, the current capacity of the management to address these threats is limited by the lack of human and financial resources, affected by the recent overall budget cuts in Mexico's federal government programmes, which raises questions about the longer term capacity. Efforts should be soon implemented to address staff issues, in particular the appointment of a Director and increasing the number of personnel; as well as to ensure proper and sustainable funding to operate and manage the Reserve.

Current state and trend of VALUES

Low Concern
Trend: Stable

The visual integrity remains intact despite inevitable impacts of expanding road and energy transmission infrastructure. There are no factors which are likely to alter or impact on the geological values of the site. Despite multiple threats, flora and fauna do not appear to be under acute threat. However, the Sonoran Pronghorn continues to face an uncertain future. Populations of the flat-tail horned lizard, the Yuma fringe-toed lizard, the Sonoyta pupfish, the Sonoyta mud turtle, the lesser long-nose and fish-eating bats, and Goode's horned lizard, should be evaluated and monitored. Overall, despite ongoing threats and management challenges, important improvements make EPGDABR a conservation success story.

Overall THREATS

Low Threat

The large scale of the property, its contiguity with an even larger set of protected areas, the high degree of natural protection and the dedicated conservation efforts combine to make the property comparatively resilient. However, a number of threats raise concerns, including invasive species, increasing water consumption in the broader region, as well as security measures and infrastructure along the international border between Mexico and the USA. While the acute threats appear understood and manageable, there are more serious concerns about alien invasive species) and anticipated climate change. Both could lead to dramatic changes to the desert ecosystem. As regards invasive species, such change is already observable elsewhere in the Sonoran Desert where non-native grasses and associated increase in fire frequency and intensity have fundamentally altered the entire desert ecosystem. Mining concessions overlapping with the property and plans for salt extraction in its vicinity or even in its buffer zone also raise concerns.

Overall PROTECTION and MANAGEMENT

Some Concern

The current management efforts constitute a vast and continuous improvement compared to the early days when a first and much smaller protected area was designated. However, a number of concerns exist, particularly with regards to human and financial resources, also affected by the recent overall budget cuts in Mexico’s federal government programmes, which raises questions about the longer term capacity. Efforts should be soon implemented to address staff issues, in particular the appointment of a Director and increasing the number of personnel; as well as to ensure proper and sustainable funding to operate and manage the Reserve. Conflicts with the ejidos should be soon resolved in a way that is fair to those land owners and ensure their long-term support to the Reserve.

FULL ASSESSMENT

Description of values

Values

World Heritage values

► Extraordinary landscape beauty

Criterion:(vii)

The El Pinacate and Gran Desierto de Altar Biosphere Reserve (hereafter EPGDABR) is visually stunning through the stark contrast of the dark-colored volcanic shield with its spectacular craters and lava flows next to vast dune fields. At a finer scale, there is an impressive diversity of landscape features, colors, shapes and forms. The elevated areas permit magnificent views, all the way to the adjacent Gulf of California and even the Baja California Peninsula (SoOUV, 2013).

► Extraordinary volcanic and geological features

Criterion:(viii)

The Pinacate, including the Gran Desierto, is the largest (500,000 ha) dune field in the New World and also has 200,000 ha of spectacular volcanic formations, one of the greatest concentrations in the world of giant Maar-type craters, and close to four-hundred cinder cones. A wide variety of volcanic and other geological features make the property geologically extremely complex. The Pinacate Volcanic Field boasts an exceptional aggregation, quality and conservation status of giant Maar craters and an unusual shield volcano, Volcán Santa Clara. The dynamic geomorphology of the dunes and the volcanic shield is highly diverse, intact and of large scale. The vast sea of sand dunes that surrounds the volcanic shield is considered

the largest and most active dune system in North America (SoOUV, 2013).

► Scientific importance of volcanic and geological features
Criterion:(viii)

Scientists have described EPGDABR as a "living textbook" due to the combination of the wide array of features, their excellent condition and the clear display of volcanic behaviour patterns and of different stages in Earth history. The combination of earth science features is an impressive laboratory for geological and geomorphological studies (SoOUV, 2013). Its large sand sea originated from Colorado River sediments primarily in the Pleistocene, but lowered sea levels during the last glaciation also might have played a role, exposing an additional 50 km of sand below the present tides.

► Rare, endangered and endemic species of flora and fauna
Criterion:(x)

The seemingly inhospitable habitat mosaic is home to more than 560 species of vascular plants, 44 mammals, more than 225 birds, 44 reptiles, 5 amphibians and 2 native fresh-water fishes -- the Sonoyta pupfish (Cyprinodon eremus) and the longfin dace (Agosia chrysogaster). Insect diversity is high and not even fully documented.
Endemics include two arenicolous lizards, the flat-tail horned lizard (Phrynosoma mcallii) and the Yuma fringe-toed lizard (Uma rufopunctata), both considered as Near Threated (IUCN) (Bezy et al. 2017); a local endemic plant restricted to a small part of the volcanic shield and several subspecies of plants endemics of the dunes of the Gran Desierto. Endemics include two freshwater fish species. There is a population of the endemic Sonoyta mud turtle (Kinosternon sonoriense longifemorale) which have recently declined markedly and should be closely monitored. The many other noteworthy species include the endangered subspecies of the Sonoran Pronghorn (Antilocarpa sonorensis), the Mexican subspecies of the bighorn sheep (Ovis canadensis mexicana) subjected to special protection, the Near Threated lesser long-nosed bat (Leptonycteris curasoae yerbabuenae) and the endemic (listed as Vulnerable) fish-eating bat (Myotis vivesi).

► Scientific importance (desert ecology and biology)
Criterion:(x)

Among the North American deserts and even within the transboundary Sonoran Desert EPGDABR stands out as a rare large-scale area with limited past and current anthropogenic modifications, thereby constituting a rare and valuable baseline reference.

Assessment information

Threats

Current Threats

Low Threat

The large scale of the property, its contiguity with an even larger set of protected areas, the high degree of natural protection and the dedicated conservation efforts combine to make the property comparatively resilient. However, a number of threats raise concerns, including invasive species, increasing water consumption in the broader region, as well as security measures and infrastructure along the international border between Mexico and the USA. Any new additional border infrastructure would further impact on the connectivity with potentially serious effects on populations of some species.

▶ Other

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

Direct impacts from vehicles are reported on the other side of the international border. The disturbance from surveillance and physical barriers limits the connectivity and thus affects both sides of the border (personal communication during IUCN evaluation; see also Cohn, 2007, Cordova et al., 2007, Lieberman Goodwin, 2000; Southwestern Association of Naturalists,. 2008). Any new additional border infrastructure would further impact on the connectivity with potentially serious effects on populations of some species.

► Mining/ Quarrying

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

Largely brought under control but still reported to occur (World Heritage nomination dossier of the property and IUCN, 2013).
The localized impacts of past extraction of volcanic ash (Morusa) and cinder mining of volcanic rock and pyroclastic material will be visible for a long time.
Gold mining further east in the state of Sonora deserves to be mentioned. Despite the distance from the property the mining area belongs to the range of the last Sonoran Pronghorns like the property itself. Mining may therefore negatively affect the flagship species of El Pinacate (Burquez y Martinez-Yrizar, 2006; Burquez y Castillo, 1994; Castillo-Sánchez, 1999).

Prior to the establishment of the Reserve, rock and sand extraction was one of the most productive activities (Brusca et al 2001). Currently, it seems that commercial extraction of sand, gravel and cinder in certain locations within the buffer zone is allowed. Plant extraction is currently practiced in the Pinacate Reserve on a small domestic scale and is not regulated. The principal species extracted are mesquite, ironwood, and ocotillo. Mesquite is used in construction and for firewood. As mentioned above, there are a few, scattered local settlements and it is from these settlements that the reserve is exploited of cinder, sand, volcanic rock, firewood, and fauna.

► Mining/ Quarrying

Low Threat
Outside site

Gold mining further east in the state of Sonora deserves to be mentioned. Despite the distance from the property the mining area belongs to the range of the last Sonoran Pronghorns like the property itself. Mining may therefore negatively affect the flagship species of El Pinacate (Burquez y Martinez-Yrizar, 2006; Burquez y Castillo, 1994; Castillo-Sánchez, 1999).
There is a large open-pit gold mine in the region (“Mina La Herradura”) (31°8'56"N 112°51'47"W), some 125 Km from Caborca, outside the Reserve and close the town of Sonoyta and operating since 1997. It is own by Minera Penmont S de RL de CV, a subsidiary of Fresnill PLC.

(http://www.fresnilloplc.com/; http://www.desi.economia.gob.mx/empresas/empresas3.asp?Clave=977).

► Roads/ Railroads

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

The relatively recent construction of the coastal route has facilitated unprecedented access and could lead to new roads being created. The ongoing expansion of Route 2 near the border is accompanied by extraction of construction material and water, construction of temporary deviation and access tracks, noise, dust and pollution risks. The widespread, and apparently legally required, fencing of roads is likely to reduce connectivity (IUCN, 2013, Castillo – Sánchez, 1999).
While earlier plans for transmission lines along the coast were abandoned to conserve the visual integrity of the area, a major transmission infrastructure project is proceeding in parallel to Route 2 and the international border. It will connect the two Mexican States on the Baja California Peninsula with the Mexican power grid (IUCN, 2013).

► Other Ecosystem Modifications, Dams/ Water Management or Use

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

Although the Reserve covers a large area, it has only a few small scattered settlements, and around 200 permanent residents. Settlements are concentrated in the buffer zone`s northeast region, near the town of Sonoyta, primarily along Highways 2 and 8 (Brusca et al. 2001). Increasing consumption from households and commercial agriculture in the wider ecosystem on both sides of the border threatens the long-term integrity of the property (Ganster, 1996; Hume, 2000; Mumme, 2000; Moya et al., 2011). Surface water (in particular the Sonoyta River) and groundwater are scarce and of utmost ecological importance in and around EPGDABR. The increasing pressure from pollution and overuse on both sides of the border in the broader region is likely to have long-term impacts on the entire Sonoran Desert (IUCN, 201).
The Colorado River Delta is located just west of the Altar Desert. The huge

Colorado River system has been massively transformed and overused to the point that hardly any of its water reaches the Gulf of California. This clearly constitutes a major ecosystem modification of an area that has intricate geological and ecological linkages to the property and the adjacent Gulf (Chester, 2006; Hume, 2000; IUCN, 2011.
The Sonoyta River is known to suffer from pollution, mostly from industrial agriculture in the United States of America and sewage from the border town of Sonoyta (Mumme, 2002; Sistema de Areas Naturales Protegidas del Estado de Sonora (SANPES), 1994).

► Tourism/ visitors/ recreation

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

In terms of infrastructure for visitors, the Reserve has among the most outstanding facilities of all Mexico`s federal reserves, at the Centro de Visitantes Shuck Toak (http://elpinacate.conanp.gob.mx/centro_de_visitantes.php), as well as a biological station.

Visitors to the center and the Reserve have augmented significantly over the last 20 years, from 3000 in 1997 to about 25,000 in recent years. However, these figures are far from the estimated 120,000 visitors the Reserve has capacity to house.

While harsh conditions set natural limits to tourism numbers, there are a number of concerns. Tourists for example may engage in illegal extraction of plants and animals and there are indirect concerns related to water consumption in the nearby coastal tourism resort (World Heritage nomination dossier of the property).
Mainstream tourism takes place around the visitor centre and is restricted to its surroundings. Possible risks associated with tourists and scientists entering the property include unintended introductions of alien invasive species. Official and unofficial off-road rallies through the dunes of the Altar Desert are a concern. This sort of threat is growing and race organizers are looking more and more seriously on organized off road races, mainly along the western and southern edge of the reserve. They take place in areas that are very difficult to control conventionally. Indirect impacts of tourism are

related to water consumption in the arid area and disturbance from increased traffic, in particular on the axis connecting the coast to neighbouring Arizona in the United States of America (IUCN, 2013; Burquez y Martinez-Yrizar, 2006).

► Invasive Non-Native/ Alien Species

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

Seven non-natives have become invasive species that pose serious threats to the native ecosystems: red brome (Bromus rubens), buffelgrass (Cenchrus ciliaris), fountain grass (C. setaceus), Arabian and Mediterranean grasses (Schismus arabicus, S. barbatus), Sahara mustard (Brassica tournefortii), and tamarisk (Tamarix chinensis) (Felger et al. 2013).

One of the most widespread and serious threats to the Reserve, and to the entire Sonoran Desert ecoregion, is buffelgrass, an invasive exotic forage introduced on ranches throughout northern Mexico starting in the 1950s. Buffelgrass pastures are expanding especially quickly across the desert rangelands of Sonora, where since the early 1970s, nearly one million hectares of desert scrub have been cleared, tilled, and sown with buffelgrass to create cattle pastures (Brenner and Kanda 2013).

Buffelgrass has been transforming large parts of the Sonoran Desert (Búrquez and Martínez, 2006).

In addition to plants, at least 5-10 mammals, 2 amphibians, 50-60 fishes, and several reptiles have been introduced in the region (Felger et al. 2013). Known impacts mostly stem from feral livestock, competing with native species, disseminating non-native plants and raising concerns about wildlife diseases spread at waterholes (IUCN, 2013, Avila-Jiménez, 2005; Hayden, 1998).

Potential Threats

High Threat

While there is no current indication of dramatic impacts of Alien Invasive Species, the experience from other parts of the Sonoran Desert is alarming.

Likewise, climate change may affect the delicate and highly particular microclimate with potentially major effects on water availability and thus most forms of life. The same can be said if mining activities are indeed permitted.

► Invasive Non-Native/ Alien Species

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

Complex risks both from various plants and from feral livestock could lead to major ecosystem transformation as observable in other parts of the Sonoran Desert (see above). This is a threat that needs to be closely monitored, taken into account, among other, that tourism (and the associated risk of introduction of new invasive species) has been augmenting greatly in the Reserve in recent years.

► Desertification

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

Water quantity and distribution patterns are critical factor for the biodiversity of the Sonoran Desert. Anticipated climate change may affect some of the ecological particularities of the property (IUCN, 2013; Villers-Ruiz et al., 1998). Recent research on lizards of the genus Sceloporus showed that 12% of 200 Mexican populations have become locally extinct since 1975 as result warming environmental temperatures (Sivervo et al. 2010).

For instance, Goode’s horned lizard (Phrynosoma goodei) might be severely threatened by combined forces of climatic and landscape change (Lara-Resendiz et al. 2014).

► Fire/ Fire Suppression

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

Wildfire is a well-documented key challenge elsewhere in the Sonoran Desert. The deliberate introduction of non-native grasses has increased fuel loads, triggering a process of gradual conversion of huge tracts of the

Sonoran Desert into grasslands, as native systems lack major adaptations to fire. Effects on native flora are disastrous. So far EPGDABR has no major areas of introduced grasses. However, non-native grasses continue to be promoted in Mexico so the increase of infestation and a related increase in fire events is a potential future scenario for the property (Avila-Jiménez, 2005).

► Volcanoes

Very Low Threat
Inside site
Outside site

Although volcanic activity is dormant, the mean recurrence interval of eruptions is becoming better known and suggests that this interval is significantly shorter than the time that has elapsed since the last known eruption (Gutman et al. 2000; Gutman 2011)

► Oil/ Gas exploration/development

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

A recent study (Armendariz-Villegas et al. 2015) found that 10,804 ha (1.51%) of the total 714, 557 ha of El Pinacate & Gran Desierto de Altar Biosphere Reserve overlap with 15 mining concessions, 50% of which are reported as exploitation, 40% as exploration and data are not available for the remaining 10%. These are cause of concern and any potential mining plan should be closely monitored given the potential serious impact on the fauna and flora they might bring about.

Also, information provided (August 2017, personal communication) by former CONANP Reserve`s staff indicate that there are plans for salt mining in or near the Reserve`s buffer zone. In March 2017, an environmental impact assessment was submitted to the Ministry of Environment (SEMARNAT) by a private company but was not approved by CONANP. However, it seems the project is still being pursued.

Protection and management

Assessing Protection and Management

▶ Relationships with local people

Some Concern

The property seems locally widely accepted. However, tensions have escalated between authorities and owners of land within the property (ejidos). Very recently, people from 7 ejidos who own land inside the Reserves`s core zone had become more discontent, arguing that the restrictions imposed by the Reserve don’t allow them to continue with their business activities. They claim that, since the land own by those ejidos was not expropriated - and thus they did not receive any payment in compensation from the government at the time, as other ejidos did – they should now be financially compensated. CONANP supported preparation of a “master plan” to address those grievances and are trying to find solutions. Recently, people from those ejidos temporality seized the offices of the Centro de Visitantes in protest. The lack of local employment forces residents to search for work in the nearby cities (Puerto Peñasco, Sonoyta and San Luis Río Colorado) and basic services health, education and recreation) are generally lacking. It is important that alternatives be explored to address the ejido`s discontent (IUCN Consultation, 2017).

▶ Legal framework

Mostly Effective

The legislation appears adequate.

▶ Enforcement

Some Concern

Enforcement is hindered by the lack of staff and financial resources. Also, drug-related activities and insecurity in the region could deter tourists or even staff to visit or move within the Reserve.

▶ Integration into regional and national planning systems

Some Concern

Overall satisfactory with opportunities to coordinate even more closely with adjacent coastal areas and protected areas. The regional level also has a transboundary dimension in this case. Despite longstanding and functional relationships at the working level, there is room for in the bi-national ecosystem of the Sonoran Desert (IUCN, 2013; Castillo – Sánchez, C. 1999; Chester, 2006; Ganster, 1996; Morehouse et al., 2008; Salazar, n.d.).

► Management system

Serious Concern

There are two areas for concern to properly manage a Reserve of this size. The most urgent one deals with the number of staff. After the Reserve`s (CONANP) Director left in February 2017, the post has been vacant (IUCN Consultation, 2017). Further, there are only 6 staff members for the whole Reserve, and 2 of them are paid by a local NGO. Second, there is lack of sufficient financial resources. In 2016, due to overall cuts,

in Mexico`s federal government programs, the annual budget for the Reserve was downsized in more than half (to only 400,000 pesos). There is no available information on the 2017 budget. One of the items the Reserve most urgently need are vehicles.

► Management effectiveness

Some Concern

The National Commission on Natural Protected Areas (CONANP) has finalized or is finalizing a thoughtful evaluation of the effectiveness of all or most federal protected areas, through its Sistema de Informacion, Monitoreo y Evaluacion para la Conservacion (SIMEC, https://simec.conanp.gob.mx/evaluacion). However, that information has not became publicly available as of 31 August 2017. However, the issues outlined above (lack of resources and staff) certainly have negative impacts on the management effectiveness.

► Implementation of Committee decisions and recommendations

Highly Effective

Given the recent inscription (2013) it would be immature to suggest any non-

compliance. It is also important to note that the one and only Committee decision referring to EPGDABR at the time of preparing this assessment contains only one request whereas all other points are recommendations. The former is a request to ensure full compliance with Environmental Impact Assessment requirements as regards the ongoing expansion of Route 2. The latter include encouragement to (i) expand the property to include the adjacent Ramsar site of Bahia de Adair; (ii) strengthen cooperation with the United States of America in the Greater Sonoran Desert Ecosystem; (iii) further cooperate on the saving of the Sonoran Pronghorn from possible extinction; (iv) consider environmental concerns in security efforts along the international border. In all cases, follow-up seems highly desirable (whc.unesco.org).

► Boundaries

Some Concern

As recommended by the Committee, it is conspicuous that the property does not extend to the nearby Adair Bay, a formally protected area which is also a Ramsar site. This would add complementary and highly valuable areas, thereby covering the full mosaic and altitudinal gradient of the area. The buffer zones are, in accordance with Mexican legislation, formally protected and plausible in their design (IUCN, 2013). Greater protection of the area could be afforded by the inclusion of the extensive dune fields west of the western boundaries of the reserve, as far as to limit with the neighbouring Reserva de la Biosfera del Alto Golfo de California y delta del rio Colorado.

► Sustainable finance

Serious Concern

This is an area of serious concern. The Reserve needs sufficient and predictable funds to increase and maintain its staff, as well as for its operation (see above).
On the other hand, the operation of the Centro de Visitantes seems to be well financed with funds from FANP (Fondo para Areas Protegidas), co-managed by Fondo Mexicano para la Conservacion and CONANP.

► Staff training and development

Serious Concern

This is an area of serious concern. The Reserve needs sufficient and predictable funds to increase and maintain its staff, as well as for its operation (see above).
On the other hand, the operation of the Centro de Visitantes seems to be well financed with funds from FANP (Fondo para Areas Protegidas), co-managed by Fondo Mexicano para la Conservacion and CONANP.
Staff are well-qualified and frequent cooperation with academic and civil society partners exposes staff to scientific information and management ideas. Future staff development prospects will depend on continuing and ideally increasing funding levels (IUCN, 2013).

► Sustainable use

Mostly Effective

Sustainable use is restricted to tourism (Nomination dossier for the property).

► Education and interpretation programs

Mostly Effective

There is an exemplary Centro de Visitantes named Shuk Toak attracting increasing numbers of domestic and international visitors. Original interpretive pull-outs along the coast roads require better maintenance. The web site, both of the Reserve and the Centro de Visitantes, need much improvement so as to offer enough and up-to-date information to visitors.

► Tourism and visitation management

Mostly Effective

Further investment could be used to consolidate interpretation opportunities in the various field stations along main roads, in particular if the number of visitors continues to grow.

► Monitoring

Some Concern

At the time of the IUCN field evaluation, not all field stations, located at strategic entry points along main roads, were operational. The vast area with limited road infrastructure presents important logistical challenges. There is

an urgent need for vehicles so that staff can properly survey key sites within the Reserve. The understandable focus on monitoring of the expansion of Route 2 comes at the expense of limited monitoring of other areas (IUCN, 2013).

► Research

Mostly Effective

There is a long history of research from various disciplines carried out mostly by Mexican and American scientists. Despite good personal relationships, not all of the research products are made available to park management. Results are available in English language and Spanish. Those results need to be available to both scientists and visitors through the Reserve and Centro de Visitantes web sites.

Overall assessment of protection and management

Some Concern

The current management efforts constitute a vast and continuous improvement compared to the early days when a first and much smaller protected area was designated. However, a number of concerns exist, particularly with regards to human and financial resources, also affected by the recent overall budget cuts in Mexico’s federal government programmes, which raises questions about the longer term capacity. Efforts should be soon implemented to address staff issues, in particular the appointment of a Director and increasing the number of personnel; as well as to ensure proper and sustainable funding to operate and manage the Reserve. Conflicts with the ejidos should be soon resolved in a way that is fair to those land owners and ensure their long-term support to the Reserve.

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

Some Concern

As mentioned above, management can be compounded by the lack of a Director, sufficient staff, vehicles and sufficient/predictable financial resources. This is also important in view of the recent conflicts with the land-

owners (ejidos).

Park management is struggling to have a strong voice in other public sectors, namely road construction. The compliance with requirements defined in Environmental Impact Assessments is not always secured despite frequent complaints on the part of park management, indicating a relatively weak position. Working relationships with neighboring Mexican protected areas appear to be functional. The transboundary conservation dimension in the shared ecosystem appears to have been compromised by border security issues (IUCN. 2013; Nomination dossier).

► Best practice examples

The visitor centre Schuk Toak (the local indigenous name of the Pinacate Range) is a best practice example of an attractive and well-designed visitor centre enabling visitors to learn about the fragile and inhospitable desert environment and its original inhabitants.

State and trend of values

Assessing the current state and trend of values

World Heritage values

► Extraordinary landscape beauty

Low Concern
Trend:Stable

Overall, the visual integrity remains intact despite inevitable impacts of expanding road and energy transmission infrastructure (IUCN, 2013).

► Extraordinary volcanic and geological features

Low Concern
Trend:Improving

There are important past improvements and no factors which are likely to alter or impact on these values. A small part of the volcanic field extends into the neighboring state of Arizona in the United States of America. While also

formally protected there, there are concerns about the impacts of recent increases in border security efforts (Castillo – Sánchez, C. 1999; Chester, 2006; Ganster, 1996; Morehouse et al., 2008; Salazar, n.d.).

► Scientific importance of volcanic and geological features

Good
Trend:Stable

Diverse research is ongoing, permanently adding to the wealth of available information and knowledge (e.g. Hayden, 1998; Gutmann 2008, 2011). Efforts should be made to share this information and knowledge among both Mexican scientists/managers and visitors from Mexico and the US

► Rare, endangered and endemic species of flora and fauna

Low Concern
Trend:Stable

Despite multiple threats, flora and fauna do not appear to be under acute threat. However, the Sonoran Pronghorn continues to face an uncertain future. The site plays a role in that future but on its own cannot secure it (e.g. Castillo – Sánchez, C. 1999; Moya, 2011). Populations of several other species of concern, in particular the flat-tail horned lizard, the Yuma fringe-toed lizard, the Sonoyta pupfish, the Sonoyta mud turtle, the lesser long-nose and fish-eating bats, and Goode’s horned lizard, should be closely monitored.

► Scientific importance (desert ecology and biology)

Low Concern
Trend:Stable

The extraordinary value as a rare baseline reference of a large-scale intact area within the Sonoran Desert is only partially taken advantage of (Goudie et al., 2011).

Summary of the Values

► Assessment of the current state and trend of World Heritage values

Low Concern

Trend: Stable

The visual integrity remains intact despite inevitable impacts of expanding road and energy transmission infrastructure. There are no factors which are likely to alter or impact on the geological values of the site. Despite multiple threats, flora and fauna do not appear to be under acute threat. However, the Sonoran Pronghorn continues to face an uncertain future. Populations of the flat-tail horned lizard, the Yuma fringe-toed lizard, the Sonoyta pupfish, the Sonoyta mud turtle, the lesser long-nose and fish-eating bats, and Goode’s horned lizard, should be evaluated and monitored. Overall, despite ongoing threats and management challenges, important improvements make EPGDABR a conservation success story.

Additional information

Benefits

Understanding Benefits

► Tourism-related income

The local economy is largely dependent on fisheries and tourism. The diversification of the touristic offer beyond beach tourism and sports fishing seems most promising, although the lack of local employment is forcing residents to search for work in the nearby cities of Puerto Peñasco, Sonoyta, and San Luis Río Colorado. The growth in the number of visitors offer important opportunities, both to raise funds for the Reserve from tourist fees and to engage the ejidos on ecotourism. The latter would be important as to offer new and predictable sources of employment to land owners. The well-equipped Centro de Visitantes and the biological station offer a great potential to attract visitors from both Mexico and the US, as well as for educational purposes for schools and universities on both sides of the border.

► Wilderness and iconic features

The property is widely recognized as the "heart of the Sonoran Desert" on

both sides of the border.

▶ Sacred natural sites or landscapes

What is today the World Heritage property continues to be a key sacred site of major spiritual importance to indigenous peoples on both sides of the border. Numerous ancient trails, sleeping circles and artifacts illustrate that the area was used and inhabited for centuries and possibly millennia. The Tohono O' odham regard the Sierra El Pinacate not only as part of their native homeland but their place of origin and a spiritual center. The cultural history of the region is also rich and provides insight into our understanding of the early occupation of the American continent. The Pinacate region has long been a spiritual and cultural site for the modern Tohono O’odham (“Papago”) people (Brusca et al. 2001).

▶ Importance for research

Outstanding record of and opportunities for research on a broad range of geological and volcanic features and phenomena and baseline reference for the understanding of the ecology of the Sonoran Desert, including on how its fauna and flora respond to climate change.

Summary of benefits

The property is an important source of inspiration for traditional communities and visitors alike. A rare scientific reference area for many disciplines, the property also has a strong potential to further promote forms of tourism that are adapted to the fragile desert environment. It also offers an important platform to educate children and youth on nature and conservation on both sides of the border, thus promoting a share sense of responsibility and cooperation between Mexico and the USA.

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects

1	United States National Park Service (USNPS)	Cooperation between EPGDABR and adjacent protected areas in the United States of America, in particular provision of equipment for field monitoring.
2	International Cooperation	Exchange with Los Cardones National Park, Argentina.
3	Various academic and NGO partners	Various research projects, such as monitoring of various species. Scientific research is carried out within the reserve.

Compilation of potential site needs

№	Site need title	Brief description of potential site needs	Support needed for following years
1	Sonoran Pronghorn conservation	The conservation efforts for the Sonoran Pronghorn appear to require even better coordination. The role of EPGDABR could be consolidated within such a broader and coordinated approach.	
2	Increased transboundary cooperation and coordination	Transboundary cooperation has conservation benefits in any shared ecosystem divided by an international border. It can be argued that the need for better cooperation is ever more important given the impacts of recent investments in surveillance and physical barriers on the United States of America side of the border, including within contiguous protected areas. Improvement of sharing of information by US scientist with their counterparts in Mexico would benefit both, as well as reinforce capacities to better manage the reserve and address its challenges.	
3	Private land within the property	The remaining ejidos, a Mexican form of communal land tenure, within the property are the legacy of a questionable land reform which distributed land to establish agriculture and ranching. The expectations were met with little success when irrigation attempts proved costly and resulted in soil salinization. Governmental purchasing of the land could bring the longstanding and sometimes conflictive discussion to a conclusion. Such action is unlikely to result in major conflicts due to the low value of the land and given the use restrictions in a federal protected area. Such purchasing would reverse what can only be described as a historic error.	

№	Site need title	Brief description of potential site needs	Support needed for following years
4	Involvement of indigenous representatives in sensitive areas	Mapping of sacred sites and displaying sites in publicly accessible maps and documents can be highly sensitive. There are current efforts to better understand native toponomy, considering sensitive locations. Touristic and scientific access to archaeological sites should be determined in consultation with indigenous peoples.	

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