CRITICAL ECOSYSTEM PARTNERSHIP FUND

Ecosystem Profile

Mountains of Central Asia Biodiversity Hotspot

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ABOUT THE CRITICAL ECOSYSTEM PARTNERSHIP FUND

The Critical Ecosystem Partnership Fund (CEPF) empowers people to be good stewards of the planet, so they and future generations continue to benefit from its life-sustaining resources, such as clean air, fresh water, a stable climate and healthy soils. The Fund is a joint program of l'Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility, the Government of Japan, the MacArthur Foundation and the World Bank. The partners believe that civil society is uniquely positioned to protect some of Earth's most biologically rich yet threatened ecosystems.

CEPF provides grants to nongovernmental and private sector organizations, communities and individuals so they can conserve these critical ecosystems, located in biodiversity hotspots. The investments are even more meaningful because these regions are home to millions of people who are impoverished and highly dependent on natural resources.

Enabling civil society groups to have stronger voices and exert greater influence in the world around them is the hallmark of our approach. Our grantee partners range from small farming cooperatives and community associations to private sector partners, and national and international nongovernmental organizations.

CEPF grants:

- Target biodiversity hotspots in developing and transitional countries, and address many of the "Aichi" targets—the 20 goals set by the countries that are parties to the Convention on Biological Diversity to guide global efforts to save biodiversity and improve human well-being through 2020.

- Are guided by regional investment strategies — ecosystem profiles — developed with local stakeholders.

- Go directly to civil society groups to build this vital constituency for conservation alongside governmental partners. Grants are awarded on a competitive basis to implement the conservation strategy developed in each ecosystem profile.

- Create working alliances among diverse groups, combining unique capacities and eliminating duplication of efforts.

- Achieve results through an ever-expanding network of partners working together toward shared goals.

To date, CEPF has supported more than 2,020 civil society groups and individuals in more than 92 countries and territories.

EXECUTIVE SUMMARY

Biodiversity and the threats to it are not distributed evenly over the face of the globe. Conservation organizations can maximize the effectiveness of their limited funds by focusing on the places that are most important and where action is most urgent. Thirty-six biodiversity hotspots, defined as regions that have at least 1,500 endemic plants species and have lost more than 70 percent of their natural habitat, have been identified globally. They cover only 2.3 percent of the Earth's surface but contain a disproportionately high number of species, many of which are threatened with extinction. Hotspots, therefore, are global priorities for conservation.

The Mountains of Central Asia Biodiversity Hotspot consists of two of Asia's major mountain ranges, the Pamir and the Tien Shan. The hotspot's 860,000 square kilometers include parts of seven countries: southeastern Kazakhstan, most of Kyrgyzstan and Tajikistan, eastern Uzbekistan, western China, northeastern Afghanistan, and a small mountainous part of southeastern Turkmenistan. In addition to 1,500 endemic plant species, the region is home to 53 endemic species of mammal, bird, reptile, amphibian, and freshwater fish. That is, as endemics, they occur nowhere else in the world. Further, of the approximately 6,700 species occurring in the hotspot, 68 are classified by the International Union for Conservation of Nature as globally threatened.

The region is home to about 64 million people and is undergoing dramatic change that places increased stress on the scarce habitat that protects threatened species. Economic growth and increased connections in trade and transport, on the one hand, and economic downturns and local instability, on the other, force people and their representatives into making short-term decisions on the use of land and water, or into allocating limited financial resources for their protection. That being said, the region has a large and historical estate of formally protected areas and a tradition of conservation built around respect for natural resources and cultural identification with iconic species.

To increase the chance of success, it is important that actions supported by CEPF complement existing strategies and programs of national governments, donors and other stakeholders. To this end, before starting a grant-making program, CEPF works with local stakeholders to develop an ecosystem profile for the hotspot. The profile describes the important species and sites, as well as the threats, opportunities and actions that are already being taken for conservation in the region, enabling CEPF to identify priority sites, species, and themes to support.

The ecosystem profile for the Mountains of Central Asia was developed between May 2016 and March 2017, through a process that involved the participation of more than 250 people representing government and non-government organizations from all seven countries. The profile lists the 68 species in the Mountains of Central Asia that are classified by IUCN as globally threatened. For most species, the key to conservation is protection of adequate areas of appropriate habitat. The profile, therefore, identifies 167 important sites, known as Key Biodiversity Areas (KBAs), where species and ecosystems of elevated conservation concern are known to occur.

In some cases, the protection of discrete areas of habitat in a KBA may not ensure the survival of a species, especially where the species ranges widely over the landscape or occurs at a very low density. This is especially important for species that may move over large areas during their life cycles. To accommodate this, 26 corridors are also identified. These large areas play a vital role in ensuring connectivity between KBAs. In doing so, they also play an important role in ecosystem functions important for human livelihoods, such as by protecting water supplies.

CEPF Niche and Investment Priorities

The identification of conservation outcomes in Chapter 4 of the Ecosystem Profile constitutes a long-term, overarching agenda for conservation of the region's unique and valuable biodiversity. Only a fraction of these priorities can be tackled by civil society organizations over the next five years with CEPF support. The Ecosystem Profile therefore identifies CEPF's niche (Chapter 11); namely, to support a diversity of civil society organizations with varying levels of capacity to achieve conservation outcomes and environmental sustainability within the increasingly important national agendas of economic growth. Building from the niche, the profile identifies biogeographic and thematic priorities for support, summarized here and described in detail in Chapter 12.

The Profile identifies 33 priority species, 28 priority sites, and five priority corridors around which CEPF will apply six Strategic Directions, each broken down into Investment Priorities. These Strategic Directgions, summarized in the table below and describedin detail in Chapter 12, form the heart of CEPF's plans for grant-making in the Mountains of Central Asia Biodiversity Hotspot.

CEPF Strategic Directions	CEPF Investment Priorities
1. Address threats to priority species	1.1. Improve enforcement and develop incentives and alternatives for nature users and collectors 1.2. Promote improved regulation of collecting, hunting, and fishing 1.3. Support the development of species-specific reserves and conservation programs 1.4. Prevent human-wildlife conflict by addressing killing, poisoning, and trapping 1.5. Maintain populations of priority species beyond those solely affected by collection, hunting, fishing, poisoning, and nature users
2. Improve management of priority sites with and without official protection status	2.1. Facilitate effective collaboration among CSOs, local communities, and park management units to enhance protected area networks 2.2. Develop and implement management approaches to sustainable use in KBAs outside official protected areas 2.3. Build support and develop capacity for identification and recognition of KBAs

CEPF Strategic Directions	CEPF Investment Priorities
3. Support sustainable management and biodiversity conservation within priority corridors	3.1. Develop protocols and demonstration projects for ecological restoration that improve the biodiversity performance and connectivity of KBAs 3.2. Evaluate and integrate biodiversity and ecosystem service values into land-use and development planning 3.3. Support civil society efforts to analyze development plans and programs, evaluate their impact on biodiversity, communities and livelihoods, and propose alternative scenarios and appropriate mitigating measures
4. Engage communities of interest and economic sectors, including the private sector, in improved management of production landscapes (i.e. priority sites and corridors that are not formally protected)	4.1. Engage hunting associations, tourism operators, and mining companies in conservation management and establishing valuation mechanisms for biodiversity and ecosystem services 4.2. Promote mainstreaming of conservation into livestock and farm management practices 4.3. Promote sustainable forest certification and value chains for non-timber forests products 4.4. Engage with the government and private sector to incorporate site safeguards into infrastructure development 4.5. Engage the media as a tool to increase awareness about globally threatened species and KBAs and inform public debate of conservation issues
5. Enhance civil society capacity for effective conservation action	5.1. Enable and enhance communication and collaboration between civil society and communities and government agencies responsible for implementing national biodiversity strategies 5.2. Enhance civil society organizations capacity for planning, implementation, outreach, sharing of best practice, fundraising, and communication 5.3. Catalyze networking and collaboration among CSOs and between CSOs and public sector partners 5.4. Promote greater sources of funding for civil society to become engaged in conservation action 5.5 Support action-oriented environmental education

CEPF Strategic Directions	CEPF Investment Priorities
6. Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team	6.1. Build a constituency of civil society groups working across institutional and political boundaries toward achieving the shared conservation goals described in the ecosystem profile 6.2. Act as a liaison unit for relevant networks throughout the hotspot to harmonize investments and direct new funding to priority issues and sites

1. INTRODUCTION

The Mountains of Central Asia are a biodiversity hotspot to be understood in terms of conservation, but the region must first be considered from a political and cultural perspective. Within the region, "Central Asia" is typically understood to mean the whole of the five former Soviet republics: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. In the past, from the perspective of Central Asia, China's Xinjiang Uyghur Autonomous Region – which borders three of the five former republics – and Afghanistan were "hinterland," far from the main economic centers and transport hubs. Today, however, with intensifying investments in trade and infrastructure, and with greater movement of people and knowledge, it makes increasing sense to understand the region in terms of at least parts of seven countries.

Central Asia has a long history as a crossroads between East and West. In the past, it was home to the great commercial and cultural centers of the Silk Road. Today, the modern equivalents include China's Belt and Road initiative (BRI) and the ten-country Economic Cooperation Organization (ECO) stretching from China's borders to the Indian Ocian and Caspian and Mediterranean Seas.

For centuries, the region was a major contributor to the arts, sciences, medicine, and trade. With the mixing of agrarian, nomadic, and industrial societies, it is a mosaic of cultures, languages, and political systems. Moreover, only 25 years ago, five of the countries -- Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan – were part of the Soviet Union, which has added a further layer of complexity and interest to the region.

After the break-up of the Soviet Union in 1991-1992, Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan joined the Commonwealth of Independent States (CIS), and Turkmenistan took an official observer status with a policy of neutrality. Cooperation among these five countries supports environmental protection and hydrometeorological monitoring. New cooperation forums in the region – including the Shanghai Cooperation Organization (SCO), the Eurasian Economic Union (EEU), the Custom Union (CU), and the afore-mentioned ECO and Belt and Road – further integrate these countries. These economic unions are driving infrastructure and development in a way that may have massive impacts on the environment.

Conflict and unrest have also been a reality in the region, as each of the former republics transitioned to new forms of government, and as different groups in have sought greater prosperity or self-determination. Difficult topography, remote geography, and ethnic divisions have been and remain a challenge. Afghanistan, in particular, has suffered from more than thirty years of conflict, and the current Islamic Republic is now trying to establish effective governance and security outside the main urban areas. Tajikistan's civil war in 1992 was started, in part, due to a power struggle between groups from the eastern, southern, and central parts of the country. In Kyrgyzstan, political power centers are split to the east and west as well as north and south. Moreover, due to a policy of decentralization, local community "jamaats" can challenge decisions at the national level and apply they own rules, including to natural resources.

Much of the biodiversity and natural ecosystems are in the remote mountain regions, and ridges themselves form many of the international borders. As a result, many protected areas or key biodiversity areas sit across borders from one another, raising a question of bilateral or regional cooperation. Such cooperation existed within the five former republics during the Soviet era, and

attempts have been made more recentlythrough the cross-border Western Tien Shan, Pamir-Alai conservation, and snow leopard landscape conservation initiatives.

Several initiatives are taking a wider approach to address regional conservation issues. A Global Mountain Summit held in Kyrgyzstan in 2002 explored united approaches for mountain development. A Global Snow Leopard Summit in 2013 resulted in the establishment of the Global Snow Leopard and Ecosystem Protection Program (GSLEP). GSLEP is active in 12 countries, including all of the hotspot countries other than Turkmenistan.

Several international donors and partners are actively involved in conservation in the region. The Global Environment Facility (GEF), the European Union, and the governments of China, Japan, Germany, Switzerland, Finland, Norway, Russia, China, Korea and the United States support programs on sustainable natural resource use and environmental projects. Private funds and charities are supporting sustainable development and conservation initiatives, as well.

Civil society organizations (CSOs) are in a unique position to influence people's choices, habits and behavior because they are based in or work with communities. Unlike governments, CSOs have no power to compel people to change. Instead, they influence behavior of stakeholders through education, incentives, demonstration of best practice, and direct assistance. Several major international environmental NGOs are active in the region, including World Wide Fund for Nature (WWF), Wildlife Conservation Society (WCS), Fauna & Flora International (FFI), and BirdLife International and its network partners, and to varying degrees, local CSOs are, or are in a position to become, active in conservation.

Biodiversity and the threats to it are not distributed evenly over the planet, biodiversity hotspot or a country. Conservation organizations can maximize the effectiveness of their limited funds by focusing on the places that are the most important and where action is most urgent. The Critical Ecosystem Partnership Fund (CEPF) is designed to safeguard the world's biologically richest and most threatened regions, known as biodiversity hotspots. One of the most influential priority setting analyses was the identification of biodiversity hotspots (Myers *et al.* 2000; Mittermeier *et al.* 2004), defined as regions that have at least 1,500 endemic plants species and have lost at least 70 percent of their natural habitat. There are 36 hotspots globally, covering 15.7 percent of the earth's surface. The intact natural habitats within these hotspots cover only 2.3 percent of the world's surface, but contain a disproportionately high number of species, many of which are threatened with extinction. Hotspots, therefore, are global priorities for conservation.

The Mountains of Central Asia hotspot consists of two of Asia's major mountain ranges, the Pamir and the Tien Shan. The hotspot's 860,000 square kilometers include parts of seven countries: southeastern Kazakhstan, most of Kyrgyzstan and Tajikistan, eastern Uzbekistan, western China, northeastern Afghanistan, and a small mountainous part of southeastern Turkmenistan. Hotspot delineation is based on the Global 200 eco-regions (Olson, D. M. and Dinerstein, E., 2002[1]), with some adjustments that reflect the administrative and geographic features of the region. With a relatively large amount of remaining natural habitat, high endemism, and increasing threats, the region is important for investment by CEPF.

[1] http://wwf.panda.org/about_our_earth/ecoregions/ecoregion_list/

Figure 1.1. Global Biodiversity Hotspots Map and CEPF Investments

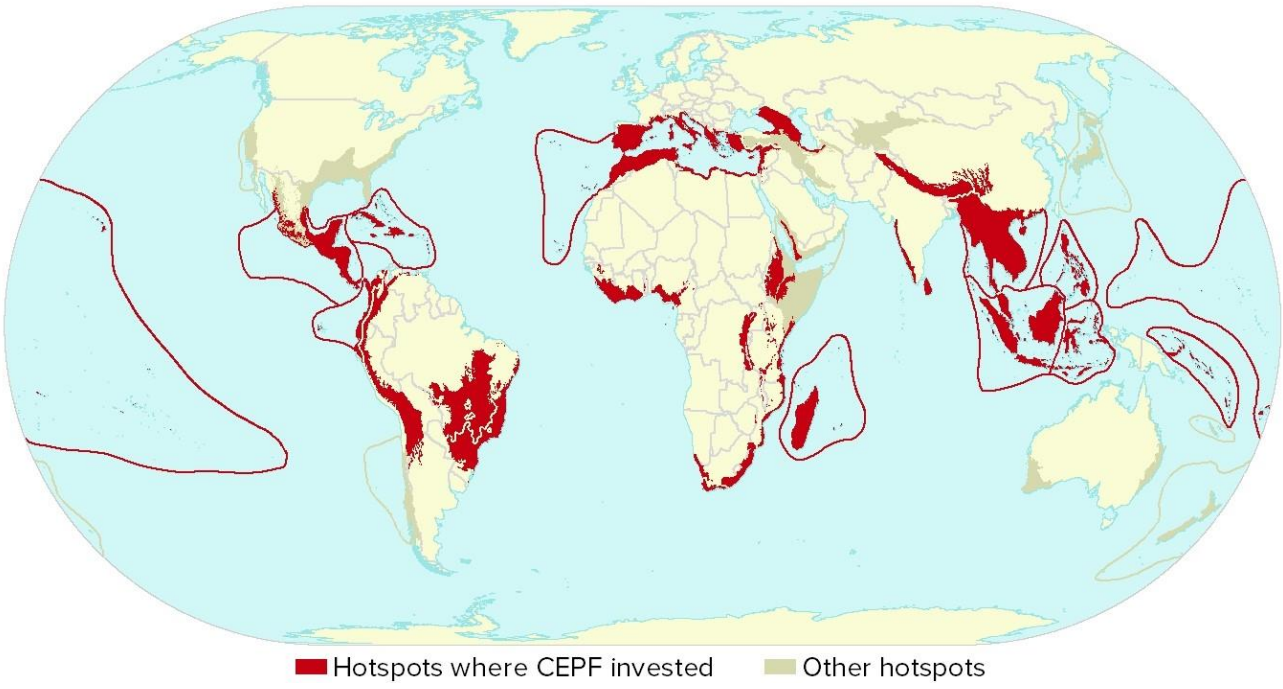


Figure 1.2. Map of Mountains of Central Asia Hotspot

2. BACKGROUND

CEPF develops Ecosystem Profiles to identify an investment strategy for each hotspot. Ecosystem Profiles are prepared by subject matter and regional experts in consultation with a large number of national stakeholders to ensure that the final product is locally "owned" and then used as a guide for action not just by CEPF and its grantees, but by the larger civil society, government, and donor communities. Ecosystem Profiles reflect a rapid assessment of biological priorities and the underlying causes of biodiversity loss. The profile couples these two elements with an analysis of conservation investments within the hotspot and other key information to identify CEPF's "niche for investment;" that is a statement of how CEPF funding can provide the greatest value.

Each Ecosystem Profile recommends broad strategic directions for investment into civil society-guided projects that contribute to biodiversity conservation. The Ecosystem Profile is designed to ensure that those investments complement other work, particularly that of host country national governments. CEPF promotes working alliances among community groups, nongovernmental organizations, academic institutions, the private sector, and the public sector to facilitate a comprehensive approach to conservation.

CEPF makes grants to civil society organizations, which CEPF defines broadly as organizations outside of government – NGOs, community groups, academic institutions, and business, trade, and social organizations. For CEPF, understanding the interests, capacity and needs of civil society is as important as understanding its biodiversity. Although CEPF makes grants to civil society, government plays a critical role in conservation and is always a partner in its efforts.

Over the period of May 2016 through March 2017, Zoï Environment Network of Geneva, Switzerland led and prepared the ecosystem profile with contributions from numerous national partners. The main activities of the process were:

- Definition of conservation outcomes
- Analysis of socioeconomic, policy, and civil society context of the hotspot
- Assessment of biodiversity threats and current conservation investments in the hotspot
- Consultation with a broad range of national and international stakeholders
- Formulation of a CEPF niche and investment strategy for the hotspot

This process engaged experts from numerous disciplines, as well as government agencies, nongovernmental organizations, donor organizations and other stakeholders. The profile team reviewed existing analyses from BirdLife's Important Bird and Biodiversity Areas (IBAs), WWF's ECONET for Central Asia, the IUCN Red list and national red lists, published books and atlases, reports and papers describing species and habitats in the mountains of Central Asia, as well as unpublished reports and publicly available information. The profiling has capitalized on priority-setting processes that have already taken place in several countries, such as National Biodiversity Strategies and Action Plans (NBSAPs), national protected areas strategies and expansion plans, and national biodiversity gap analyses. The profiling team analyzed up-to-date information on drivers and threats affecting biodiversity conservation in the hotspot, and current levels, geographies, and themes of conservation investments.

The profiling team began the process by formally notifying the GEF Operational Focal Points in each country of the work ahead. The team then conducted a desk review, began the process of identifying

key biodiversity areas (KBAs) with local and international scientists, and publicly sought the input of a diverse group of stakeholders. Because both CEPF and the KBA concept are new to Central Asia, the profile team designed and used cartoons as an accessible way for stakeholders to understand the purpose of the exercise.

The profiling team then presented its preliminary findings, particularly the lists of species, KBAs, and corridors (clusters of KBAs), in workshops with CSOs, government agencies, and other donors. Stakeholders helped refine and prioritize KBAs and investment priorities.

The team held formal meetings, government-attended meetings in four of the countries. While there were no formal meetings in Afghanistan, Turkmenistan, or Uzbekistan, stakeholders did travel from those countries to the other events and were also consulted directly by phone and electronic mail. In all, 256 unique participants attended the public meetings or were consulted directly (Table 2.2).

Table 2.1. Dates and Location of Stakeholder Consultations and Profile Presentation Events

Date	Location	Country Covered by Workshop	Participants
May 2016	Bern, Swiss GEF Constituency	Central Asia	20
June 2016	Astana	Kazakhstan	37
June 2016	Almaty	Kazakhstan	30
June 2016	Dushanbe	Tajikistan	33
June 2016	Tashkent	Uzbekistan (informal)	10
September 2016	Almaty	Kazakhstan	35
September 2016	Urumqi	China	25
October 2016	Bishkek	Kyrgyzstan	35
October 2016	Bishkek	Kyrgyzstan	48
October 2016	Dushanbe	Tajikistan and Afghanistan	42

Table 2.2. Contribution of Different Stakeholders to the Consultation Process

Country	CSOs	Private sector	Government	Research	Donor and int. org	Total
Afghanistan	2	2	2	2	2	10
China	4	4	2	8	4	22
Kazakhstan	25	7	17	6	4	59
Kyrgyzstan	40	4	5	6	4	59
Tajikisan	35	4	4	8	6	57
Turkmenistan	10	2	4	2	2	20
Uzbekistan	15	3	3	4	4	29
Total	**131**	**26**	**37**	**36**	**26**	**256**

Zoï posted draft data on species and sites, maps, and drafts of this document on its website and received about one hundred individual CSOs responses to a questionnaire about their capacity, needs, and suggestions for conservation of particular species or areas.

The final public event was a regional consultation in Almaty on 12 December 2016, International Mountain Day. This meeting brought together a cross-section of senior participants from previous

meetings, including representatives of GEF Focal Points, to finalize KBA priorities and the investment strategy.

Reflecting on the process, itself, of preparing this Ecosystem Profile, the team learned that while there are many gaps in data in publicly available records, there is an equal amount of information being held by the multiple stakeholder groups that participated in this effort. This Profile represents an important collation of this information. This profile was also the first time ever for the wide application the global KBA Standard (IUCN 2016), promoted by the KBA partnership.[2] Application of the standard was a challenge: different experts in each country took varying amounts of time to understand the standard; data quality, availability, and completeness varied across and within countries; the hotspot, itself, is large, with seven countries and documents and communication in English, Russian, Chinese, and Dari, at least; all with a limited budget of time and funds. In no way does this devalue the work here; rather, it says there is still more to be done.

[2] The KBA standard is described in IUCN (2016) *A Global Standard for the Identification of Key Biodiversity Areas.* The KBA partnership includes BirdLife International, IUCN, Amphibian Survival Alliance, Conservation International, CEPF, the GEF, Global Widlife Conservation, NatureServe, RSPB, WWF, and WCS.

3. BIOLOGICAL IMPORTANCE OF THE HOTSPOT

This chapter describes the geography, climate, and biological history of the hotspot; provides a summary of species diversity, levels of endemism, and global threat status among major taxonomic groups in the hotspot; and describes ecosystem services.

Mountain regions are crucial to the maintenance of the natural and agricultural global biodiversity. The vertical distribution of natural species by elevation results in a wide range of species and ecosystems spread over a relatively small surface area. Endemic species find homes in isolated islands of mountain habitat with characteristics conducive to unique life forms and varieties.

3.1. Geography, Climate, and History

The Mountains of Central Asia hotspot consists of two of Asia's major mountain ranges, the Pamir and the Tien Shan. The total area covered is about 860,000 square kilometers. The highest peak, Kongur, in the Chinese Pamir, rises to 7,719 meters, the lowest point is in the Turfan depression in China, 150 meters below sea level, and and some 20,000 glaciers cover between 25,000 - 35,000 km^2 (see Figure 3.1).

The mountains were mainly formed by folding due to tectonic movements during the Caledonian, Hercynian, and Alpine orogenic (or mountain-building) periods. Intense growth has occurred over the past 15-20 million years and continues today with strong earthquakes and active surface dynamics. The hotspot borders several major deserts, including the Taklamakan in China, the Kyzylkum in Uzbekistan, and the Karakum in Turkmenistan.

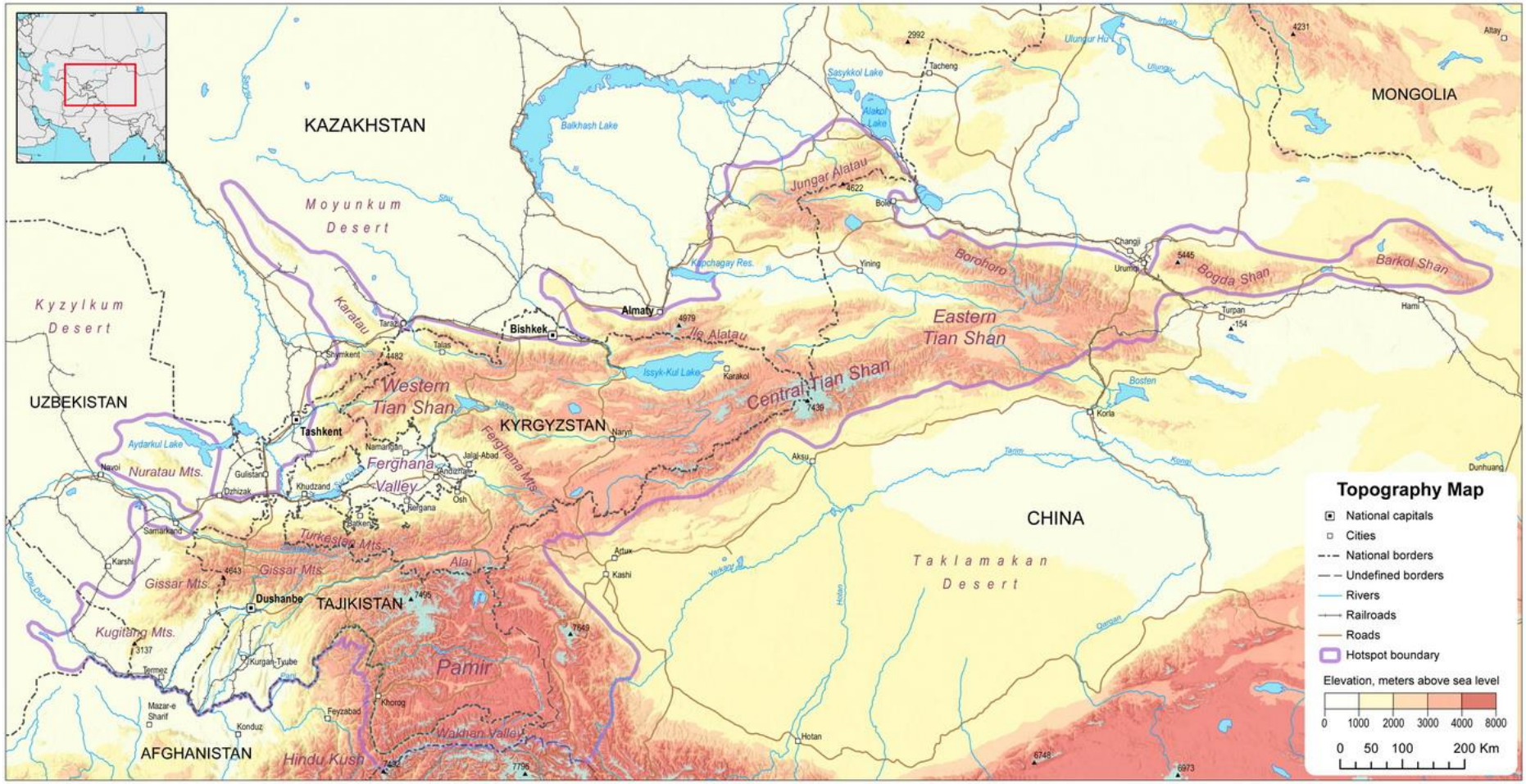
The Pamir was known to early Persian geographers as Bam-i-Dunya, or "roof of the world" and is situated at the center of several great ranges. The Tien Shan, or "celestial mountains," lie adjacent to the north, the Hindu Kush to the south, and the Karakoram and the Kun Lun Shan to the east.

The Pamir Mountains have a mean elevation of over 4,000 meters and its central parts are plateau-like in character. The western and eastern parts of the Pamir, in contrast, are characterized by sharp ridges and steep slopes cut by deep valleys and gorges. The Pamir includes the Fedchenko Glacier, which is more than 70 kilometers long and one of the longest non-polar glaciers in the world.

Several mountain ranges – the Alai, Hissar, Zeravshan and Turkestan – lie between the Pamir and the Ferghana Valley, a deeply downfaulted basin, about 300 kilometers long and 150 kilometers wide. The Ferghana Valley extends into Uzbekistan, Kyrgyzstan, and Tajikistan, and is the one of most densely populated and ethnically diverse regions of Central Asia, with a population density of 300-400 persons per square kilometer.

To the north of the Ferghana Valley, the Tien Shan Mountains extend for 2,500 kilometers from west to east. The Tien Shan are made up of a complex series of ranges and are around 300 kilometers wide in the center, narrowing at the eastern and western ends. The highest peaks are located in a central cluster on the borders of China, Kyrgyzstan, and Kazakhstan, and include Mt. Tomur at 7,439 meters (also called Janysh/Pobeda in Kyrgyzstan). The Inylchek Glacier, over 50 kilometers long and the largest in the Tien Shan, is also located in this part of the range.

Figure 3.1. Topography of the Mountains of Central Asia



The central Tien Shan, with a mean altitude of over 3,000 meters, contains a high, uplifted massif (plateau) that shares some of the same landscape features as the central Pamir. On the western and northern edges of the Tien Shan, lower arid mountains such as the Nuratau, Chu-Ili Divide, and Karatau run northwestward into Central Asia's deserts. The Tien Shan drains mainly to the north, south and west, and the many streams plunging down the steep northern slopes have formed alluvial deposits on the plains below. These deposits provide sites for settlements and several major population centers.

The Pamir Mountains of Tajikistan and China join the Tien Shan in Kyrgyzstan in the north and the Hindu Kush Mountains in Afghanistan and Pakistan in the south, and contain some of world's highest peaks including Kongur (7,719, China) and Somoni (7,495 meters, Tajikistan). The largest river of Central Asia – the Amu Darya – has its origins in the Wakhan corridor between Pamir and Hindu Kush with many deep valleys, spectacular gorges, and traditional settlements nestled on alluvial fans. People living there – in the Badakshan and the Wakhan regions – are among the most isolated and impoverished in the region.

Glaciers cover four percent of Kyrgyzstan and six percent of Tajikistan, but spread throughout the mountains. Glaciers are crucial to maintaining water flow during the hot and dry summer months.

The climate is arid with most rain falling in the winter and spring. The Tien Shan and Pamir act as a climatic divide and intercepts moist air from the north and west, and prevent it from reaching the hyper-arid Taklamakan desert and the Tarim Basin in China. Precipitation falls mainly in winter and spring, and varies from over 1,000 mm in the Hissar and Ferghana Ranges in the west to below 100 mm in the east. The southwest of the area – the western parts of the Tien Shan and of the Pamir – is influenced by subtropical air and also enjoys mild winters. Temperatures decrease to the east, although there are considerable variations due to altitude. The high plateaus of the Pamir and Tien Shan are the coldest areas, having an annual mean temperature below zero and a very short growing season. Winter temperatures there may reach -40ºC.

Much of the high mountain environment is inhospitable to humans, with barren ground and glaciers, but is still home to such charismatic species as the Marco Polo sheep and the snow leopard. At lower altitudes, the mountains have fine grasslands and forests.

Only half of Kyrgyzstan's land area and less than one third of Tajikistan's land area is suitable for agriculture, mainly for grazing. Croplands and gardens occupy less than 7 and 5 percent of their land areas, respectively. Other lands are considered not suitable for agriculture due to harsh climate, poor soils, and the predominance of rocks and glaciers. Nevertheless, a majority of the mountain communities of Central Asia practice agriculture: principally cultivating cereals and vegetables, gardening, collecting forest products, and livestock grazing on a wide range of pastures.

3.2. Habitats and Ecosystems

The predominant vegetation types in the hotspot are desert, semi-desert, and steppe on all the lower slopes and foothills and in some of the outlying ranges and major basins. Patches of riverine woodland forest, called "tugai," survive along the Amu Darya, Zeravshan, Syr Darya, Chu-Talas, and Ili rivers and a few other places. At higher altitudes, steppe communities dominated by various species of grasses and herbs occur, while shrub communities are widespread in the lower steppe zone. Spruce forests occur on the moist northern slopes of the Tien Shan, while open juniper forest occurs widely in the Pamir-Alai. Meadows typically occur at higher elevations. At the very highest and coldest elevations, there is limited

vegetation cover and diversity, with cushion plants, snow-patch plants, and tundra-like vegetation as well as glaciers.

The hotspot contains ancestors of domestic fruit and nut varieties: apricots, plums, cherries, apples, pears, cherry plums, grapes, pistachios, almonds, walnuts, and pomegranates. In addition, the wild crop relatives of many cultural herbaceous plants – wheat, barley, oats, rhubarb, sorrel, anise, coriander, onions, garlic, tulips – are still found here, making the region an important storehouse of genetic diversity. Further, ancient forms of domesticated animals and their wild ancestors have survived in the region. The fauna of mountain ungulates is particularly diverse, which includes several species of wild goats and subspecies of mountain sheep. The hotspot is also home to magnificent wild cats, the most famous of which is the snow leopard, and it was once home to the now extinct Caspian Tiger.

The geological evolution of the mountains, the wide range of elevations, and the extreme climatic variation have combined to produce great landscape and biotic diversity. The number, extent, and sequence of vegetation zones vary across the hotspot as a function of temperature gradients, moisture gradients, slope aspect, altitude, and latitude, and depending on the sytem of classification, countries report between 20-30 different ecosystem types within their borders. This section summarizes the ecosystems in the hotspot by sorting types into larger groupings. At lower altitudes and in the foothills, dryland ecosystems prevail. At medium altitudes, grasslands, shrubs and forests are widespread. Meadows and tundra-like ecosystems are found in the high mountains. (See Figure 3.2. and Figure 3.3.)

3.2.1. Deserts, Semi-Deserts and Arid Steppes

Desert, semi-desert, and arid steppe vegetation types predominate on all the lower slopes, foothills, and in some of the outlying ranges. Common plants here include species of widespread genera such as *Artemisia, Salsola,* and *Ephedra*, as well as annual grasses such as *Poa* and *Festuca* spp. In the Ili, Amu Darya and Syr Darya river valleys and a few other places, patches of riverine woodland survive, composed of poplar (*Populus* spp.), eleagnus, tamarisks (*Tamarix* spp.), and willows (*Salix* spp.) (Mittermeier *et al.* 2004).

3.2.2. High Steppes

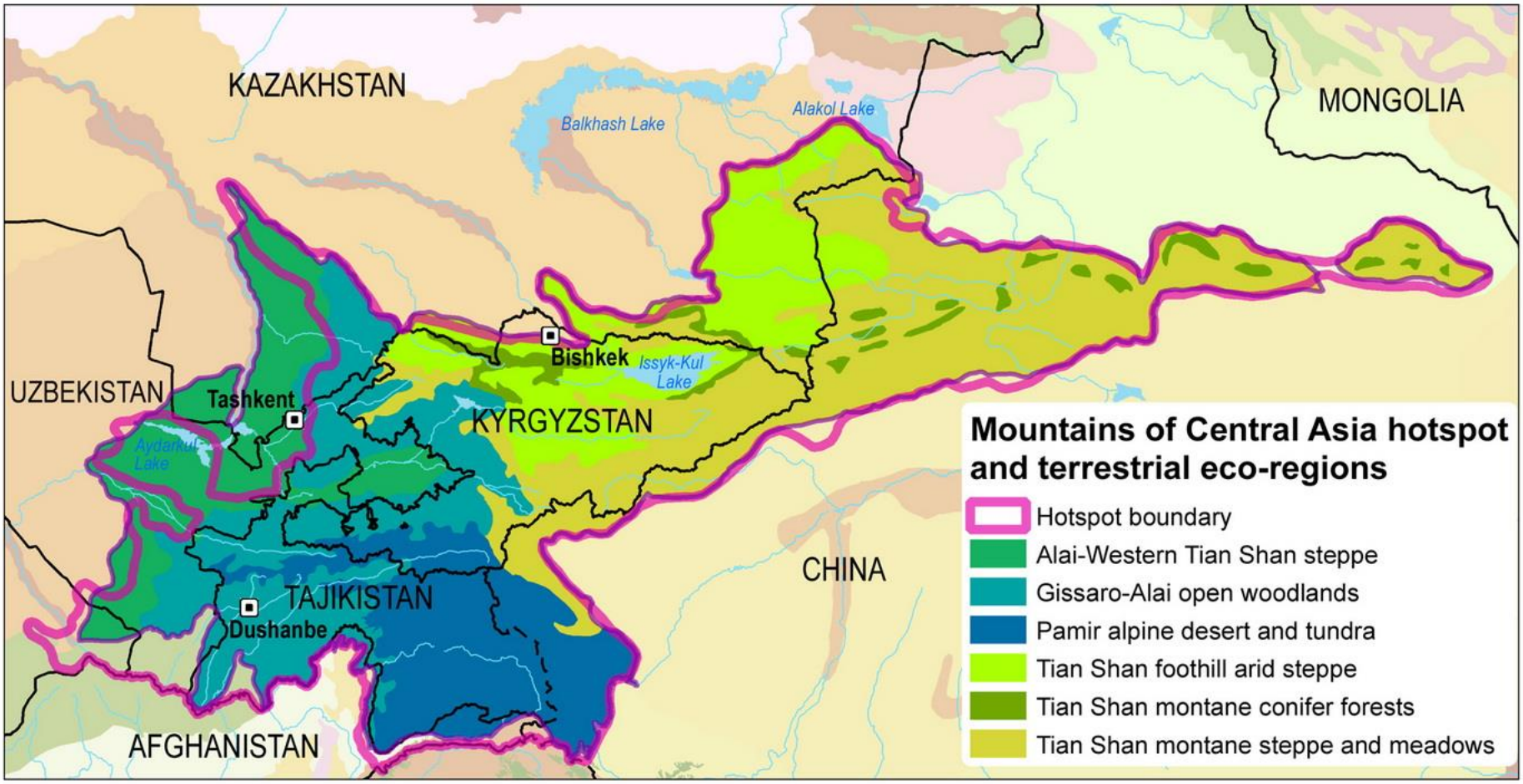
Steppe communities, dominated by various species of grasses and herbs, occur at higher altitudes. A distinctive type of tall-grass steppe, characterized by *Elytrigia trichophora* and *Hordeum bulbosum*, occurs in the western Tien Shan and Pamir. Shrub communities are widespread in the lower steppe zone and may form dense thickets in gorges. Species present include hawthorns (*Crataegus pontica, C. turkestanica*), *Cotoneaster melanocarpa, Euonymus semenovii, Lonicera* spp*., Rosa* spp., and *Berberis* spp.

3.2.3. Forests

Mountain forests provide invaluable watershed protection and erosion control, and contribute to the regulation of water resources by decreasing or smoothing runoff – with a corresponding decrease in erosion – and by retaining groundwater. They also provide mountain people with a rich source of the fuelwood essential to the heating of living spaces, the cooking of food and the purification of drinking water, and with timber and other forest products such as wild fruits, nuts and medicinal plants for subsistence or trade. A relic species of Tien Shan spruce forms a unique and spectacular forest belt in the Tien Shan Mountains.

Figure 3.2. Land Cover in the Mountains of Central Asia

Figure 3.3. Ecological Regions in the Mountains of Central Asia



Walnut and fruit forests. A type of wild walnut-fruit forest unique to Central Asia grows above the steppe zone in warm, sheltered places in the Pamir and Tien Shan. These are diverse and are composed of walnut (*Juglans regia*), almonds (*Amygdalus communis* and *A. bucharensis*), pears (*Pyrus korshinskyi* and *P. regelii*), plums (*Prunus sogdiana* and *P. ferganica*), cherry (*Cerasus mahaleb*), and apple (*Malus sieversii*), along with maples (*Acer turkestanicum* and *A. semenovii*). Some of the surviving walnut trees are estimated to be 500 years old. The area occupied by this habitat has greatly declined, with around 90 percent lost during the last 50 years (Mittermeier *et al.* 2004).

Spruce forest. Spruce forests occur on moist northern slopes of the Tien Shan. They grow in a broad altitude band and include the regional endemic Schrenk's spruce (*Picea schrenkiana*) with some silver fir sub-species (*Abies semenovii*) and associated species of endemic Tien Shan rowan (*Sorbus tianshanica*) and birches (*Betula* spp.). Stands of closed-canopy forest are found in patches of varying size, with the largest on the Kyrgyz Range. More open stands also occur in a forest-meadow mosaic.

Juniper forest. Open juniper forest occurs widely between 1,500 meters and 3,300 meters, particularly in the Pamirs. In the Tien Shan it grows above the spruce belt and is composed of *Juniperus seravschanica, J. turkestanica, and J. semiglobosa* (Mittermeier *et al.* 2004).

3.2.4. Subalpine and Alpine Meadows

Subalpine and alpine meadows occur from 2,000-4,000 meters and above, mainly in the northern and western more humid parts of the hotspot. Plant cover is high, with a tight sward made up of grasses such as *Poa alpina*, sedges (*Carex* and *Kobresia* spp.) and carpeted with a rich variety of herbs including many endemic species. The fritillary (*Rhinopetalum stenantherum*), gentians (*Gentiana* spp.), globeflower (*Trollius dshungaricus*), primulas (*Primula* spp.), tulips (*Tulipa* spp.), anemones (e.g., *Anemone protracta*), louseworts (*Pedicularis* spp.), and aconites (*Aconitum talassicum, A. leucostomum*) are prominent among them. These meadows are at their most attractive in early summer when the flowers are in full bloom. In drier areas of the Pamir and Tien Shan, the mountain meadows are replaced by high-elevation steppes, characterized by grasses such as *Festuca, Poa*, *Puccinellia*, sedges (*Carex and Kobresia* spp.), together with xerophytic perennial herbs (Mittermeier *et al.* 2004).

3.2.5. High-Elevation Vegetation

Vegetation cover and plant diversity declines rapidly as one approaches the upper limits of plant cover, and cushion plants and those with low rosettes that can withstand the high winds, cold temperatures, and aridity become more common. *Acantholimon diapensioides* is the most widespread cushion plant and species of *Saxifraga, Androsace, Rhodiola, Saussurea*, and *Tanacetum* are also frequent. At 4,000 to 4,500 m, even more hardy perennials are found, such as *Thylacospermum caespitosum*, the large, tight cushions of which resemble a moss more than a herbaceous plant, and *Dryadanthe tetrandra*. Snow patch plants also include attractive species, such as the alp lily (*Lloydia serotina*), the large, pale blue and white globeflower (*Trollius lilacinus*), and several crucifers (*Draba* spp.). At such high elevations the vegetation is short, similar to Tibet, with sedge meadows dominated by species of *Kobresia, Shmalhausenia* and *Carex* in areas along valley bottoms. Above this, there are only a few lichens and rare algal films on some glaciers (Mittermeier *et al.* 2004).

3.3. Species Diversity and Endemism

The hotspot harbors significant numbers of wild crop relatives and around 5,000 species of vascular plants, almost one quarter of which are endemic. By contrast, the nearby lowland deserts, which are twice as large, have ony a quarter the number of plant species. Threatened animal taxa include snow leopard (of which the hotspot supports about half the world population), Persian leopard (*Panthera pardus saxicolor*), Saiga (*Saiga tatarica*) on the edges of the hotspot, as well as numerous birds, reptiles, fishes and invertebrates. Caspian tiger (*Panthera tigris virgata*), an iconic large cat that inhabited lower altitude riparian forests, went extinct in the last century. Other species have suffered from anthropogenic transformation, especially the foothills zone, where natural habitats have been converted to agricultural land.

Table 3.1. Species Diversity and Endemism in the Hotspot by Taxonomic Group

Taxonomic Group	Species	Endemic Species
Plants	5,000-6,000	1,500
Mammals	140	10-20
Birds	c.500	1
Reptiles	60-80	10-20
Amphibians	10	2
Freshwater Fishes	30-60	5-10

3.3.1. Plants

The flora of the Mountains of Central Asia is a mix of Siberian, Mediterranean, Indo-Himalayan, and Iranian elements. There are also 64 endemic genera, including 21 from the family Umbelliferae and 12 from the family Compositae. The endemic flora includes tree species, flowers, onions, and grasses.

More than 16 endemic and regionally threatened species of tulip grow in the hotspot. Collecting for horticulture and decoration has led to the decline of many of the hotspot's tulip species, especially in the lowlands and along the roads (Mittermeier *et al.* 2004).

3.3.2. Mammals

Between 10 to 20 species of about 140 mammals found in the hotspot are endemic (depending on the definition of endemic and sub-species): Menzibier's marmot (*Marmota menzbieri*, VU), found only in the western Tien Shan at elevation of 2,000 meters, and the Ili Pika (*Ochotona iliensis*, VU), a small species of lagomorph found only in the Chinese part of the Tien Shan. There are also ground squirrels (*Spermophilus ralli* and *S. relictus*), the Pamir shrew (*Sorex bucharensis*), the Alai mole vole (*Ellobius alaicus*, DD), and other regional endemics.

The hotspot also holds a variety of mountain ungulates, including three endemic subspecies of the argali wild sheep (*Ovis ammon*, VU), among them the Marco Polo sheep (*O. a. polii*), whose magnificent curling horns have made it a favored target of trophy hunters. The Siberian ibex (*Capra sibirica*) is the most numerous and most widespread species, occurring in all parts of the area above the tree line (Mittermeier *et al.* 2004).

Saiga (Saiga tatarica, CR) is a species living on the flat and hilly plains of Central Asia, just on the eduge of the hotspot boundary in Kazakhstan. The number of saigas declined sharply since the 1970s due to the destruction of habitat and hunting (for Chinese medicine), largely restored in the period 2002-2015 due to the efforts of Kazakhstan, and again declined after the mass death of 2015 due to the epizootic pasteurellosis.

Because of their location in the central part of the Asian continent, the mountains of Central Asia play an important connecting role in the distribution of many important montane Asian species. Perhaps the best-known symbol of this fauna is the snow leopard (*Uncia uncia*, EN), a species found in the alpine and subalpine zones of the hotspot. The species has declined here, as elsewhere, as a result of poaching for its valued fur and a depletion of its prey base through illegal hunting (Mittermeier *et al.* 2004).

In addition to the endemic and threatened species, there are other iconic large mammals of local importance, including gray wolf (*Canis lupus lupus*), Turkestan lynx (*Lynx lynx isabellinus*), Altai lynx (*L. l. wardi*), and brown bear (*Ursus arctos*).

3.3.3. Birds

Although nearly 500 bird species occur regularly in the hotspot, none are narrow endemics, although one Data Deficient (DD) species is considered a regional endemic. This is because most species make seasonal latitudinal and/or altitudinal migrations, typically to plains regions to the south. Many species belong to genera typical of the high ranges of Asia, such as redstarts (*Phoenicurus*), accentors (*Prunella*) and rosefinches (*Carpodacus*). Coniferous forests on the northern side of the Tien Shan form the southern limits of several boreal species, including black grouse (*Lyrurus tetrix*) and northern hawk owl (*Surnia ulula*), while steppe and desert birds, including great bustard (*Otis tarda*, VU) and Asian houbara (*Chlamydotis macqueenii*, VU) occur, predominantly in the lowlands (Mittermeier *et al.* 2004).

The Mountains of Central Asia are an important stronghold for birds of prey, with important breeding populations of such species as golden eagle (*Aquila chrysaetos*), eastern imperial eagle (*A. heliaca*, VU), steppe eagle (*A. nipalensis,* EN), booted eagle (*Hieraaetus pennatus*), bearded vulture (*Gypaetus barbatus*, NT), cinereous vulture (*Aegypius monachus*, NT), Eurasian griffon (*Gyps fulvus*), Himalayan griffon (*G. himalayensis*, NT), peregrine falcon (*Falco peregrinus*) and saker falcon (*F. cherrug*, EN).

3.3.4. Reptiles

More than 60 reptiles are found in the hotspot, including 10-20 endemics. Diversity is highest in the lower elevations, in desert and semi-desert areas. There are a significant number of species of lizards and snakes, including ten species of toad-headed agamas (*Phrynocephalus* spp.) (Mittermeier *et al.* 2004).

3.3.5. Amphibians

Amphibian diversity and richness patterns are opposite of that for reptiles. Species richness is low – only 8-10 species of amphibians have been recorded here, two of them are endemic, including the Semirechensk salamander *(Ranodon sibiricus,* EN) found in the Jungar-Alatau in China and Kazakhstan and a frog (*Rana terentievi*) in southern Tajikistan.

3.3.6. Freshwater Fishes

This arid hotspot has about 30-60 freshwater fish species (depending if introduced species and sub-endemics are counted), about 5-10 of which are narrow endemics. Endemism is centered in the Issyk-Kul Lake and Talas River basin, which lacks outlets to connect it with any other bodies of water. In addition, the Koytendag blind cave fish (*Troglocobitis starostini*) is found in a cave system of the Koytendag Mountains in Turkmenistan (Mittermeier *et al.* 2004).

3.4. Ecosystem Services

The hotspot provides an astonishing array of ecosystem goods and services that are essential for the sustainable development of the whole region. These goods and services fall into four broad categories – provisioning, regulating, cultural, and supporting – and include food products; fiber and wood; land for food production; genetic and medical resources; watershed protection; habitat for flora and fauna of local and global significance; the regulation of natural hazards and climate; natural areas for leisure and recreational activities; and perhaps most important of all, the storage and release of water (Table 3.2). In the Regional Sustainable Development Strategy of Central Asia (2009), the governments officially acknowledge the role of mountains as "water towers" and storehouses of biodiversity.

Most of the population of Central Asia relies on water that falls in the mountains, where it is stored until making its way downstream to population centers. Densely populated valleys and oases of the vast drylands depend on numerous rivers and streams, especially the Syr Darya River, which rises in the Tien Shan Mountains, and the Amu Darya, which rises in the Pamir. Each flows more than 2,000 kilometers to empty into the Aral Sea. Other major regional rivers originating in the mountains are the Sarydjaz, Ili, Chu, and Talas.

Tajikistan holds 40 percent and Kyrgyzstan 30 percent of the water resources serving the five former Soviet republics. Uzbekistan, with the largest share of population in the hotspot, is the biggest water consumer, in large part because of an economy based on irrigated agriculture. Uzbekistan and Turkmenistan, with 90 percent of their water resources coming from mountains located outside their country borders, are highly vulnerable to water shortages.

Mountains provide a profound sense of place, a source of inspiration, and a rich cultural heritage. People in isolated parts of the hotspot, especially in the Pamir and Wakhan, differ from those in the main valleys, and communities have developed distinct cultural identities, agricultural traditions, and languages. However, with modernization and the dominant influence of Soviet and Chinese cultures, many minorities have lost some of that identity.

The diverse culture of the region, and the strong sense of place that the mountains provide, attract visitors from around the world, and tourism offers an additional income source for mountain communities.

Residents of of the region's largest cities – Tashkent, Almaty, Bishkek, Dushanbe, and Urumqi rely on the mountains for water, fresh air, and breezes that disperse urban air pollution. The mountains' lakes and white-water streams are among the most popular weekend destinations for urban residents. The mountains also provide hiking, picnics, horseback riding, skiing, geothermal spas and resorts, and family farms selling fresh products to urban dwellers. However, many areas are suffering from poorly planned tourism development.

The governments in the seven countries have, to varying degrees, expressed interest in formally valuing their ecosystem services.

Table 3.2. Principal Ecosystem Services

Type of Service	Ecosystem Service	Beneficiaries	Relative Importance within the hotspot
Provisioning	Water (artisanal and run-off) for drinking, irrigation, industrial use, energy generation	Entire population	High
	Fisheries in freshwater	Local fishers, fish consumers, associated economic activity	Locally important
	Wood for firewood, charcoal	Rural communities	Minor, but significant for some remote communities
	Timber, poles and other construction material	Timber traders, forest owners, crafts-people	Significant in some areas
	Non-timber forest products (e.g. resins, fibers, fruits)	Rural and agrarian communities	Locally important for forest communities
	Grazing and fodder for livestock	Local livestock herders and, indirectly, consumers of milk, meat	High
	Medicinal plants	Local populations	Locally important, in China active use in traditional medicine
	Genetic resources	Agro-industry	High
Regulating	Moderation of extreme events	Entire population	Significant in some areas
	Reduction of soil erosion through stabilization of soils	Local populations, economic activity, especially in mountainous and arid areas	Significant in some areas
	Local air quality	Urban populations	Moderate
Supporting	Habitat for plants and animals	Agricultural population, global existence value	Significant
	Maintenance of genetic diversity	Agricultural community and users	High
	Carbon sequestration	Global	Low
Cultural	Recreation	Local populations, especially urban populations using natural areas	High
	Tourism using natural spaces	Global tourists, local people engaged in the tourism economy	High
	Spirituality	Local populations	Significant in some areas

4. CONSERVATION OUTCOMES

CEPF identifies conservation outcomes at three scales, which are collectively needed to conserve global biodiversity:

1. Globally threatened species on the IUCN Red List.
2. Sites that contribute signficiantly to the global persistence of biodiversity (i.e., Key Biodiversity Areas or KBAs).
3. The conservation landscapes necessary to maintain the ecological and evolutionary processes upon which those sites and species depend.

In order to track and evaluate the effectiveness of its investments (in synergy with other projects and funding), CEPF sets quantitative targets and monitors the performance of its grants and portfolios towards these targets. To this end, conservation outcomes are measured in terms of "species extinctions avoided", "KBAs protected" and "ecological corridors created".

Conservation outcomes are defined sequentially, with species outcomes being defined first, then site outcomes and, finally, corridor outcomes. Since species outcomes are extinctions avoided at the global level, they encompass globally threatened species, in the IUCN Red List categories Critically Endangered (CR), Endangered (EN) and Vulnerable (VU). Species threatened nationally – but not globally – are not identified as species outcomes: while they may be high local priorities, if they are common or widespread in other parts of the world, they are not global priorities. Similarly, if no formal assessment has been conducted to define a global threat status, species cannot be global priorities.

Site outcomes are defined next, to provide a lens for focusing investments in site-scale conservation action. Within the biodiversity hotspots, CEPF targets investment toward specific sites that are globally important for biodiversity. The principal basis for defining site outcomes in this assessment is *A Global Standard for the Identification of Key Biodiversity Areas* (IUCN 2016; hereafter the "global KBA Standard"). KBAs are identified for globally threatened species and ecosystems that are best conserved through the network of sites at which they are present in significant proportions. In addition, many KBAs in the hotspot are defined based on the populations of geographically restricted species (mostly endemic plants) and congregatory species (mostly birds). Sites supporting significant populations of restricted-range species contribute significantly to the global persistence of biodiversity, because there are few or no other sites in the world for which conservation action for these species can be taken. Sites that support globally significant aggregations of one or more species at particular times of year (e.g. for breeding, feeding, wintering) can also be identified as KBAs; these species are often particularly vulnerable to exploitation and habitat loss.

Site outcomes are achieved when a KBA is safeguarded through improved management or expansion of an existing protected area, creation of a new protected area (including conventional, government-managed protected areas and community or privately managed ones), and improved management of KBAs without protection status. Improved management may include changing or adjusting management practices for a KBA in order to improve the long-term persistence of species and ecosystems. Expansion or modification of existing protected areas or management plans may involve increasing the proportion of a KBA under conservation management to meet species' requirements or introducing species-focused measures to ensure that (previously) neglected species or sites receive due attention. Creation of a new protected area may involve designating all or part of a KBA as a national, local, community or privately managed area with special conservation or land-use status.

The long-term persistence of biodiversity requires the protection of landscapes or conservation corridors. This is particularly important for the conservation of broad-scale ecological and evolutionary processes, and for the conservation of species with wide ranges, low natural densities and migratory behavior. In addition, conservation corridors may effectively support cross-border collaboration between the managers of neighboring KBAs that are ecologically similar but divided by a national border. Conservation corridors can also be an effective tool for mainstreaming conservation requirements into land-use planning and promoting biodiversity-friendly management practices in production landscapes, such as cultivated land, pasture and forestry concessions.

Corridors are the last scale at which conservation outcomes are identified. Corridor outcomes are achieved when a conservation corridor maintains little-changed natural processes and contributes to ecological connectivity of KBAs and species ranges. Conservation corridors are landscapes anchored on KBAs, linked together by corridors or "stepping stones" of natural habitats, which maintain ecological integrity and facility movement of wide-ranging and migratory species (so-called "landscape species"). In the Mountains of Central Asia, habitat requirements of landscape species (such as snow leopard), latitudinal and altitudinal migrations of species, and considerations of potential climate change impacts on the future distribution of species and ecosystems inform the definition of conservation corridor boundaries. In addition, conservation corridors take into consideration the results of previous conservation planning exercises, in particular the WWF ECONET initiative for Central Asia (which included all hotspot countries apart from Afghanistan and China).

4.1. Species Outcomes

4.1.1. Methodology

Species outcomes comprise those species that regularly occur in the hotspot and are classified as globally threatened (Table 4.1, Appendix 1). The identification of these species is based on the IUCN Red List and includes species in categories Critically Endangered (CR), Endangered (EN) and Vulnerable (VU). Extinct taxa, such as Caspian tiger are not listed, neither are species that have not been observed in the hotspot for the last 30 years, such as Syr-Darya shovelnose sturgeon (*Pseudoscaphirhynchus fedtschenkoi,* CR) and dhole (*Cuon alpinus*, EN) (Appendix 2). CR, EN and VU species that occur in the hotspot countries but not within the hotspot limits are also excluded, although some gaps are possible (see Section 4.2.3). Reintroduced species, such as Przewalski's horse (*Equus ferus*, EN), as well as the introduced fringebarbel sturgeon (*Acipenser nudiventris*, CR), are included, however, since they occur within the hotspot, although they did not necessarily occur there historically. Selected species, included ones classified as Data Deficient (DD) and Near Threatened (NT) and national endemics that meet the IUCN Red List criteria for a global threat category, are listed as candidate species outcomes (Appendix 3). If, during the CEPF investment, they are formally assessed as globally threatened on the IUCN Red List, they could be recognized as priorities for research or conservation action.

4.1.2. Species Outcomes in the Hotspot

A total of 68 species outcomes were identified during the ecosystem profiling process, around half of which are animals (mainly vertebrates) and half are plants (Table 4.1). Assessments of the global conservation status of mammals, birds and amphibians are comprehensive, and relatively up to date. Assessments of reptiles and fishes are patchier, while only a tiny proportion of invertebrates have been assessed according to the Red List categories and criteria. The same is true for plants, only a small tiny fraction of which have been assessed for their conservation status. Even considering this, 15 of the 19

CR species in the hotspot are plants. The part of the hotspot within Uzbekistan, Tajikistan, Kazakhstan and Kyrgyzstan has a high number of globally threatened species.

Table 4.1 Synthesis of globally threatened species in the hotspot

Group	CR	EN	VU	Total
Vertebrates (total)	4	9	23	36
Mammals	*1*	*4*	*5*	*10*
Birds	*1*	*4*	*12*	*17*
Reptiles	*0*	*0*	*2*	*2*
Amphibians	*0*	*1*	*0*	*1*
Fishes	*2*	*0*	*4*	*6*
Invertebrates	0	0	3	3
Plants	15	10	4	29
Total	**19**	**19**	**30**	**68**

Mammals

One iconic mammal (sub-species) in the hotspot was Caspian tiger, which was last seen in the first half of the 20th century in the tugai riverbed forests across the region. Tigrovaya Balka (also known as Beshai Palangon), the oldest nature reserve in Tajikistan, was specifically created for the protection of tiger and its prey species. Presentday conservationists are hopeful to see tiger back again in Central Asia, at least in the Balkhash Lake wetlands of Kazakhstan, which are considered an appropriate habitat for reintroduction of the closely related subspecies Amur tiger (*Panthera tigris altaica*). Of the 10 globally threatened mammal species that currently occur in the hotspot, four are Endangered, including a narrow endemic, Ili pika, in China, and the more widespread Bukhara deer (*Cervus hanglu*), which was recently recognized as a separate species. Snow leopard is a top regional conservation concern and focus of attention for policy-makers. The fourth Endangered mammal species is Przewalski's horse, which is the focus of reintroduction efforts. Also of elevated conservation concern, from the perspective of participants at the national and regional consultations was urial (*Ovis orientalis*, EN), a species of wild sheep with several sub-species in the hotspot and Saiga (*Saiga tatarica,* CR) along the edges of the hotspot. Stakeholders also note the importance of wolves, lynxes, and bears, although they are not assessed as globally threatened. (Lynxes and bears are protected by law in most of the hotspot countries.)

Birds

Seventeen bird species occurring in the hotspot are globally threatened, one of which, sociable lapwing (*Vanellus gregarius*) is Critically Endangered. For many bird species, for example lesser white-fronted goose (*Anser erythropus*, VU), the wetlands of the hotspot play a key role in their survival. Among threatened birds of prey, the hotspot is particularly important for the conservation of eastern imperial eagle (VU), steppe eagle (EN) and Egyptian vulture (*Neophron percnopterus*, EN). In addition to species currently assessed as globally threatened, participants at the consultations suggested that attention be given to large-billed reed warbler (*Acrocephalus orinus*), cinereous vulture, bearded vulture and Himalayan griffon (Appendix 3).

Reptiles

There are only two globally threatened reptiles found within the hotspot. One is Central Asian tortoise (*Testudo horsfieldii*, VU), a relatively common and widespread species. The other is Strauch's toad agama (*Phrynocephalus strauchi*, VU), a narrow endemic found only in the Ferghana valley. Greater numbers of threatened reptiles are found in the vast deserts of Central Asia outside of the hotspot boundaties.

Amphibians

The hotspot supports very few amphibian species (up to 10 in total). These include one Endangered and narrowly endemic species: Semirechensk salamander. China has established a specialized nature reserve to protect this salamander but more efforts are needed, including in collaboration with Kazakhstan, where the species also occurs.

Freshwater Fishes

There are at least six threatened species in the hotspot. Fringebarbel sturgeon is a Critically Endangered species native to the Aral Sea, where it went extinct due to habitat degradation. In an effort to save the species, it was introduced to Balkhash Lake in Kazakhstan and the Upper Ili River in China that flows into this lake. The species is considered as a conservation priority in both countries but there are enough research and protection efforts in place already, and it does not require additional support from CEPF. On the contrary, little conservation and research is conducted on the Amu-Darya shovelnose sturgeon, a Critically Endangered species found in the Amu-Darya system. Its cousin, Syr-Darya shovelnose sturgeon, was only known from the Syr-Darya River. However, there have been no reports since the 1960s, and it is believed to be probably extinct. Participants at the consultations requested that selected narrowly endemic fish species that are nationally red listed be recognized as priorities for research or conservation action by the CEPF grantees, and these are included on the list of candidate species outcomes in Appendix 3.

Plants

Twenty-nine plant species found in the hotspot have been formally assessed as globally threatened. Many of these are narrow endemics, including some known from no more than a handful of sites. Participants at the national and regional consultations gave particular priority to crop wild relatives, because of their high value genetic resources. These include wild relatives of pear (*Pyrus cajon*, EN, *P. korshinskyi*, CR, and *P. tadshikistanica*, CR), apple (*Malus niedzwetzkyana*, EN, and *M. sieversii*, VU) and apricot (*Armeniaca vulgaris*, EN). Beyond the species currently included on the IUCN Red List, there are many narrowly endemic plants that meet the criteria for CR, EN or VU status. Some of these species were identified by participants at the consultations, and are listed as candidate species outcomes pending formal assessment (Appendix 3). These species were used to identify KBAs, which can be triggered by the occurrence of restricted-range species or endemic species assessed as globally threatened at the national or regional level. Since most of the KBAs in the hotspot are defined by or include narrowly endemic plant species, site-level conservation actions will address their main conservation need (habitat protection), even if they are not recognized as species outcomes. With this in mind, participants suggested that research efforts should focus on poorly known restricted-range plant species, with few or no known populations within KBAs.

4.2. Site Outcomes – Key Biodiversity Areas

4.2.1. Methodology

Site outcomes comprise KBAs: sites of importance for the global persistence of biodiversity. KBAs are identified for biodiversity elements for which specific sites contribute significantly to their global persistence, such as globally threatened species or ecosystems. The identification of KBAs uses multiple criteria and sub-criteria, each with associated quantitative thresholds (IUCN, 2016). Sites are identified as KBAs when they meet at least one of the following criteria:

- A1: presence of a significant proportion of the global population of one or more globally threatened species.
- A2: presence of a significant proportion of a threatened ecosystem.
- B1 to B4: presence of geographically restricted biodiversity (which may not necessarily be threatened), including individual species, co-occurring species, assemblages of species, and ecosystem types.
- C: ecological integrity: sites that hold wholly intact ecological communities with supporting ecological processes.
- D: exceptional biological processes, including demographic aggregations (such as seasonal breeding or feeding aggregations of a species), ecological refugia, and source populations essential for the survival of the species.
- E: irreplaceability: sites identified as having through quantitative analysis of complementarity between sites that confirms a very high irreplaceability for the global persistence of biodiversity through a complementarity-based quantitative analysis of irreplaceability.

In consultation with CEPF and international advisors, the ecosystem profiling team at Zoï Environment Network and in-country experts focused on a subset of these criteria, in response to limitations of time, and information. Criterion A1 was applied, using available information on globally threatened species, and locally endemic species assessed as threatened under national or regional assessments. Criterion A2 was initially considered for potential use by the team but the coverage of the IUCN Red List of Ecosystems does not yet extend to Central Asia, meaning that this criterion could not be readily applied. Criterion B1 (individual geographically restricted species) was applied, due to the availability of data on restricted-range species, especially plants. The other B criteria were not applied systematically, due to their complex nature and lack of time and budget. Nevertheless, some tentative KBA nominations under Criteria B2 (co-occuring geographically restricted species) and B3 (geographically restricted assemblages) were proposed by national experts, based on IBAs previously identified by the BirdLife International Partnership. Criterion D1 (demographic aggregations) was applied, especially to data on birds. This was largely through reassessment of IBA data against the new thresholds in the new Global Standard for the Identification of KBAs (IUCN 2016). Criteria D2 (ecological refugia) and D3 (recruitment sources) were not applied systematically, due to lack of relevant information. Finally, Criteria C and E were not applied due to lack of time, data and budget.

KBAs are sites, meaning that they have a boundary that can be shown on a map. The aim of KBA delineation is to develop boundaries that are ecologically relevant yet practical for management. Thus, delineating the boundary of a site requires both spatial data and expert judgment on the likely limits of the ecosystems, ecological communities or individual trigger species for which the site is identified. It also requires pragmatic judgment so that, for example, it may make sense to use an existing boundary of

a protected area or an administrative boundary or other type of management unit, such as a mining or hunting concession, forest management unit (known as “leshoz” in the five countries of Central Asia) or water protection zone, to yield a site that is actually or potentially manageable as a single unit, where this appears to coincide with the ecological boundary of the site.

The global KBA Standard (IUCN 2016) and the earlier guidelines for identification and gap analysis of KBAs (Langhammer *et al.* 2007) provided additional guidance, possible approaches and choices for delineation. There were two situations where delineation was relatively simple and straightforward:

- Where a candidate KBA generally coincided with the boundaries of an existing protected area with effective enforcement and management.
- Where a candidate KBA could be defined geographically as a section of river or catchment that was sufficient for conservation management of the biodiversity elements for which the KBA was identified.

Many KBAs in the Mountains of Central Asia Hotspot fell into one or both of these categories. Even then, the application of these apparently simple rules could be complicated. For example, large protected areas (such as Tajik National Park in Tajikistan or Khan Tengri National Park in Kyrgyzstan) or protected areas nominated as UNESCO World Heritage sites often have different management sub-units. Some examples are discussed in Section 4.2.3.

Another challenge was that the quality of available protected area maps varies from country to country. In Kazakhstan and Kyrgyzstan, protected areas maps are digitized and were relatively easy to access (except for the newest protected areas). Turkmenistan and Uzbekistan have good maps, too, but these were not easily accessible. In Tajikistan, reliable, up-to-date protected area contours (as well as the latest state border lines) are missing, especially for species management areas, while, in China, most protected areas are well defined, while some are not. For all countries, the World Database of Protected Areas (WDPA) was considered incomplete and outdated for the scope of the assessment.

4.2.2. Departure Points and Steps in KBA Identification

In the past, a site could qualify as a global KBA on the basis of the confirmed presence of a globally threatened species or a single-site endemic. However, the new standard imposes higher documentation requirements, needing proposers to demonstrate that a site must regularly hold a specific proportion of a species’s global population for it to qualify as a global KBA. A number of metrics can be used to infer that the global population thresholds are met at a site, such as range, area of occupancy and extent of suitable habitat (IUCN 2016). For many globally threatened and restricted-range species in the Mountains of Central Asia Hotspot, the required data on global and site-level population (observed or inferred) were not available in time. Thus, it was not always possible to determine whether a given candidate site met the new global criteria and could be confirmed as a global KBA within the timeframe of the ecosystem profiling process. Such sites were considered “KBAs with global/regional status not confirmed”. This particularly applies to sites identified as IBAs under a previous analysis by the BirdLife International partnership, which used an earlier set of thresholds. Sites for which the available data showed that they met the thresholds of the new standard were considered “confirmed global KBAs”. Priority sites for CEPF investment were selected only from among sites in this last category. Further work is a priority to mobilize data to determine the status of the KBAs with global/regional status not confirmed. If such analyses confirm that these KBAs qualify at global KBAs, they will be added to the list

of site outcomes for the hotspot, and be eligible for consideration when the list of CEPF priorities is next updated.

The expert team analyzed the globally threatened species on the IUCN Red List that occur within the boundaries of the Mountains of Central Asia Hotspot. For Kyrgyzstan and Tajikistan, these essentially comprised the entire country list. For the other hotspot countries, national experts screened and analyzed the list of species to remove those that did not regularly occur within the hotspot boundaries or were considered extinct. Further work involved detailed, site-specific screening of species populations to assess which ones could potentially meet the global thresholds established in the new standard.

BirdLife International provided an extract from the World Bird and Biodiversity Database, of all IBAs that lie within the hotspot boundaries. Bird species data for these pre-existing IBAs were analyzed and those sites that the available data enabled Criteria A1 (globally threatened species) or D1 (demographic aggregations) to be triggered were designated as confirmed global KBAs. Other IBAs were designated as "KBA global/regional status not confirmed", and are shown on the maps as pink-shaded polygons.

WWF Russia provided the ECONET project database and GIS data, which contains useful information for screening core biodiversity areas against the global KBA criteria. The profiling team encountered a lack of site-specific information on species and outdated assessments (more than 10 years old), which were typical obstacles throughout the KBA identification process.

The Wildlife Conservation Society (WCS) Afghanistan Program provided comprehensive data and maps on distribution and population size of species in the Wakhan valley and the main threats to biodiversity there.

In contrast to ecosystem profiling efforts in other hotspots, there were no Alliance for Zero Extinction (AZE) sites identified for the Mountains of Central Asia, while Important Plant Areas (IPAs) directly useful to the application of the global KBA Standard were not available.

Since the KBA concept was new to the region (and known mainly to those conservation groups and scientists who had worked on IBA identification), the profiling team had to make a major effort to introduce the concept, including translating the global KBA Standard (IUCN 2016) into Russian. Across the region the team provided detailed explanations of the global KBA criteria at technical meetings and consultations, which brought together biodiversity experts, the general public and politicians. The consultations gave a wide range of stakeholders the chance to contribute to draft lists of KBAs and species, discuss boundaries, and suggest additional candidate KBAs. Chapter 2 describes the consultation process in more detail.

Multiple criteria were used to prioritize KBAs for conservation investment, encompassing considerations of biological importance, existing and planned conservation actions, security and accessibility of the site, status of legal protection, geography and other aspects of feasibility. Biological prioritization was carried out on the basis of uniqueness (i.e., irreplaceability, or how many other sites are known to hold the same species or ecosystems), vulnerability (i.e. global threat status of the species triggering KBA status) and perceived or assessed level of threats to the site (i.e., the likelihood that the site will lose the features that qualify it as a KBA), following the methodology suggested in Langhammer *et al.* (2007). Given the very intense nature of the assignment, and an extensive list of species and sites, the decisions

on prioritization of specific species and sites by the workshop participants and the expert group were primarily based on:

- Practical feasibility for implementation of CEPF-funded conservation projects by CSOs.
- Likelihood of achieving conservation outcomes for priority species and sites.

Given the topography of the hotspot, and the concentration of biodiversity in areas away from major centers of human population, many KBAs lie along international borders, and require coordinated actions on both sides. To provide opportunities for cross-border conservation initiatives, or simply coordinated investments in site-specific work at ecologically similar KBAs divided by international borders, attention was also given to prioritizing contiguous KBAs in neighboring countries.

The prioritization exercises during the national consultations also took note of the fact that CEPF has not yet worked in the Mountains of Central Asia Hotspot, and thus local CSOs and policy-makers need more time to become familiar both with CEPF and the KBA concept. In this context, assigning priorities to sites and species that might have high biological priority but where CSOs are not currently active and do not have established relationships with local stakeholders might not be productive. Therefore, the final list of priorities considers both biological criteria and local specificities capturing political priorities and realities, as well as opportunities for synergistic investments with other projects. The final prioritization of sites for CEPF investment is presented in Chapter 12.

4.2.3. Limitations of the Assessment and Outlooks for Improving the Analysis and Practical Engagement with KBA Stakeholders

All KBAs were defined using the global KBA Standard (IUCN 2016), which was completely new to the region, as was the very concept of a KBA. A considerable effort was required to explain KBAs to the broad range of stakeholders, from conservation-focused CSOs to officials, private sector participants and researchers. The actual identification of KBAs required confirmed records of the presence of trigger species, ecological communities or ecosystems, with sufficiently accurate and up-to-date data on species populations and distribution of communities and ecosystems. IBAs, which were originally identified and mapped between 2004 and 2008, were the only proxy sites available that had been defined following a similar methodology to the global KBA Standard.

The absence of data on the distribution of species among sites was a particular constraint in most parts of the hotspot. There were only a few recent surveys available on species of conservation concern, such as snow leopard, argali and a few others. Distributional data on the majority of restricted-range species and many globally threatened species were scarce, obsolete (more than 10 years old) and insufficiently precise (e.g., no detailed geographic information or site locations). There was, thus, a bias in the identification of KBAs towards well known or well observed groups of species, and towards areas where there has been a recent and robust survey effort. For example, in largely insecure Afghanistan, the Wakhan National Park established in 2014 has been spared from conflicts. Thanks to the efforts of WCS and the National Environmental Protection Agency of Afghanistan (NEPA), this site is better studied for large mammals than most other biodiversity-rich areas of Central Asia. It meets the global KBA criteria based on the number of snow leopards alone, and holds significant populations of other species as well. On the other hand, in all other sites in northern Afghanistan and many candidate KBA in Kyrgyzstan, data on snow leopard, not to mention numerous lesser-known species, are not available or are outdated, incomplete or poorly documented. Thus, such sites could not be confirmed as global KBAs and remain in candidate status. The recently published cadastres of flora and fauna of Kyrgyzstan (Lazkov

and Sultanova, 2014) could have been extremely useful for work on KBA identification. However, the lack of spatial and numerical information on species distribution placed limits on their use in the assessment.

Tajik National Park covers (2.2 million hectares, equivalent to the half the size of Switzerland). It includes numerous sub-sites that have trigger species and qualify as KBAs on their own right, such as Karakul Lake, Murghab, Pshart and areas of the Western Pamirs that hold narrowly endemic wild crop relatives. On the other hand, such fragmentation of a single management unit is not in line with the global KBA Standard, which encourages delineating KBA boundaries to correspond with the most appropriate management unit(s). In this case, the KBA boundaries followed the official boundaries of the national park, which was nominated as a UNESCO natural World Heritage site in 2013. While amalgamation of smaller KBAs into a single large one does result in a loss of information about sub-sites, it makes more sense from the conservation point of view, especially when species with large ranges are considered. For example, the assessed (inferred) number of snow leopards in the national park triggers the global KBA Criterion A1 when the park is considered as a single unit but would not do so if each of the smaller units was considered separately.

The Issyk Kul Biosphere Territory, which comprises the entirety of Issyk-Kul province of Kyrgyzstan, covers 4.3 million hectares: an area larger than Switzerland. Its official status and legal regulations date back to 1998 but, in reality, it does not function as a protected area, since enforcement capacities are weak or not adequate to conservation tasks across such a large area. Numerous individual nature reserves within the biosphere territory work relatively well, however, with Sarychat-Ertash Strict Nature Reserve being one the best protected and monitored sites in Kyrgyzstan. This site, and the new Khan-Tengri National Park established in 2016, both qualify as global KBAs for snow leopard and other species.

Issyk Kul Lake, the central element of the biosphere territory, a biologically important site listed under the Ramsar Convention, is a more complicated case. The lake is very large (1.6 million hectares, almost half the size of the former Aral Sea) and supports a number of endemic and near-endemic fishes, many of which are on the brink of extinction due to over-fishing and introduction of non-native predatory fishes. On the one hand, the entirety of Issyk Kul Lake could be considered as one KBA based on species and possibly ecosystem-based criteria. On the other hand, its original aquatic and shoreline ecosystem has changed dramatically over the last 50 years and its designation as a single, effective management unit is doubtful due to its size. Consequently, the western and eastern parts of the lake and adjacent shoreline were identified as separate KBAs.

The upstream Ili River basin protection zone in China posed similar challenges. The size of the management unit was considered inappropriate for site and species-focused conservation. The same was true for the downstream Ili basin in Kazakhstan, which discharges into Bakhash Lake (outside of the hotspot boundary). This area was also considered too large to effectively manage as a single unit, especially given the activities of numerous economic sectors (e.g., mining, tourism and agriculture) that contribute to water pollution and river-flow fragmentation. Consequently, several smaller KBAs were identified within the Ili basin.

The ecosystem profiling team faced several other challenges in applying the global KBA Standard in the context of the Mountains of Central Asia Hotspot. To the extent that these can be addressed, whether as part of the CEPF investment phase or through separate initiatives, the quality and efficiency of future conservation planning processes in Central Asia will be improved.

- **Species synonyms and sub-species**: Some of the species that were screened and analyzed as part of the KBA identification process have multiple sub-species or synonyms. The most exemplary is argali (*Ovis ammon*, NT), which has four sub-species present within the hotspot: *O. a. karelini*; *O. a. severtzovi*; *O. a. nigrimontana*; and *O. a. polii.* Some of these sub-species are considered as regional endemics, such as Karatau mountain sheep (*O. a. nigrimontana*) and Severtzov mountain sheep (*O. a. severtzovi*), which are recognized nationally as distinct species. There are differing opinions regarding the taxonomic status of these and other taxa of large, globally threatened mammals (e.g. leopard and urial), as well as regarding various endemic fishes and plants. In many cases, the taxonomy debates remain unresolved. The global KBA Standard emphasizes the use of species, rather than sub-specific taxa, for application of the KBA criteria. This conflicts with the opinion of many national experts, who suggested that sub-species of large mammals and reptiles should be considered in KBA identification. The result is that local sub-species of gray wolf, brown bear, and Eurasian lynx, among others, are not used as KBA trigger species or included as species outcomes (Appendix 1) but do appear as candidate species (Appendix 3).

- **Definitions of endemism and ecosystems:** The definitions of these terms used in the global KBA Standard differ from those used in the region traditionally. Given that spatial information on species distribution is missing or incomplete, it was not always possible to define which species have a global range of less than 50,000 square kilometers or to comprehensively check the linear distributions of aquatic species to see if these are less than 200 kilometers. There are also several ecosystem classifications available for the hotspot, depending on the group of authors or the country in focus. Ecosystem classifications and maps already differ among the hotspot countries and adding a global approach and definitions makes the task even more complicated.

- **Anthropogenic ecosystems:** It was not always obvious to the general public or policy makers why anthropogenic ecosystems, such as wastewater lakes, reservoirs with dams and irrigated lands with extensive canals, could qualify as KBAs of global importance.

- **Limitations in access to and the use of global assessments and information:** These limitations are linked to both English-language skills of local experts and inconsistencies among global, regional and national assessments of the conservation status of species. For example, the global threat level for markhor (*Capra falconeri*) was been downgraded in 2015 from EN to NT, while, in the hotspot countries, it is still officially considered to be a threatened species (in addition to being a regional endemic). What is more, some NT species with a large area of occupancy, for example, birds of prey, may have their largest populations or best-preserved habitats in the hotspot, as compared to other parts of the world. While they are not threatened with extinction, conservation efforts for these species in the hotspot many make a disproportionate contribution to their global persistence. The profiling team made their best effort to provide translations of key references into the two main working languages in the hotspot: Russian; and Chinese. Over time, access to international expertise and regional data exchange may help fill gaps in knowledge, and help align local perceptions of conservation priorities with global ones. One lesson here is to fully account for the funds and time needed for translation (and editing) during the CEPF investment phase, to broaden the understanding by and involvement of all interested stakeholders.

- **Lack of global population data:** Lack of data needed to estimate or infer global population sizes of globally threatened or restricted-range species became a barrier to applying KBA Criteria A1

and B1, especially for plants. For example, there is no global or comprehensive regional assessment of the distribution of *Malus sieversii* (VU), which is believed to be the ancestor of the domesticated apple. While it is known to occur in China, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, and local data exists, it proved impossible to apply the KBA criteria for this species, as its global population could not be either estimated or inferred with any degree of accuracy. In order to partially compensate for this gap, Kazakh experts applied the metric for "distinct genetic diversity", which can be used to infer that KBA thresholds are met under the threatened and geographically restricted species criteria, based on Kazakhstan's extensive research on this topic.

- **Lack of robust local data:** Large differences exist among countries in terms of the availability of up-to-date, spatial precise data on the status and distribution of species. For example, thanks to the support of the government, the GEF and other partners, Uzbekistan has digitalized flora and fauna data, and has conducted extensive research on potential expansion of the protected area system, which helped enormously in the KBA analysis. Data on the Wakhan valley in Afghanistan are also rich and up-to-date, while data for all other candidate KBAs in Afghanistan are either missing or outdated. In Tajikistan, good data exist in the National Biodiversity Centre. However, due to a lack of modern research, many datasets are based on past studies, and only a few areas with ongoing or recent biodiversity projects have robust, up-to-date information. In Kyrgyzstan, there is a large diversity of data and holders but, unfortunately, the limited timeframe and budget for the ecosystem profiling process prevented the full use of expertise and the pool of available data. In China, Kazakhstan and Turkmenistan good information exists but it is limited to protected areas. Areas outside protected areas have little or obsolete information, except for selected IBAs, where bird counts and monitoring of species is conducted, and biodiversity project sites. In all hotspot countries, official data on the wildlife population sizes tend to be aggregated at the provincial or country level, and focused on hunting quarry species (e.g., ungulates) or iconic species (e.g. snow leopard and saiga).

- **Lack of access to local and international expertise:** Invertebrates and fishes are among the most challenging groups, as research on these species is patchy, there are very few experts in each country with good knowledge, and, in general, the top experts are very busy. To engage the top experts requires forward planning (they can be busy on other projects or away in the field), good compensation and enough time for preparation. The ecosystem profiling team had only four months (during the peak field season) and a very limited budget to engage experts on numerous taxa, which put constraints on the use of all available expertise.

Because of varying availability and quality of data in different hotspot countries, the local experts took a different approach to KBA delineation in each case. For example, the expert team in Kazakhstan took a decision to keep delineation in line with well-defined units, mainly protected areas, hunting areas and sites with well defined ecologically boundaries (such as lakes).

The expert team in China used a similar approach, but expanded or modified the boundaries of several sites with a view towards more effective management, and also considered administrative divisions and powers. For example, in the Tarim River basin, sandwiched between the high mountains and the Taklamakan desert, there exist large, ancient agricultural oases recognized as IBAs. However, the question of KBA delineation here (as in other agricultural lands in the hotspot that are quasi-private) was a challenge, because the land ownership is a mosaic. The solution used here was to group multiple land holdings within a single KBA boundary based on ecological criteria. This was considered a legitimate

approach from a management perspective, since the local administration in charge of land and nature conservation could be a lead actor in promoting biodiversity conservation within production landscapes.

In Uzbekistan, the expert team extensively applied their field knowledge to KBA delineation decisions that combined official management units (i.e., protected areas or forest management units) with ecological units that sometimes stretched well beyond them. This was the case for Western Gissar Mountains KBA, which is centered on but extends beyond Gissar Strict Nature Reserve. In the opinion of the expert team, a larger management unit would allow more effective conservation actions for the KBA trigger species than if the site was sub-divided into several separate KBAs. The comprehensive recommendations of a UNDP-GEF project on the expansion of the national protected area network in Uzbekistan also informed KBA delineations.

A similar approach was used in Tajikistan, where some KBAs boundaries were fully aligned with protected areas, while others expanded beyond them, with the intention that existing protected areas could be expanded into or take responsibility for conservation management in adjacent areas of habitat. In Kyrgyzstan, most KBAs were defined within protected area and the forestry management units around them.

In the section of the hotspot within Turkmenistan, only three KBAs were identified. Two of these were based on IBAs, whose boundaries were followed with no changes in delineation. The third KBA, Koytendag Mountains, which is triggered by numerous taxa, is centered on a strict nature reserve and includes the species management areas attached to it. In Afghanistan, the largest KBA, Wakhan National Park, is well defined geographically, while the smaller Afghan Ishkashim KBA was defined ecologically, and needs further research and refinement.

4.2.4. Site Outcomes in the Hotspot

A total of 167 KBAs, covering a combined area of 180,495 square kilometers, were identified during the ecosystem profiling process (Appendix 4, Figures 4.1 to 4.8). All the countries of the hotspot have KBAs within their borders. Tajikistan and Uzbekistan have the most by number, with 38 each, while China has the greatest combined area of KBAs, equivalent to 31 percent of the total. Afghanistan and Turkmenistan have the fewest KBAs, due to the relatively small area of these countries included within the hotspot boundaries. Because of the data limitations discussed in the previous section, there is no doubt that further desk research and fieldwork as part of projects or targeted research grants would improve the quality of KBA delineation and identify additional global KBAs in the hotspot.

Of the 167 KBAs identified during the ecosystem profiling process, **144 are confirmed, global KBAs** (Table 4.2). These cover an area of 149,130 square kilometers, equivalent to 18 percent of the total area of the hotspot. The remaining 23 KBAs support globally threatened species, restricted-range species or other elements of biodiversity relevant to the KBA criteria but the available data are insufficient to determine whether they meet the thresholds for the global KBA criteria. These sites are therefore considered “candidate” site outcomes: KBAs with unresolved global/regional status. The same applies to a further 16 IBAs within the hotspot boundaries, for which recent data on populations of trigger species were unavailable, making it impossible to determine whether they met the global KBA criteria or, instead, qualified as KBAs at the regional level. An additional 24 IBAs are located within 50 kilometers of the hotspot boundaries. These IBAs were not analyzed during the profiling process, and their global/regional status remains unresolved. The final confirmation of global KBAs will only occur when

they are entered into the global database of KBAs (http://www.keybiodiversityareas.org) after the profiling process is complete; additional peer review may be required at this time.

Table 4.2. Number and area of KBAs in the hotspot

Country	Number of confirmed global KBAs	Total area of confirmed global KBAs (km^2)	Number of KBAs with global/ regional status not confirmed	Total area of KBAs with global/ regional status not confirmed (km^2)	Number of IBAs with global/ regional status not confirmed (within the hotspot)	Number of IBAs outside the hotspot (global/ regional status not confirmed)
Afghanistan	1	10,000	1	1,000	0	2
China	14	28,400	15	28,085	0	4
Kazakhstan	23	21,380	2	175	1	8
Kyrgyzstan	32	20,610	0	0	2	2
Tajikistan	35	38,950	3	2,035	8	0
Turkmenistan	3	2,960	0	0	0	0
Uzbekistan	36	26,830	2	70	5	8
TOTAL	**144**	**149,130**	**23**	**31,365**	**16**	**24**

Figure 4.1 Map of KBAs in the Afghanistan part of the Mountains of Central Asia Hotspot

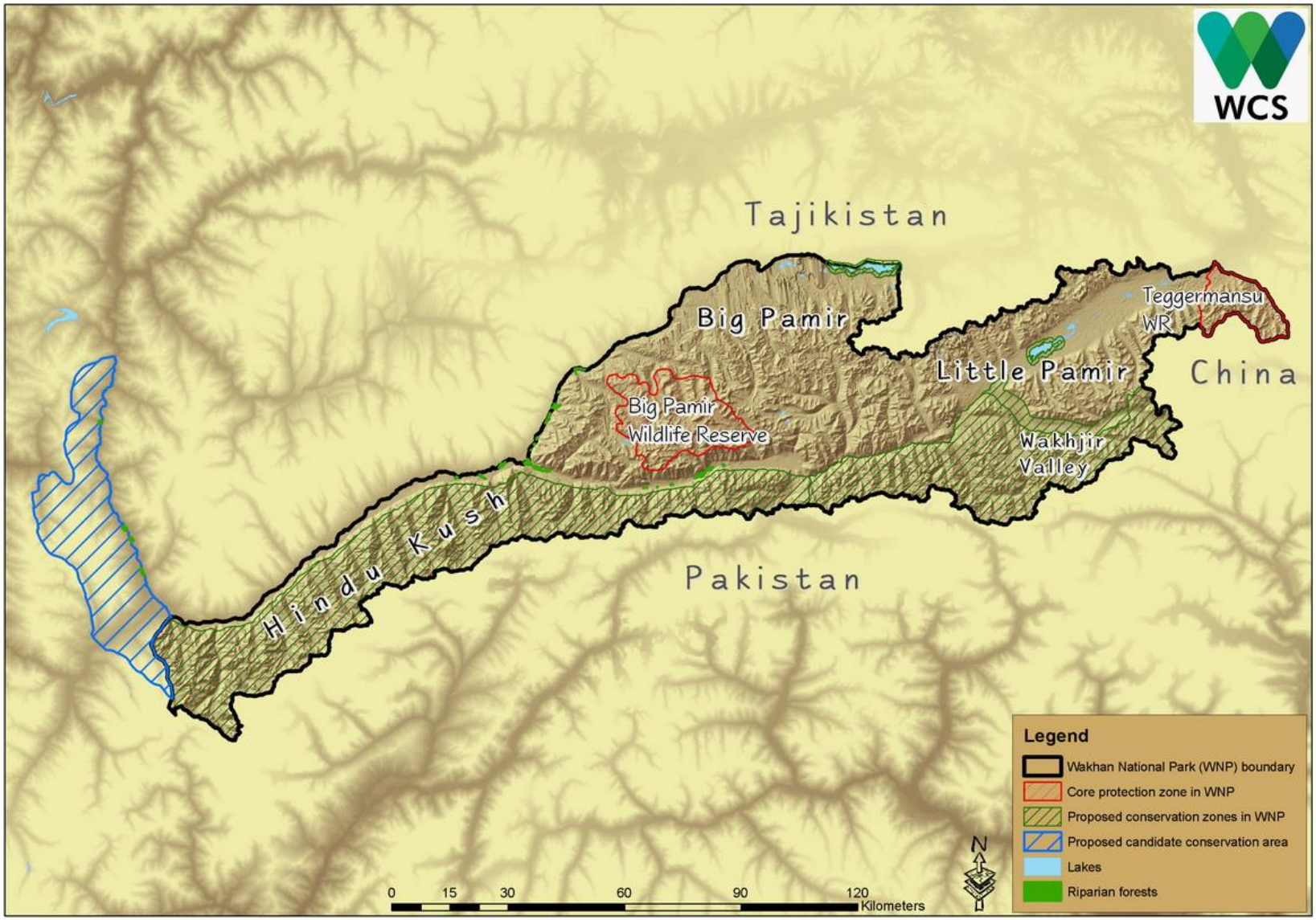


Table 4.3. KBAs in Afghanistan

Code	KBA name
1	Wakhan National Park

Figure 4.2 Map of KBAs in the China part of the Mountains of Central Asia Hotspot

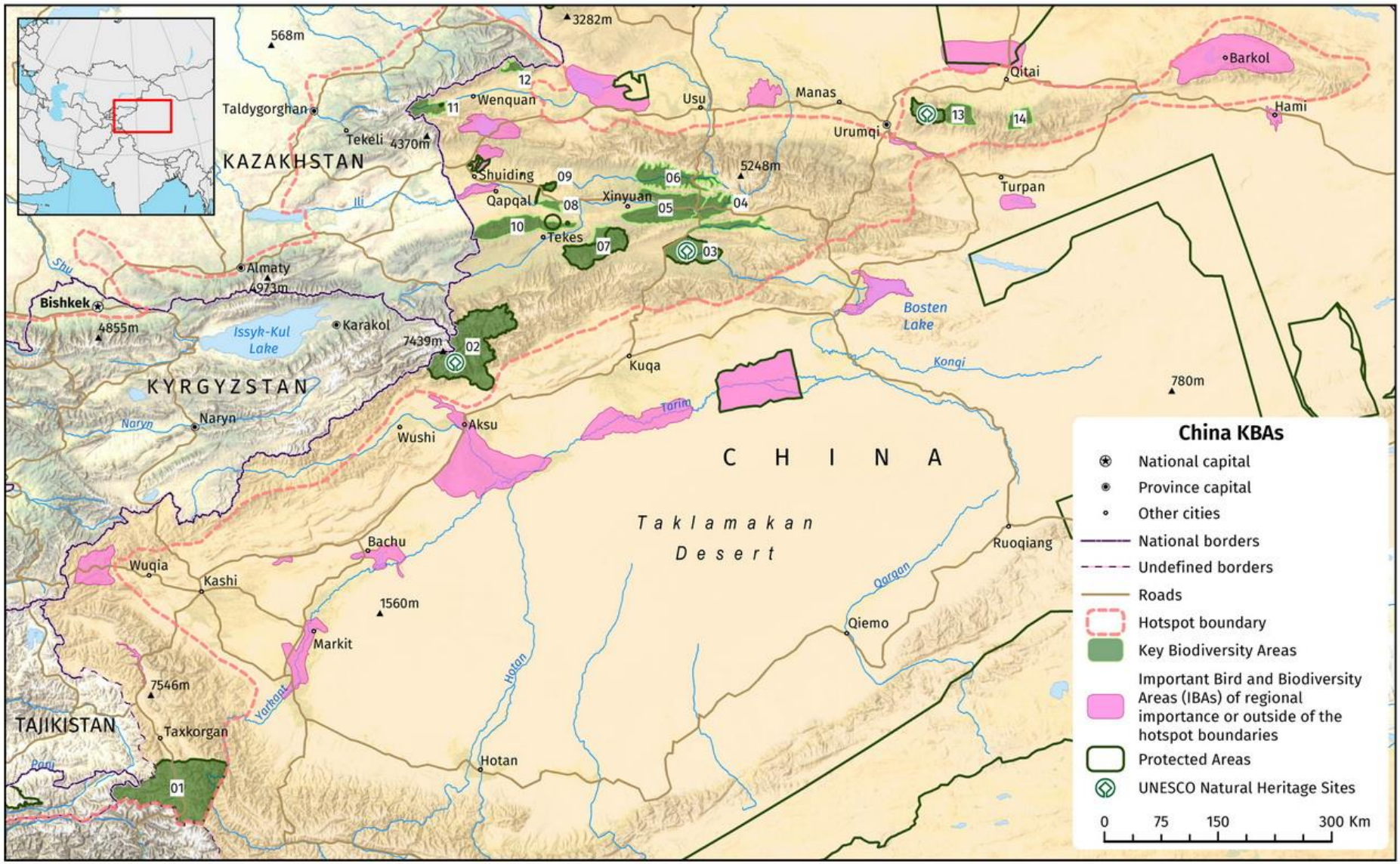


Table 4.4. KBAs in China

Code	Terrestrial KBA
1	Pamir Plateau Nature Reserve
2	Tuomuer Nature Reserve
3	Bayanbuluke and Kaidu River Valleys
4	Kunes forest
5	Nalati Prairie Nature Reserve
6	Tangbula Forest
7	Gongliu Wild Fruit Forest Nature Reserve
8	Ili River Basin

Code	Terrestrial KBA
9	Yining Xiaoyebaila Nature Reserve
10	Xitianshan Nature Reserve
11	Wenquan Nature Reserve and River Basin
12	Xiaerxili Nature Reserve
13	Tianshan Tien Chi Lake (Bogdashan) Nature Reserve
14	Jiangbulake Forest

Figure 4.3. Map of KBAs in the Kazakhstan part of the Mountains of Central Asia Hotspot

Note: The crosshatched areas represent “state reserved zones for nature”. These do not correspond to any IUCN category. Such areas allow for multiple economic activities, as well as providing core protected zones. In general, these fall outside of the hotspot but they are relevant in the national context.

Table 4.5. KBAs in Kazakhstan

Code	Terrestrial KBA
1	Karatau
2	Kyzylkol
3	Arystandy
4	Turkestan
5	Ugam
6	Tolebi
7	Boraldai
8	Aksu-Zhabagly
9	Chakpak Pass and Ters-Ashchibulak Reservoir
10	Berikkara
11	Merke
12	Aksay

Code	Terrestrial KBA
13	Almaty Nature Reserve
14	Issyk
15	Assy Plateau
16	Kolsai
17	Toraigyr
18	Narynkol
19	Tuzkol
20	Charyn Park
21	Altyn-Emel
22	Koksu
23	Zhongar-Alatau

Figure 4.4. Map of KBAs in the Kyrgyzstan part of the Mountains of Central Asia Hotspot

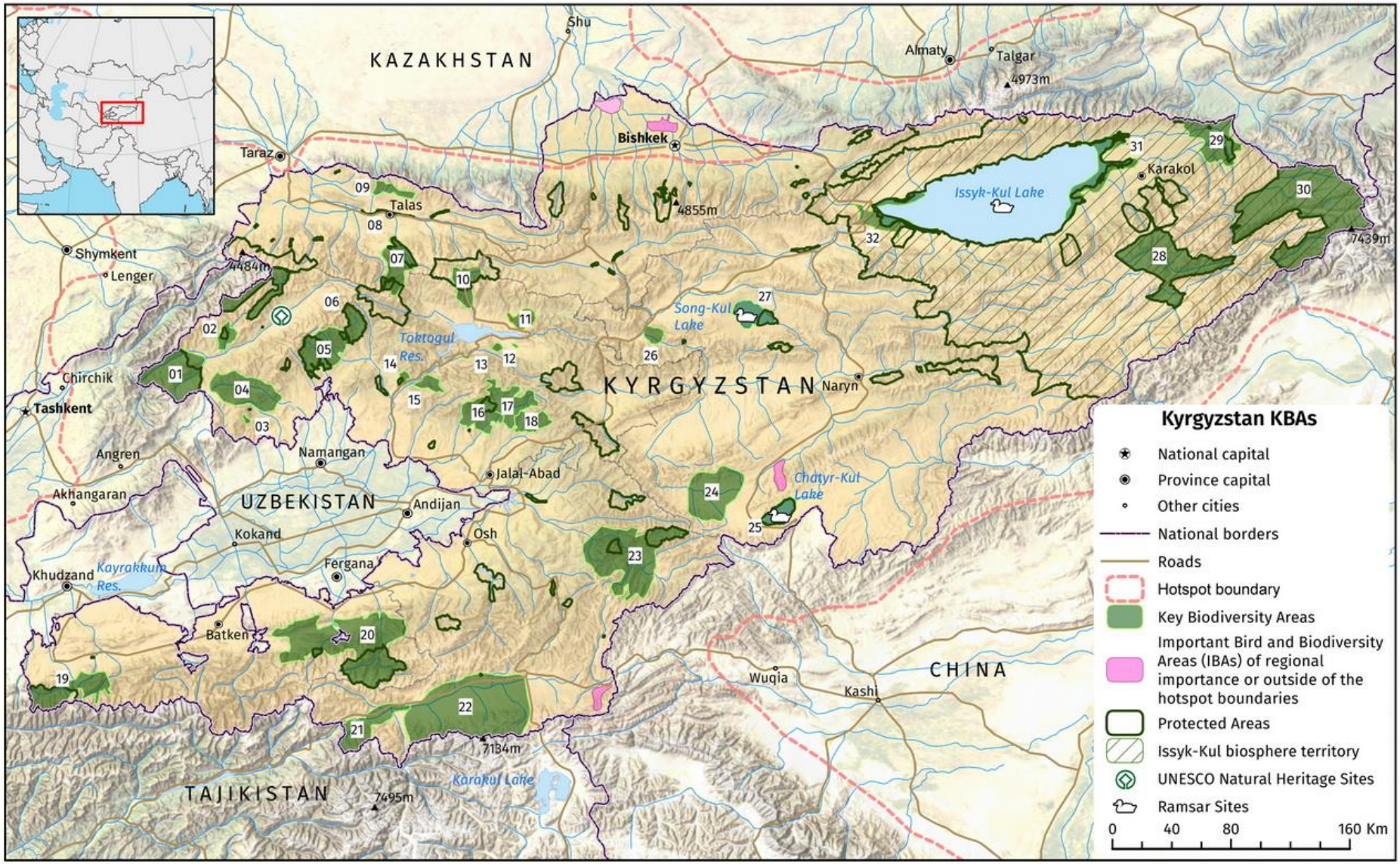


Table 4.6. KBAs in Kyrgystan

Code	Terrestrial KBA
1	Besh-Aral
2	Chandalash
3	Sumsar
4	Kassan-Sai
5	Aflatun-Padyshata
6	Sary-Chalek
7	Besh-Tash
8	Talas River
9	Nyldy
10	Chychkan
11	Torkent-Kara-Jygach
12	Sargata
13	Karasu
14	Kurp-Sai
15	Bekechal
16	Dashman

Code	Terrestrial KBA
17	Kyzyl-Unkur
18	Bazar-Korgon
19	Leilek
20	Isfairam-Shakhimardan
21	Tuz
22	Alai Valley
23	Alai-Kuu
24	Ak-Sai
25	Chatyr-Kul Lake
26	Kavak-Too and Moldo-Too
27	Son-Kul Lake
28	Kumtor and Sarychat-Ertash
29	Karkyra
30	Sary-Djaz
31	Eastern Issyk-Kul Lakeshore
32	Western Issyk-Kul Lakeshore

Figure 4.5. Map of KBAs in the Tajikistan part of the Mountains of Central Asia Hotspot

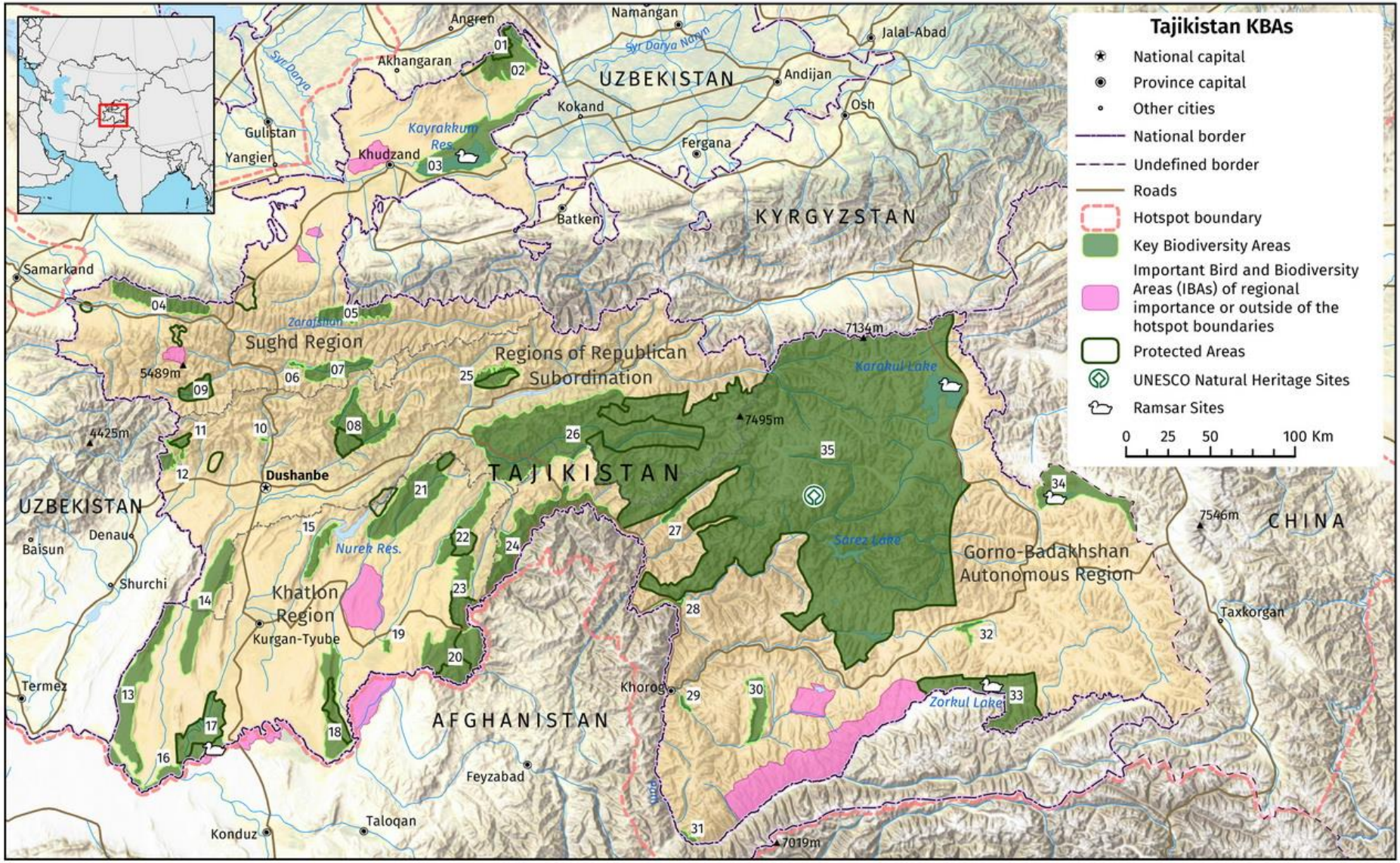


Table 4.7. KBAs in Tajikistan

Code	KBA name
1	Aktash
2	Asht
3	Kayrakum
4	Turkestan Mountains Southern Slope
5	Upper Zeravshan
6	Yagnob
7	Upper Gissar
8	Ramit
9	Sarikhadang
10	Kondara
11	Shirkent
12	Karnay
13	Tajik Babatag
14	Gazimalik
15	Sarsaryak
16	Ayvaj
17	Tigrovaya Balka
18	Tajik Karatau

Code	KBA name
19	Khojamumin
20	Kushvoristan
21	Baljuvan
22	Muminabad
23	Dashtijum
24	Darvaz
25	Kamarou
26	Tavildara
27	Vanj
28	Rushan
29	Shakhdara
30	Kudara
31	Ishkashim
32	Alichur Valley
33	Zorkul Mountains
34	Shorkul Lake
35	Tajik National Park

Figure 4.6. Map of KBAs in the Turkmenistan part of the Mountains of Central Asia Hotspot

Table 4.8. KBAs in Turkmenistan

Code	Terrestrial KBA
1	Koytendag
2	Tallymerjen
3	Zeyid Reservoir and Kelif Lakes

Figure 4.7. Map of KBAs in the Uzbekistan part of the Mountains of Central Asia Hotspot

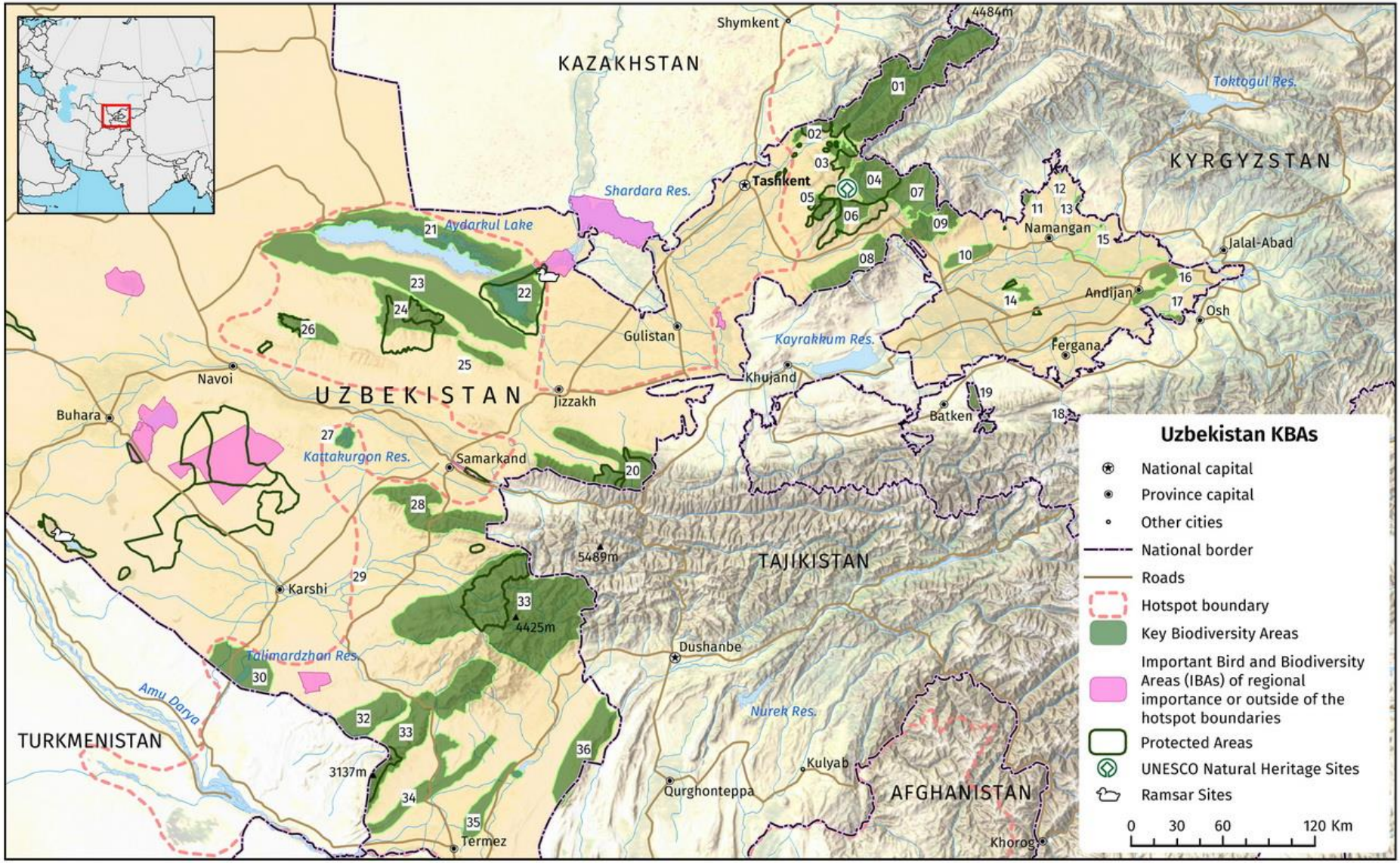


Table 4.9. KBAs in Uzbekistan

Code	KBA name
1	Pskem River Basin
2	Karzhantau Ridge
3	Chimgan
4	Akbulak River Basin
5	Bashkyzylsay River Basin
6	Karabau and Dukentsay River Basins
7	Angren Plateau
8	Northern Slope of the Kuramin Ridge
9	Upper Reaches of Chadak and Chorkesar Rivers
10	Pap Foothills
11	Karatag
12	Ungor Tepa
13	Chartak Foothills
14	Akkum Sands
15	Syr Darya Upstream
16	Teshiktash Foothills
17	Chilustun and Kyrtashtau Mountains
18	Shakhimardan

Code	KBA name
19	Sokh
20	Northern Slope of the Turkestan Mountains
21	Northern Aydarkul
22	Tuzkan Lake
23	Northern Piedmont Plain of Nuratau Ridge
24	Nuratau Ridge
25	Koytash Ridge
26	Aktau Ridge
27	Kattakurgan Reservoir
28	Western Zeravshan
29	Chimkurgan Reservoir
30	Talimarjan Reservoir
31	Western Hissar
32	Tarkapchigay River Basin
33	Kugitang and Baysuntay Ridges
34	Kelif-Sherabad Range
35	Khaudaktau
36	Uzbek Babatag

Figure 4.8. Overview map of KBAs in the Mountains of Central Asia Hotspot

4.3. Corridor Outcomes

Conservation corridors are large-scale spatial units necessary to maintain ecological and evolutionary processes. Corridors were identified with a view to: meeting the area requirements of wide-ranging species; maintaining ecological connectivity among KBAs; ensuring the uninterrupted delivery of key ecosystem services; and enhancing resilience of ecosystems to climate change. Twenty-five conservation corridors were identified during the ecosystem profiling process, covering a combined area of 576,800 square kilometers, equivalent to 67 percent of the area of the hotspot (Appendix 5, Figure 4.9). The 25 corridors include 154 of the 167 KBAs identified in the hotspot. The remaining 13 KBAs mostly comprise isolated islands of habitat, such as wetlands.

The conservation corridors range in size by two orders of magnitude, reflecting variation in the appropriate scale of landscape-level conservation approaches in different ecosystem types. The smallest corridor, the Upper Amudarya and Panj River, covers 1,600 square kilometers along the borders of Afghanistan, Tajikistan and Uzbekistan. The largest corridor, the Pamir-Alai and Wakhan Mountains, covers 122,000 square kilometers centered on the Pamirs.

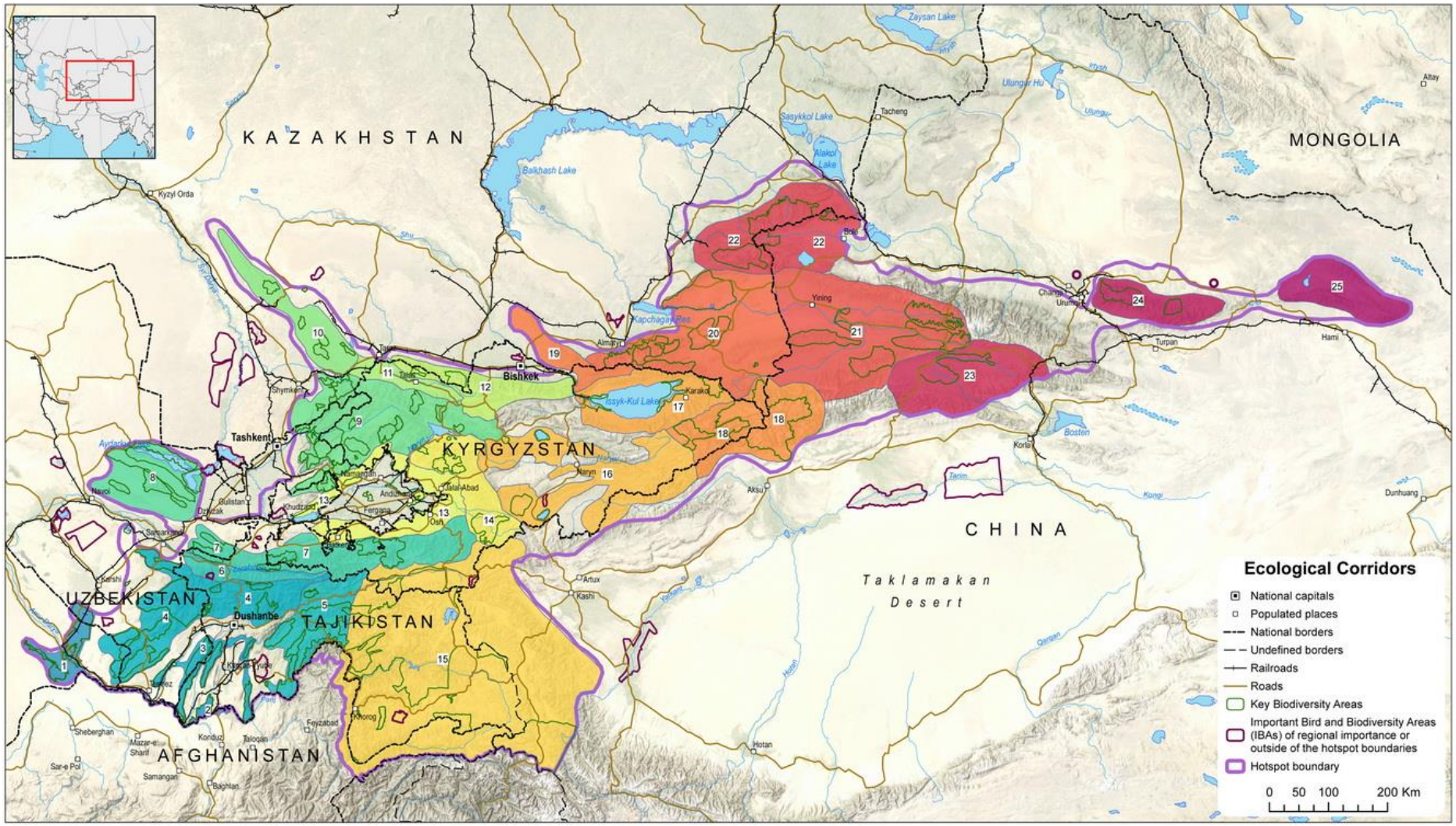
The Kelif-Talimarjan-Termez corridor, shared by Turkmenistan and Uzbekistan, mainly consists of wetlands. Its KBAs are important for threatened and wetland-dependent species. As is the case with several other corridors, CEPF could support coordinated efforts on both sides of the border so that conservation actions are well aligned, effective and collaborative. Further upstream, cooperation in the Upper Amudarya and Panj River corridor may help to strengthen exchange of biodiversity information and conservation experience between Afghanistan and Tajikistan.

Two other corridors on the edge of the hotspot are Aidarkul Lake and the Nuratau Mountains corridor in Uzbekistan and the Karatau Mountains corridor in Kazakhstan. Both are important for the conservation of endemic plants and animals requiring sufficient area of habitat for dispersal and migration routes. Linking fragmented habitats is very important for these species's conservation needs.

A rich diversity of species and habitats is found in the Koytendag Mountains corridor, shared by Turkmenistan and Uzbekistan, and good potential exists for cross-border collaboration. The Central Tajikistan corridor includes broadleaf forests, wild-fruit-and-nut forests, steppes and cliffs. These habitats are of high biological importance, with many threatened and endemic species. Agriculture and infrastructure expansion threaten the KBAs here. Hence, better-coordinated conservation efforts and increased engagement with the private sector and government land-use planning processes may help to reduce the growing pressures on these KBAs, complementary to any site-level actions that could be implemented in parallel.

The Upper Talas River Basin and the Kyrgyz Mountains corridors are both shared by Kazakhstan and Kyrgyzstan. These corridors host numerous endemics, including fishes, but receive little conservation attention. Given that endemic fishes are distributed in a linear way along the rivers, the ecological corridor approach is appropriate to their conservation. The local population in the Talas River basin is concerned about possible pollution by planned mining developments and disruptions to water supply due to river diversions for agriculture. The two countries have established the Chu-Talas River Commission, which could be a possible mechanism for cooperation at higher levels across the international border. The ecosystem profile team informed the commission about KBAs and IBAs in the area their biological importance. Both corridors require further research to identify KBAs and engage stakeholders in their management.

Figure 4.9. Overview map of conservation corridors in the Mountains of Central Asia Hotspot



Note: The representation of corridors in the figure above reflects three elements: biological and ecological (for migration routes, continuous habitat areas, areas of connectivity between KBAs, already established cooperation landscapes – all largely analyzed and mapped by WWF ECONET); political (i.e., in terms of viability); and otherwise-agreed-upon official corridors (e.g., snow leopard landscapes approved by ministers).

Table 4.10. Corridors in the Mountains of Central Asia

Code	Corridor name
1	Kelif-Talimarjan-Termez wetlands
2	Upper Amudarya and Panj River
3	Babatag and Karatau Mountains
4	Koytendag and Hissar Mountains
5	Central Tajikistan
6	Upper Zeravhan River Basin
7	Turkestan and Alai Mountains
8	Aidarkul Lake and Nuratau Mountains
9	Western Tien Shan
10	Kazakh Karatau Mountains
11	Upper Talas River Basin
12	Kyrgyz Mountains
13	Ferghana Valley Periphery (including KBAs inside the Ferghana Valley)
14	Ferghana Mountains
15	Pamir-Alai and Wakhan Mountains
16	Central Tien Shan
17	Issyk-Kul Lake Basin
18	Khan-Tengri and Tomur Mountains
19	Chu Ili Divide
20	Middle Ili River Basin
21	Upper Ili River Basin
22	Dzungaria
23	Bayanbuluke
24	Bogdashan Mountains
25	Barkolshan Mountains

The Turkestan and Alai Mountains corridor comprises several separate mountain ranges, which comprise a single ecological network of mountain habitat with many endemic species and well-preserved ancient juniper forests. While several KBAs have been identified in each country sharing the corridor (Kyrgyzstan, Tajikistan and Uzbekistan), further efforts at the landscape level are needed to identify and confirm additional KBAs, refine the delineations and designations of existing ones, and exchange experience and information on the conservation of juniper forests. The main threats to biodiversity within the corridor include overexploitation of wild plants, overgrazing (which causes soil erosion and prevents forest regeneration), and illegal tree cutting.

The Western Tien Shan and the Pamir-Alai and Wakhan Mountains corridors area each shared among four countries: the former among Kazakhstan, Kysrgyzstan, Tajikistan and Uzbekistan; and the latter among Afghanistan, china, Kyrgyzstan and Tajikistan. They contain, between them, 38 KBAs, equivant to 22 percent of the KBAs in the hotspot. Both corridors are characterized by high levels of endemism and are large enough to support viable populations of wide-ranging species, like snow leopard and ungulates, into the long term. Landscape-level conservation approaches are very appropriate here, as these can increase the efficiency of conservation efforts across national borders and increase resilience to climate change, which may shift habitats to higher elevations, alter species composition and cause other disruptions.

The Khan-Tengri and Tomur Mountains corridor, shared by Kyrgyzstan, Kazakhstan and China, are equally important for snow leopard conservation, and provide opportunities to contribute to ongoing and planned conservation efforts. The high elevations (3,000 to 7,000 meters above sea level), remoteness, and complicated access make individual initiatives difficult, hence synergies with existing programs are recommended.

The Ferghana Mountains corridor in Kyrgyzstan includes significant examples of the wild-fruit-and-nut forests that are characteristic of this part of the hotspot. Considering that an estimated 200,000 people live within these forests, which are spread over large areas, a landscape-level approach to conservation, involving forest users and sustainable forest management associations, is appropriate.

The Ili River Basin is shared by Kazakhstan (middle and lower parts) and China (upper part). Due to the large size of each section and the number of important KBAs in each, a decision was made to define the upper and middle parts of the basis as separate corridors (the lower part being outside of the hotspot). In this way, conservation actors in the two countries can work individually with clusters of KBAs, with the shared task of sustainable use and development of the Ili River basin, while coordinating efforts on conservation of priority species and ecosystems they have in common, such as wild apple forests.

The Dzungaria corridor, shared by Kazakhstan and China, hosts endemic and threatened species, as well as some of the best remaining examples of wild apple forests in the hotspot. Coordinated actions may help to improve the persistence of the threatened and endemic species and prevent pressures growing.

The Bayanbuluke corridor is a UNESCO World Heritage site, famous for its iconic wetland ecosystem, which is facing growing pressures from development. The landscape approach may help in better integrating conservation objectives into development planning.

Areas around the Bogdashan Mountains corridor, near Urumqi city, are densely populated and more and more industrialized. Industrial pollution, growth in infrastructure and mass tourism pose major threats to ecosystems here. Given these threats, the potential exists for tackling land use and

development issues at a landscape scale, an approach that will allow for greater connectivity in the corridor, and address the challenges outside the KBAs, in addition to site-level actions within them.

4.4. Recommendations for Improving the Outcomes Analysis

The following actions are priorities for improving the effectiveness of the definition of conservation outcomes:

- Conduct new studies and publish existing studies to describe species and clarify the taxonomic status of known species. Promote digitalization of the wealth of data from the Soviet period, in order to integrate these with modern data.
- Complete or update national Red List assessments that could be fed into the global IUCN Red List for more species in the region, with special emphasis on those species groups that have not yet been widely assessed, data-deficient species with limited ranges, and assessments based on data older than 10 years.
- Carry out fieldwork to improve knowledge of the status, population size, and distribution of threatened and narrowly endemic species. Identify restricted range species, and review how well these are covered by the initial network of KBAs compiled by the profile team.
- Develop a data sharing mechanism to locate, store and facilitate access to all relevant data on species, sites and project activities, and use this to periodically reevaluate the conservation outcomes and monitor progress.

5. SOCIOECONOMIC CONTEXT OF THE HOTSPOT

This chapter provides a socioeconomic overview of the hotspot and an analysis of how socioeconomic factors affect conservation outcomes. The analysis covers population demographics, income and poverty, the relationships between natural resources and the main economic sectors, and the cultural differences that have relevance to conservation.

The hotspot is a fragmented and sensitive region politically and socio-economically but all countries share deep cultural links. The five former Soviet republics also share a common communication language (Russian) and cultural, political, and economic history. There are obvious differences in economic power and stability when comparing countries across the hotspot, from China to Afghanistan. As a whole, the populations are relatively young and rapidly growing. Urban populations are growing across the region, and particularly in China; nonetheless, more than half the people of Afghanistan, Kyrgyzstan, and Tajikistan live in rural areas and are directly dependent upon natural resources.

Population growth and high population density causes increasing demand for land and water resources, and has the potential to increase fragmentation of habitats and increase overexploitation of biological resources. Conservation efforts in the region need to address population pressures on the land and resources by mitigating infrastructure development risks and supporting sustainable rural livelihoods.

5.1. Population

The Mountains of Central Asia hotspot is home to between 60 and 64 million people (Figure 5.1). Most are young (median age 17-25) and living along the main rivers or oases. By 2050 the population in the region may approach 90 million or more (UN DESA, 2015). The Ferghana Valley has the highest rural population density in Central Asia. Kyrgyzstan and Tajikistan are particularly noteworthy: their populations in 1950 were each about 1.5 million, and today, they have 6 millon and 8.5 million people, respectively. Their populations continue to grow rapidly due to high birth rates and improving quality of life, with some predictions seeing Krygystan grow by another 25 percent and Tajikistan by another 75 percent by 2050 UN DESA (2015). Meanwhile, due to improved quality of life and migration, the population of Xinjiang has grown from 4 million in 1950 to 20 million today.

Table 5.1. Population in the Hotspot, 2015

Country	Population within hotspot (million)	Density per km^2	Annual population growth (percent)	Population increase 2000 - 2015 (percent)	Rural population as percent of total*
Afghanistan	0.05	1-2	2.4	no data	100
China	17.5-20	16-20	-1.1	15	56
Kazakhstan	6-7	8-16	1.1	20	50
Kyrgyzstan	6	30	1.6	20	64
Tajikistan	8.5	60	1.9	30	73
Turkmenistan	0.05	10	1.3	20	90
Uzbekistan	22	50-500	1.1	20	50
Total	**60-63.5**	**70**			

Source: national and local statistics. Column 4/Annual Population Growth refers to growth nationwide, not population growth exclusive in the hotspot.

Nomads work the high mountain pasture of Kyrgyzstan and China and the semi-desert areas of Turkmenistan and Kazakhstan pursuing a centuries-old lifestyle reshaped by modern conditions. In addition to the capital cities and other urban centers, some areas such as the Ferghana and Zarafshan Valleys are a mix of urban and rural. The population in the rapidly growing Chinese area of the hotspot has jumped from about 1.5 million in 2000 to more than 3 million today in Urumqi city alone. Notably, the relative number of ethnic Han Chinese in the region has grown from six percent in the 1950s to 40 percent today.

Despite major urban centers in each of the countries, the population within the hotspot is predominately rural and dependent upon agriculture. The use of agrichemicals and extensification of agricultural land are both common, and rural needs are still supplemented by collection of firewood, fruits and nuts, and medicinal plants.

Noted in Chapter 3, the region is the source of several major rivers, including the Amu Darya, which feeds the Aral Sea. Downstream from the mountains, and outside the hotspot, there were serious droughts in the 1990s and again in 2000-2001, which led to population displacement (UNEP and ICSD 2006), and some people permanently moving back into the mountain regions (UNESCO 2013). The relationship between population and water in the region remains dynamic and complex.

During the 1950s and the 1970s, the Soviet Union orchestrated the resettlement of the mountain dwellers of Tajikistan to the lowlands for the purposes of land development and cotton cultivation. Some of the migration was forced, and some voluntary, but in any case, whole mountain communities were abandoned for many years. At the time of independence, about half of the forced migrants from the resettlement program returned to their old villages. Migration back to mountain communities in Tajikistan was further spurred, beginning in the 1990s, by civil unrest, lack of arable land, and scarcity of fuelwood in the lowlands (University of Central Asia *et al.* 2012).

The collapse of the Soviet Union changed the economic relationship of the newly independent countries, leading to wholesale deficits and surpluses of employment. The result was that many working-age men moved from rural Kyrgystan, Tajikistan, and Uzbekistan to major cities in Russia and Kazakhstan in search of work. In turn, that led to women in rural areas taking on new roles for income generation and household and community leadership. Naturally, instability within any of the countries has led to further population movement in search of work, and motivations are obvious: average wages in Russia or Kazakhstan can be five to ten times higher than in Kyrgystan or Tajikistan, for example.

Xinjiang stands in contrast to the other parts of the hotspot, where government incentives have led to in-migration from other parts of China, and the province has booming agricultural and industrial sectors. Also interesting is Chinese immigration into the five former republics, as people follow jobs in energy, road construction, and mining (Azattyk 2013; Olimova 2012).

The collapse of the Soviet Union and subsequent population movement changed the ethnic proportions within the countries, particularly in Kzakhstan, Kyrgystan, and Tajikistan. Where the Russian language was the official and dominant language only two decages ago, its use is becoming increasingly uncommon. However, in the five former republics, written legislation, popular television, and international meetings are all still in Russian. In Xingjian, Chinese and Uyghur are the official languages for meetings and legislation, but numerous minority languages are also spoken, and the business and academic communities speak Russian and English.

5.2. Income

Post-independence in the 1990s led to rapid changes and overall economic decline in the region, and at the same time, there was civil war in Afghanistan. However, in the 2000s, the countries stabilized and benefited from global economic growth. The countries with fossil fuels grew even more, leading to increased incomes in related sectors such as manufacturing. Labor movement and new economic relationships also led to new services in banking and trade. By the period of 2013-2016, with a drop in the prices of commodities, oil, and gas, state income in Kazakhstan, Turkmenistan, and Uzbekistan became constrained, led to a greater national focus on job creation. Meanwhile, Afghanistan focuses on security, peace, and stability, with the related impact on employment and household welfare.

Table 5.2. Economic statistics for the countries in the hotspot

Country	GDP per Capita 2015	Percent Annual GDP Growth, 2010-2015	Net ODA Received, 2014 (millions)	Net ODA Received as % of GNI, 2014
Afghanistan	$600	1-2	4,823.3	23.3
China	$14,300*	8-12*	960	0
Kazakhstan	$10,500	1-5	88.4	0
Kyrgyzstan	$1,100	3-8	624.1	8.6
Tajikistan	1,000	4-7	356.3	3.1
Turkmenistan	$6,900	6-10	34.2	0.1
Uzbekistan	$2,100	8	24.4	0.5

Sources: World Bank and national statistics
Note: *Xingjian only

5.2.1. Poverty

With the fall of the Soviet Union, poverty in the region rose to as high as 80 percent (UNDP Kyrgyzstan 2002; UNDP Tajikistan 2012; UNECE 2013). Donor support was critical at the peak of the poverty and humanitarian crisis, especially in the Tajik Pamirs. Subsequently, poverty has rapidly declined, but Afghanistan, Kyrgystan, and Tajikistan are still worse off than their neighbors (in part due to past conflicts, and in in part due to the countries lacking major natural resources and relying on small-scale industry and agriculture). Poverty levels in Kazakhstan and Turkmenistan are below 5-10 percent (UNECE 2013) and in Uzbekistan, poverty has been almost halved over the past fifteen years to 15 percent (UNDP 2016).

As is typical in most countries, the areas that are the most remote and/or with the greatest remaining natural habitat and biodiversity, are also the areas with the lowest income and literacy. Among the hotspot countries, however, overall, only Afghanistan qualifies as “low” per the Human Development Index (HDI) (Table 5.4).

Public engagement in environmental and policy is informed by the HDI – people are not highly informed, motivated, or engaged, and while information might be available online, it is often incomplete or difficult for lay-readers to understand.

Table 5.4. Poverty and human development indicators in the hotspot countries

Country	Human Development Index Rank, 2015 (out of 188)	Life Expectancy (Years)	Percent in Poverty (2012-2015)	Adult Literacy Rate (percent)	Gender Inequality Index Rank, 2014 (out of 185)
Afghanistan	171	51	36	38	152
China	90	75	no data	96	40
Kazakhstan	56	70	10	100	52
Kyrgyzstan	120	70	35	100	67
Tajikistan	129	67	38	99	69
Turkmenistan	109	70	5	100	No data
Uzbekistan	114	73	14	100	No data

Sources: UNDP, World Bank.

5.2.2. Remittances

During Soviet times, the Central Asian republics enjoyed economic support that spread through all layers of society, including infrastructure, education, healthcare, science, and industry. The republics were part of a common market for sales and consumption. This allowed for subsidies that helped remote areas (for example, in the form of social security, employment, transportation, and commodity prices). With independence, loss of subsidies, and population movement in search of work, remittances became a new source of income that improve economic security in the short run (ILO, 2010). This is especially true for Tajikistan, with a million people (12 percent of the total population) living and working in Russia; Uzbekistan, with 1.5-2 million people (five percent of the total population) in Russia; and 500,000 Kyrgyz citizens (10 percent of the total) in Russia. Tajikistan officially reported between $2.5-3.5 billion in remittances over the period of 2010-2015; Uzbekistan's are twice that (although they contribute a smaller proportion of GDP). Remittances from Russia to Kyrgystan, Tajikistan, and Uzbekistan combined in 2013 were over $12 billion, showing the region's continued reliance on this income. Economic turbulence in Russia in 2008-2010 and again in 2015-2016 have had serious impacts on remote mountain communities in Central Asia.

5.3. Reliance on Natural Resources

The hotspot has abundant natural resources: rivers for hydropower and irrigation; canyons and plateaus that allow for wind power; oil, gas, and coal in China, Kazkhstan, Uzbekistan, and Turkmenistan. Economic development has relied on these renewable and non-renewable resources; however, exploitation of these resources has had environmental consequences in sensitive mountain ecosystems.

Irrigated agriculture has long been vital to food and fiber production. Extensive agricultural development, mechanized development, and use of fertilizers, pesticides, and herbicides has led to polluted discharge in new inland water bodies, called "solonchak" ecosystems, such as Aidar Lake in Uzbekistan and Sarykamysh Lake in Turkmenistan. Where irrigation does return to the main rivers – the Syr Darya and Amu Darya – the downstream effects on ecology and human health have been dire. In turn, concerns about water quality and quantity have led to interstate or inter-communal tensions.

The use of wildlife and conservation areas as a source of income does exist, but the system of management is mixed betweenpublic and private, individual and organizational. The governments tend to view the value of protected areas as having low economic value (e.g., limited to the value of trophy hunting), although these areas do have obvious value for their ecosystem services. Conflict between competing interests – conservation of tracts of land versus its use for mining, energy, or infrastruce – is common (FLERMONECA, 2015).

5.3.1. Agriculture

The area of cultivated land rapidly increased in the five republics from the 1960s to 1990s, and more recently in Xinjiang. The major zones of agriculture -- Ferghana, Tarim, Chu-Talas, Zeravshan – all rely on irrigation. With climate change, the area is increasingly vulnerable to drought and soil degradation.

With independence, the five Central Asian governments transitioned collectively-owned farms to quasi-private ownership and long-term private rental. As a result, the number of formal farming units skyrocketed: over 350,000 private farms in Kyrgystan and 130,000 in Tajikistan. This also led to an income gap between those who had sufficient arable land and those who did not. In turn, agricultural cooperatives have been formed to collectively own machinery for more efficient planting, harvesting, and processing.

In rural parts of the hotspot, agriculture is still practiced at a household level, although in China, Uzbekistan, and Turkmenistan, the state plays a much stronger role throughout the sector.

Historically, those in the Pamir raised more crops than livestock, while pastorialists in the Tien Shan and Wakhan relied more on meat and dairy production. However, with changing economic patterns led to changes in what people produce – and eat. There is now less land for livestock and dairy, and more land devoted to production of grains and potatoes.

Capricious weather can have a big impact on those reliant on cash crops like apricots, wild forest products, home gardens, or subsistence crops. Nomadic communities can suffer cattle losses from harsh winters or dry weather. Rolling losses and crop unpredictability can affect entire provinces and lead to grievances and dissatisfaction.

The Xinjiang Uyghur Autonomous Region is well known for its fruits and other agricultural produce including grapes, melons, pears, cotton, wheat, silk, walnuts and sheep. Around seven percent of the land is utilized for agriculture. Animal husbandry now accounts for nearly 30 percent of local agricultural output value. Region-wide, the net annual per capita income of farmers was reported at around $500.

Some readers might associate the region with mechanized and industrial agriculture, thinking of the Soviet era or soy production in Brazil. This type of agriculture certainly exists in the seven countries, but within the hotspot itself, much of this methodology has been replaced since the break up of the Soviet Union. Many former cotton fields produced with industrial systems under state control now produce grains under control of smaller-scale cooperatives. Of course, these farms represent a threat on mountain slopes, but the incentives to which they respond are different than industrial farms. The legacy of the past remains in the decimation of the Aral Sea, salinized soil, erosion, and the resettled people who supported those systems. Otherwise, large-scale farming exists for irrigated agriculture in the lowlands, and for large wool, dairy, and meat operations.

Some readers might also associate the region with the growth of poppy or illicit crops. Growing poppy for opium production is a crime throughout the region, and historically has fallen under strict state control measures in all but Afghanistan. Even within Afghanistan, while the province of Badakhshan (overlapping the hotspot) has an estimated 6,000 hectares of poppy (UNODC, 2016), the Wakhan Valley, itself, is considered poppy-free.

5.3.2. Mineral Resources and Mining

In terms of revenue, if not employment, mining is most noteable in Kyrgyzstan, Tajikistan, and China. In Kyrgyzstan, most of the large mineral reserves are in the high mountains (above 2,500 meters), as they are in Tajikistan, where the mining reserves are less developed and the resources are not as well known. Mining and metallurgy contributes up to 50 percent of the national export earnings in Tajikistan (aluminum and gold) and up to 30 percent in Kyrgyzstan (mainly gold).

A series of changes in the operators of the mines, local perceptions of broken promises, dubious hiring practices, compensation inequities, and environmental damage have all hardened resistance to mining in Kyrgyzstan (Bogdetsky *et al.* 2012). The benefit-sharing arrangement between mining projects, central government, and local communities, and the lack of transparency in the distribution of income remains a lingering cause of resentment. The conflict between the use of land for traditional pasture and grazing, nature conservation, and for mining activities is also a source of friction in Kyrgyzstan. The melting of glaciers and permafrost in the mountains is complicating the infrastructure and waste management requirements of mining operations (Torgoev 2013).

Kyrgyzstan has purposefully created conditions favorable to mining operators by enacting economic reforms and by allowing access to geological information. Currently many companies in such territories are licensed for mining activities. Tajikistan continues to consider its geological information semi-confidential, as in the Soviet era, and its legislation and the ease of doing business lags behind Kyrgyzstan's. As a result, Tajikistan has attracted fewer investors for the development of mineral deposits. Tajikistan had been famous for silver mining from ancient times, and a recent geological audit suggests that it has probably one of the largest silver reserves in world in the Kuramin, Western Tien Shan (KBA). The government is now requesting expressions of interest from interested mining companies.

Existing laws and regulations on mining sometimes contravene the goal of environmental protection. For example, mining is sometimes allowed in riverbeds or even in the buffer zones of protected areas. Local populations are sensitive to the negative impacts of mining, if not for biodiversity conservation, then definitely for the impacts on local human health. Further, there is a perception that agricultural products from areas with mining are harmful. Local populations suffer because people from outside the area demand to pay less for these crops.

Kazakhstan, Kyrgyzstan, Tajikistan, and Afghanistan participate in the Extractive Industries Transparence Initiative (EITI). This effort promotes more participation in tenders and financial disclosure showing who is receiving the benefits of mining operaitons. However, EITI does not currently require disclosure of data on the environmental and social impact of mining on local communities.

Artisanal gold mining by local communities is not widespread in the hotspot due to tight governmental control, but it exists in Afghanistan, Kyrgyzstan, Tajikistan, and China. Artisinal mining tends to be used as a supplement rather than as a primary source of income. However, as artisanal miners begin to use machinery or mercury, the threats to the environment grow.

Kickstarted by a gold and oil rush in the 1990s, the extractive sector constitutes the largest share of GDP in Xinjiang. Fueled by enormous domestic demand, both legal and illegal mining sites are common in the region, even in areas of high conservation value.

5.3.3. Energy

Kyrgyzstan and Tajikistan have the largest hydropower potential, and both countries are actively seeking to exploit this. International financing institutions as well as Russia, China, and Iran are promoting markets for energy generation and transfer, and in some cases, are investing directly in infrastructure. China, Pakistan, India, and Afghanistan have all signaled to their Central Asian neighbors their interest in buying hydropower-generated electricity. Currently, Kyrgyzstan has 2,700 MW of installed hydrowpower and Tajikistan 5,000 MW, combined less than ten percent of their technically feasible hydropower potential. Ongoing development and planning is taking place on Kyrgyzstan's Naryn and Sary-Djaz rivers and in Tajikistan's Vakhsh, Panj, and Zeravshan.

The countries in the hotspot are using or exploring renewable sources (hydropower, solar, wind) to varying degrees, and coal-fired plants are still common. Xinjiang has large deposits of oil, including China's second largest oil field, Karamay. Natural gas from Turkmenistan and Kazakhstan flows to Xinjiang and petrochemicals account for 60 percent of Xinjiang's economy.

Like in the mining sector, major infrastructure development for hydropower attracts attention and controversy. This includes the 300-meter high Rogun Dam on Tajikistan's Vakhsh River, with construction planned to be complete in 2025-2030 and which has caused tension with Uzbekistan. The project has a lack of international investors and Tajikistan had been developing this project as a state-owned venture until July 2016 when it signed a $3.9 billion contract with Salini Impregilo, Italy. Krygyzstan is facing similar tensions with its downstream neighbors and financial constraints to develop its upper Naryn River cascade.

5.3.4. Water-agriculture-energy nexus

The tension between the highlands and the lowlands over the use of water for energy production and irrigated agriculture is a crucial issue in the region. Climate change is expected to only make a difficult situation worse.

The water resources in the Aral Sea basin and Tarim River basin are already used to such an extent that any significant stress resulting from weather extremes and climate change affects all users, especially those downstream. The water infrastructure in Central Asia was designed in the Soviet era for the region as a whole, but since independence each country owns and maintains its infrastructure with the exception of some cross-border canals, key reservoirs, and pumping stations still held in common or operated jointly (ENVSEC 2011).

The downstream states prefer to maintain the status quo in regional water management, counting on the historical hydrological baseline, water allocations, and arrangements. The upstream states would

prefer revision of the water management schemes in line with new political and economic realities (ENVSEC 2011). Individual countries now plan in their own interests instead of those of the Soviet Union, leading to lack of agreement on the meaning of "sustainable" water use.

In the post-Soviet era, there has been a lack of coordination or willingness to balance the demands of hydropower against irrigated agriculture, leading to downstream excess, or even flooding, in the winter (when the demands for power are high) and water deficits for irrigation schemes in the summer. Conversely, upstream countries suffer from lack of hydropower generation due to limitations placed by their downstream neighbors. However, mutually beneficial solutions exist, including encouraging markets for the trade of fossil fuels for electric power. Whether the countries pursue their national interests or take a collaborative approach at the regional level may determine whether tensions escalate or diminish (ENVSEC 2011).

5.3.5. Forest management

As table 5.5 shows, the percent of forest cover in the region is low, whether one looks at forests under national boundaries or at more limited data for forest cover within the portions of each country that fall within the hotspot. Lowlands have low-density saxaul species that are well adapted to the arid conditions, but are almost invisible on satellite images. There are patches of tugai forests along the rivers. The mountains are home to forests consisting of coniferous and deciduous trees with an admixture of shrubs. Most natural forests and plantations are state owned, although individuals and associations can enter long-term leases with the state and often do so for fruit and nut forests and for timber plantations. Leasing of plantations has led to increased reforestation, although there is the reisk of fencing and artificial barriers as leaseholders try to secure their holdings.

Table 5.5. Forest cover

Country	Total Forests (2015)		Forests within the hotspot
	Km^2	Percent of land area	Km^2
Afghanistan	13,500	2.1	No forests in Wakhan
China	2,100,000	22	23,350 (Xinjiang)
Tajikistan	4,080	2.9	4,080
Kyrgyzstan	8,360	4.4	8,360
Kazakhstan	34,220	1.3	No data
Turkmenistan	41,270	8.8	Marginal
Uzbekistan	30,450	7.2	No data

Sources: World Bank, FAO, national statistics.

Fuel wood is the principal source of energy for cooking and heating in the mountains, due to the lack of affordable alternatives. Other challenges to forest managements are discussed in the Chapter 8.

Forest certification schemes do not yet exist, although the Forest Stewardship Council has initiated efforts to promote sustainable, "eco-friendly" use and management of non-timber forest products (NTFPs). Overall figures on the value of the market for non-timber forest products are not available, but household collection of such products is significant.

While plantation forests certainly use non-native species in various cases, within the hotspot in general, most community plantations use local species of poplars for building materials and fuelwood, or they are using local species of fruit and nut trees. In Kazakhstan, in particular, there is even a movement to avoid using non-native apple to avoid cross-fertilization with the locally regarded native stock.

5.3.6. Tourism

With the exception Afghanistan, international and domestic tourism within the region is common, with destinations based around hot springs, ski resorts, mountaineering, rock climbing, major lake-based resorts, and cultural heritage sites. Hungting tourism is particularly important in Kyrgystan and Tajikistan. Nature parks – lakes, forests, view-sites – are all extraordinarily popular and frequently suffer from too little investment in relation to the number of visitors. Standards for ecotourism have not yet matched the need for the same.

About 80 percent of tourists are coming from within the hotspot countries. The largest source of foreign tourists is Russia, followed by people from western Europe, Turkey, and eastern Asia. Tourism from the Gulf states for niche products like falconry represent only a tiny fraction of tourism revenue. In terms of national revenue, of the seven countries, tourism represents the largest portion of the economy of Kyrgyzstan, at approximately four percent of GDP over the last decade.

Xinjiang has nearly 500 designated scenic areas, many related to Silk Road history and culture. Tourism management in China often emphasizes gross numbers of visitors instead of the quality of experience. There are over 22 million domestic tourists per year in the region, with thousands per day visiting the Tien Shan and Tianchi Lake National Nature Reserve, an hour's drive from Urumqi, and close to one million per year visiting Kanas Lake and Nature Reserve in the northern part of the province.

Authorities throughout the region see the value of nature-based tourism and understand the importance of protecting the thing people are coming to visit. However, local capacity to manage tourism is sometimes surpassed, with habitat disturbance being the negative side effect of too many visitors.

5.4. Cultural Distinctions

5.4.1. Ethnicity

The main ethnic groups are Kazakh, Kyrgyz, Uzbek, Turkmen, Uyghur, Han, Tajik and Wakhi. The Kazakh, Kyrgyz, Uzbek, Turkmen, and Uyghur live throughout the mountains and speak a series of Turkic languages. Their distribution within the region is interesting. Kazakhs are often cattle breeders in the plains and lowlands, whereas the Kyrgyz are often cattle breeders in the middle and higher altitudes. Uzbeks and Uyghurs are known for agriculture and trading. Tajiks are known for home gardens in the high mountains, and Turkmen (*teke* and *nuhura*) are known as are pastoralists of the desert. Tajiks mainly live in the Pamir in Tajikistan, Afghanistan, and China and are subdivided into several ethnic groups, including Wakhi-speaking communities in Afghanistan. Added to these are the many Eastern Europeans – predominantly Russian and Ukrainian – who came in the last centuries, plus Koreans and Han Chinese, especially in the major cities and industrial areas.

5.4.2. Religion

The dominant religion is Islam, which came to the region in the 6th-7th centuries, but was not firmly established until the 12th century. Historic religions include Zoroastrianism, Buddhism, and Tengriism, and mountain communities continue to reflect elements of animism and living in harmony with nature. During Soviet times, the practice of religion was not encouraged by the state, but with independence, religiosity returned in widely varying degrees. Differences in belief regarding whether government should be secular or theocratic have been a source of civil conflict and difficult relations. Extreme Islamic groups in Central Asia and Afghanistan have used the mountains as hiding places. The rise of radical movements has led to outbreaks of violence in some places, and the threat of fundamentalism remains a common concern for regional security (Munster and Bosch 2012; Zarifi 2011).

The region is dotted with *mazars* – Islamic pilgrimage sites – and is also home to the sacred Sulaiman-Too Mountain in Osh, Kyrgyzstan, a UNESCO World Cultural Heritage site.

5.4.3. Language

Russian remains the international language of Central Asia and is even spoken in northwest China thanks to trading links. In Kyrgyzstan, where the links to Russia are historically stronger, Russian is common in both urban and rural areas. On the other hand, in Tajikistan and Uzbekistan, there has been greater cultural separation from Russia and a stronger national identity. This, plus legal mandates to use national languages, mean that Russian is fading away in those two countries. Meanwhile, Chinese is becoming more popular among students and people with business interests. English is rarely spoken outside of major cities, and it is equally rare in government agencies or in local CSOs.

Each country in the hotspot has its own national language, in each case the language of the majority ethnic group. English language skills are generally lacking, particularly in rural populations, in government institutions and local CSOs.

Table 5.6. Ethnic Groups, Languages, and Religions within the Hotspot

Country	Main Ethnicities	Other Ethnicities	Main Languages	Main Religions
Afghanistan	Wakhi, Kyrgyz	Badahshi, Tajik, Uzbek	Wakhi, Kyrgyz, Dari, English	Islam
China – Xinjiang	Han, Uyghur	Kazakh, Hui, Kyrgyz, Mongol	Mandarin, Uyghur, Kazakh, Kyrgyz	Islam, local regions
Kazakhstan	Kazakh	Russian, Uyghur	Kazakh, Russian, Uyghur	Islam, Christianity
Kyrgyzstan	Kyrgyz	Uzbek, Russian, Dungan, Tajik	Kyrgyz, Russian, Uzbek	Islam, Christianity
Tajikistan	Tajik	Uzbek, Russian, Kyrgyz, Turkmen	Tajik, Russian, Uzbek	Islam
Turkmenistan	Turkmen	Uzbek	Turkmen, Russian, Uzbek	Islam
Uzbekistan	Uzbek	Tajik, Russian, Kazakh, Uyghur	Uzbek, Russian, Tajik	Islam

Table 5.6 summarizes the primary or notable ethnicities, languages, and religions *within the hotspot portion* of each country. Certainly, there are dozens of languages and religions, and hundreds of ethnicities, across these seven countries. Even in the limited fashion presented here, the table demonstrates the diversity of the region and suggests the need for specialized outreach and communication during implementation of a grants program.

5.4.4. Gender

The role of women varies across the region, and the differences in gender – in terms of gender development, inequality, and life-course gaps – are reflective of the varying levels of development of each country (UNDP 2016). A detailed analysis of gender in the context of biodiversity conservation in each country is not possible within the scope of this document; however, the role of women (e.g., the relationship of women to decision-making on natural resources; barriers to women and women's organizations in organizational management) is certainly a factor in the CEPF investment priorities discussed in Chapter 12. Further, summary data from the UNDP Human Development Report (2016) and the most recent OECD Social Institutions and Gender Index (2014) provide a useful overview and insight into the differences between the countries and some of the opportunities and limitations.

Table 5.7 shows selected indicators from the UNDP and OECD. Of note, Afghanistan and Uzbekistan both have relatively high inequality (UNDP Gender Inequality Index) and along with Kyrgyzstan, have a poor differential in terms of women's ability to control resources (SIGI restricted resource value scored as "high"). On the positive side, Kazakhstan, Kyrgystan, Tajikistan, and Uzbekistan all show high rates of female secondary education. Overall, the indices show that in each country, there are multiple issues involved in terms of engaging women in conservation or in terms of promoting gender equity in natural resources management. These issues include female education, acceptability of women to manage natural resources, acceptability of women in the non-agricultural work-force, and acceptability of women in leadership and managerial positions, at the least.

Table 5.7. Selected Gender Indicators from the UNDP 2016 Human Development Reports and the OECD 2014 Social Institutions and Gender Index

Country	Human Development Index Rank	Gender Development Index	Gender Inequality Index	HDI Female	Female % of paid employment in non-agriculture	Female managers (% total)	Female secondary education %	SIGI Category	SIGI Restricted Resources Value
Afghanistan	169	.609	.667	.348	n.a.	n.a.	8.8	High	High
China	90	.954	.164	.718	37.7	16.8	69.8	Medium	Medium
Kazakhstan	56	1.006	.202	.795	50.6	38.4	99.7	Low	Medium
Kyrgyzstan	120	.967	.394	.648	42.3	35.2	100	Medium	High
Tajikistan	129	.930	.322	.604	n.a.	n.a.	98	Medium	Low
Turkmenistan	111	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Low
Uzbekistan	105	.946	.672	.672	n.a.	n.a.	99.9	Medium	HIgh

5.4.5. Indigenous People

Other than in Afghanistan, the concept of “indigenous people” with enshrined legal rights is difficult to address and is informed by past and current state policies that promote national identities, even while celebrating ethnic differences. Thus, there remote mountain populations of Yagnobi in Tajikistan, and Uyghurs and many others in Xinjiang, but by law, these people have no special privileges or limitations as any others. On the other hand, in the Wkhan Valley and larger Badakshan Province, ethnicities of Wakhi, Shugnani, Ishkashimi, and Yazgulyami may have special customary rights.

CEPF should not expect limitations to engagement based on ethnicity or a group’s status as “indigenous,” but will need to proceed cautiously if it tries to promote legal rights of a particular ethnic group in a way that contravenes state policy.

6. POLICY CONTEXT OF THE HOTSPOT

This chapter reviews the main environment-related national, regional, and global policies and agreements being applied in the Mountains of Central Asia Hotspot, provides an overview of governance in each of the countries, and highlights national biodiversity strategies. Further discussion of policy is addressed indirectly in the Risk Analysis table in Chapter 13.

6.1. Environmental Governance

While it is straightforward to identify the government agencies in each country directly and indirectly responsible for natural resource management and conservation, it is more difficult to ascertain the political "weight" that each has. Typically, there is a divide between ministries responsible for natural resource use versus those responsible for conservation. In some countries, legislation, enforcement, and environmental control are integrated with policy making, while in others these functions are separated. Tables 6.1 to 6.7 attempt to summarize the relative "weights" and roles of primary government agencies in each country.

Decentralization presents its own complexities: often, strict nature reserves are controlled by national authorities while species sanctuaries and landscape management zones are controlled by local administrations. Afghanistan and Kyrgyzstan have the most decentralized governance systems, which in theory, puts control over natural resources closer to the people who use them – a positive outcome. However, it has led to situations where local authorities sometimes wish to exploit land for short-term gain while national authorities are promoting conservation.

6.1.1. Afghanistan

In Afghanistan, the National Environmental Protection Agency (NEPA) is the government body with overall regulatory power and policy making on environmental issues. It regulates, coordinates, monitors, and enforces environmental laws. NEPA exercises an oversight role for the management of conservation landscapes and protected areas (Table 6.1).

Table 6.1. Conservation-related governance arrangements and functions in Afghanistan

Function	NEPA	MAIL	MEW	Other	Local authorities
Biodiversity policy	Major	Medium	Lesser	Lesser	Lesser
Species monitoring	Medium	Medium	Lesser	Medium	Lesser
Species protection	Major	Major	Lesser	Lesser	Lesser
Protected areas	Major	Major	Lesser	Lesser	Lesser
Forests	Medium	Major	Lesser	Lesser	Lesser
Water management	Lesser	Medium	Major	Medium	Medium
Pollution control	Major	Medium	Medium	Lesser	Lesser
Environmental law enforcement	Medium	Medium	Lesser	Lesser	Lesser

The Ministry of Agriculture, Irrigation, and Livestock (MAIL) includes a subordinate General Directorate on Natural Resources Management that manages protected areas, forestry, and rangelands. The Ministry of Energy and Water (MEW) is responsible for planning, management, and data collection of water resources, as well as facilitating water governance at the river basin level.

In many cases, responsibility for biodiversity conservation is divided among multiple state agencies; consequently, overlapping powers and lack of cooperation between institutions are common. Government structures mandated to protect biodiversity are understaffed and operate with insufficient budgets, and employees, particularly in remote areas, often lack the knowledge and skills necessary for effective conservation. Poor pay, difficult conditions, low motivation and training, and lack of incentive mechanisms all lead to underperformance.

6.1.2. China

The part of China within the hotspot is formally known as the Uygur Autonomous Region of Xinjiang. In Europe, historically it was known as Chinese Turkistan, as distinct from Russian Turkistan. It is the largest sub-national administrative region in China and is broken down into prefectures, municipalities, and counties, each of which has varying levels of autonomy. Thus, understanding whether decision-making takes place in the provincial capital (Urumqi), Beijing, or elsewhere depends on the issue at hand. For example, land areas along borders, or very large land areas with multiple resources, are often controlled by Beijing, whereas smaller land units in less sensitive areas are typically controlled by provincial level authorities.

China's State Council, appointed by the National People's Congress, has ultimate responsibility for the country's environment. The State Council authorizes the Ministry of Environmental Protection (MEP) to coordinate and monitor the management of biodiversity conservation. Its responsibilities include formulating laws, regulations, compiling national programs and specifications, formulating management regulations and standards for nature reserves, and supervising the conservation of rare and threatened species. MEP is responsible for the implementation of international environmental conventions, including the CBD (Table 6.2).

Table 6.2. Conservation-related governance arrangements and functions in China's Xingjian

Function	Ministry of Environment	State Forest Authorities	Ministry of Agriculture	State Water Authorities	Others, incl. Academy of Sciences	Local authorities
Biodiversity policy	Major	Medium	Lesser	Lesser	Medium	Medium
Species monitoring	Medium	Medium	Lesser	Lesser	Major	Lesser
Species protection	Major	Medium	Lesser	Lesser	Medium	Medium
Protected areas	Lesser	Major	Lesser	Lesser	Lesser	Major
Forests	Lesser	Major	Lesser	Lesser	Lesser	Medium
Fish resources	Medium	Lesser	Lesser	Lesser	Lesser	Lesser
Water management	Medium	Lesser	Medium	Major	Medium	Major
Pollution control	Major	Lesser	Lesser	Lesser	Medium	Medium
Environmental law enforcement	Medium	Lesser	Lesser	Lesser	Lesser	Lesser
Spatial planning	Medium	Lesser	Lesser	Lesser	Major	Medium

Responsibility for managing the majority of forests and other protected areas lies with the State Forestry Administration. Several other institutions also have biodiversity conservation responsibilities, including the Ministry of Agriculture, the Ministry of Water Resources, and the Chinese Academy of Sciences. Xinjiang formulates nature reserve development plans at five-year intervals and submits the plans to relevant central governmental agencies for approval. Central government integrates the provincial plan into the national plans.

6.1.3. Kazakhstan

In Kazakhstan, the two ministries responsible for biodiversity conservation are the Ministry of Agriculture (MoA) and the Ministry of Energy (MoE). The Committee of Forests and Fauna in the MoA is responsible for forests, protected areas system and enforcement of wildlife conservation. At the same time, the Information and Analysis Centre in the Ministry of Energy has responsibility for managing environmental records and the state cadastral records of natural resources, including protected areas, forests, and species. Its core task is to provide information to support policy formulation and inform the public about the state of the environment, including biodiversity. However, both institutions remain understaffed compared to the scope and geographic scale of work. Kazakh conservation CSOs often act as consultants or advisers for the country's biodiversity governance.

Table 6.3. Conservation-related governance arrangements and functions in Kazakhstan

Function	Ministry of Energy	Ministry of Agriculture	Others (Academia, Research)	Local authorities
Biodiversity policy	Lesser	Major	Medium	Lesser
Species monitoring	Lesser	Medium	Major	Lesser
Species protection	Lesser	Major	Medium	Medium
Protected areas	Lesser	Major	Lesser	Medium
Forests	Lesser	Major	Lesser	Medium
Fish resources	Lesser	Major	Lesser	Lesser
Water management	Lesser	Major	Lesser	Medium
Pollution control	Major	Lesser	Lesser	Lesser
Environmental law enforcement	Major	Major	Lesser	Lesser
Spatial planning	Medium	Medium	Medium	Medium

6.1.4. Kyrgyzstan

The State Agency on Environment and Forestry under the Government of the Kyrgyz Republic is the main government authority responsible for policy implementation and regulation in the area of biodiversity conservation. However, its political power is weak compared to other ministries. Most protected areas and forests are managed by this agency. The Ministry for Agriculture, Food and Land Reclamation has a leading mandate in land and water use issues. State Inspection for Environmental and Technical Safety supervises and controls the implementation of legislation and regulations on the environment, water, land, mineral and other resources. The Academy of Sciences in Kyrgyzstan plays a prominent role in species research and conservation programs.

Personnel movement and rotation within Kyrgyzstan's civil service, whether by design or not, is frequent. Such turnover means individuals are often new to their jobs, or agencies have multiple people in transition, which then impedes the performance of the agency.

Cooperation among authorities, provincial administrations, and local self-government is weak, but the level of decentralization is remarkable in Kyrgyzstan. CSOs are key partners to the state authorities in revision of legislation and policies, but contrary views and positions are not uncommon.

Table 6.4. Conservation-related governance arrangements and functions in Kyrgyzstan

Function	State Agency on Environment	Ministry of Agriculture	Others (Academia, Research)	Local authorities
Biodiversity policy	Major	Medium	Medium	Lesser
Species monitoring	Lesser	Lesser	Major	Lesser
Species protection	Medium	Lesser	Medium	Medium
Protected areas	Major	Lesser	Lesser	Medium
Forests	Major	Lesser	Lesser	Medium
Fish resources	Lesser	Lesser	Lesser	Lesser
Water management	Lesser	Major	Lesser	Medium
Pollution control	Medium	Lesser	Major (Inspection)	Lesser
Environmental law enforcement	Medium	Lesser	Major (Inspection)	Lesser
Spatial planning	Medium	Medium	Medium	Medium

6.1.5. Tajikistan

Tajikistan's Committee on Environmental Protection along with the National Biodiversity and Biosafety Center (NBBC) promote conservation, formulate biodiversity strategies, and implement conservation projects. In 2013, the State Forestry Institution, Scientific-Research Institute for Forestry, and the State Institution on Protected Areas were moved from the Committee on Environmental Protection to the newly created State Forest Agency.

Table 6.5. Conservation-related governance arrangements and functions in Tajikistan

Function	Committee on Environmental Protection	NBBC	State Forest Agency	Ministry of Energy-Water	Others	Local authorities
Biodiversity policy	Medium	Major	Medium	Lesser	Lesser	Lesser
Species monitoring	Medium	Medium	Lesser	Lesser	Medium	Lesser
Species protection	Medium	Medium	Major	Lesser	Medium	Medium
Protected areas	Lesser	Medium	Major	Lesser	Lesser	Medium
Forests	Lesser	Medium	Major	Lesser	Lesser	Medium
Fish resources	Lesser	Lesser	Lesser	Lesser	Lesser	Lesser
Water management	Lesser	Lesser	Lesser	Major	Lesser	Medium
Pollution control	Medium	Lesser	Lesser	Lesser	Lesser	Lesser
Environmental law enforcement	Medium	Lesser	Medium	Lesser	Lesser	Lesser
Spatial planning	Medium	Medium	Medium	Medium	Lesser	Medium

NBBC is perceived as the only institution in Tajikistan in possession of comprehensive information on biodiversity (most of which is publicly accessible) and is the focal point to the Convention on Biodiversity. The Academy of Sciences provides information on the status of threatened species. The Ministry of Energy and Water is in charge of energy and water policies in the country. The parliament holds a working group on the environment and is active in drafting and revising legislation. Qualified experts are in short supply, and information on the current state of species and ecosystems is generally lacking.

6.1.6. Turkmenistan

Turkmenistan's environmental governance structure, which had been stable for twenty years, was reorganized in early 2016 when the Ministry of Nature Protection was transformed into the Committee on the Protection of Nature and Land Resources under the Ministry of Agriculture and Water. This Committee is now in charge of nature protection and use policies and includes departments on flora and fauna, forestry, ecological monitoring, research, and all national nature reserves. Turkmenistan also has a formal Council of Elders that, along with the parliament, has a formal role on domestic and foreign affairs.

Table 6.6. Conservation-related governance arrangements and functions in Turkmenistan

Function	Committee on Nature Protection	Other	Local authorities
Biodiversity policy	Major	Lesser	Lesser
Species monitoring	Major	Lesser	Lesser
Species protection	Major	Lesser	Lesser
Protected areas	Major	Lesser	Medium
Forests	Major	Lesser	Medium
Fish resources	Lesser	Lesser	Lesser
Water management	Medium	Medium	Medium
Pollution control	Major	Lesser	Lesser
Environmental law enforcement	Major	Lesser	Lesser
Spatial planning	Medium	Medium	Lesser

6.1.7. Uzbekistan

Uzbekistan's State Committee for Ecology and Environmental Protection leads on biodiversity conservation and the management of protected areas and species. However, actual control falls to many bodies with poor coordination between them: the Cabinet of Ministers, the Ministry of Agriculture and Water Resources, the State Committee for Geology and Mineral Resources, and local authorities. Low salaries and a high rate of staff turnover complicate the situation.

The Academy of Sciences (Institute of Plants and Animals) is among the more capable research and conservation institutions. The Hydrometeorological Service under the Cabinet of Ministers (Uzhydromet) is home to the GEF Operational Focal Point. Uzhydromet leads on climate change response and prevention of land degradation. The Uzbek Parliament formally tasks 15 of its 150 members to serve on an environmental working group.

Table 6.7. Conservation-related governance arrangements and functions in Uzbekistan

Function	Committee on Ecology	Ministry of Agriculture-Water	Uzhydromet	Academy of Sciences	Local authorities
Biodiversity policy	Major	Lesser	Lesser	Medium	Lesser
Species monitoring	Medium	Lesser	Lesser	Medium	Lesser
Species protection	Medium	Lesser	Lesser	Medium	Medium
Protected areas	Medium	Medium	Lesser	Lesser	Medium
Forests	Medium	Medium	Lesser	Lesser	Medium
Fish resources	Lesser	Lesser	Lesser	Lesser	Lesser
Water ecosystems management	Lesser	Major	Lesser	Medium	Medium
Pollution control	Major	Medium	Medium	Lesser	Lesser
Environmental law enforcement	Major	Medium	Lesser	Lesser	Lesser
Spatial planning	Medium	Medium	Lesser	Medium	Medium

6.2. Environmental Policy

Each of the seven countries has established law and policy that theoretically supports biodiversity conservation, including legislation on creation and management of protected areas, wildlife protection, environmental regulation, and pollution controls. All have some form of:

- Ecological code / framework environmental legislation
- Protected areas law and associate regulations on management
- Flora and fauna law
- Forestry code
- Water code
- Hunting law
- Environmental impact assessment law and regulations
- Pollution prevention laws

In general, legislation in the region is robust and clear, but implementation is conducted by a diverse array of government agencies that may not be coordinated or motivated.

6.3. Protected Areas

Formal protected land within the hotspot varies by country from four percent in Turkmenistan to 22 percent in Tajikistan. The first protected areas in the region were created in the 1930s, but the system was upgraded considerably with the independence of the five former republics. During the Soviet era, protected areas were managed by Moscow, where authorities created protected areas based on geographic representation or to target specific species. Some protected areas were created in areas of dense population, which to this day creates conflicts between land users and authorities. Over time, the functioning of reserves has ebbed and flowed with economic fortunes of the Soviet Union and then the independent countries, and also based on conflict or stability in each of the seven countries (see Figure 6.1).

Figure 6.1. Protected Areas in the Mountains of Central Asia

Protected areas in the region range in size from the 1,200 hectare Gongliuyehetao Chinese Walnut Reserve to the massive Wakhan National Park in Afghanistan (1 million hectares), Taxkorgan Nature Reserve in China (1.4 million hectares), and Tajik National Park in Tajikistan (2.6 million hectares). The hotspot is also home to well-functioning legacy reserves from the Soviet era, such as Kazakhstan's Aksu-Zhabagly and Almaty reserves, Uzbekistan's Chaktal reserve, Kyrgyzstan's Sary-Chalek reserve and Issyk-Kul Biosphere Reserve, Tajikistan's Tigrovaya Balka, and Turkmenistan's Koytendag in Turkmenistan.

In addition to formally declared protected areas and national parks (corresponding to IUCN categories I-II), the region has five common designations for land with some form of conservation.

1. **Species management areas** – locally known as *zakaznik* – correspond to IUCN category IV. These are the most numerous protected areas in the hotspot, but most of them are actually "paper parks." They often lack legal status (particularly in Kazakhstan) and their management is often delegated to local authorities, although a recent trend is for oversight to be assigned to nearby national parks. This category is applied in areas with particular species or natural features. There is serious need for these areas to have greater official recognition or national-level support, better management, or changed status. They would benefit from better local citizen and decision-maker awareness about their importance and KBA status.

2. **Forestry management areas** – locally known as *leskhoz* – apply to most forest lands in the former republics and set regimes for fire management, pest control, grazing, and timber harvest. These areas tend to have well-defined boundaries, although digitized data is only available for Kazakhstan and Kyrgyzstan. Several separate *leskhoz* could be managed as a single KBA.

3. **Hunting concessions** are supervised and licensed by the state environmental authorities, and increasingly, are managed privately. These areas are valuable for conservation, but management of them varies. Not all concessions are managed for the long-term, and some are managed to promote high-value trophy species, as opposed to species that make the area important for biodiversity. On the other hand, these concessions are good at preventing poaching, with notable examples from the Dashtijum and Khushvoritan KBAs in Tajikisan leading to substantial increase in the population of the morkhur goat (*Capra falconeri*) between 2010-2015. Work remains to build trust and align priorities between concessions, communities, and government stakeholders. Kazakhstan, Turkmenistan, and Uzbekistan are frequented by wealthy visitors from Gulf countries practicing falconry hunting on Houbara Bustard. Over the last 15 years, the Kazakh government has allowed for the hunt of 80-170 birds per year on the condition that hunting fees finance species rehabilitation and conservation, and the United Arab Emirates supported a bustard nursery in 2008. Kyrgystan allows for a ceremonial hunt – the *Salbuurun* – but this appears to have no significant negative impact on vulnerable species.

4. **Mountain forests and riverbank forests** are protected by law (typically the Forest and Water Codes) and their use for commercial activities is restricted. Most are state property under national government control, although some belong to municipalities or communities. In theory, these units form the basis of possible KBAs. These areas are at risk for small-scale gold mining and gravel extraction; juniper forests tend to be over-grazed; wild fruit and nut forests tend to be overexploited.

5. **Water protection zones** – essentially rivers themselves, their riverbanks, and associated groundwater reserves (with sizes varying depending on the importance for drinking water supply or other purposes) – are legally controlled by government entities. They are protected for specific purposes, but not necessarily for conservation (e.g., for drinking water). In the context of conservation, they are important for enforcement of regulations and restrictions on land use.

In addition to these, there are other land designations that, while not targeted at conservation, still have a conservation effect. These include natural resource extraction sites, infrastructure sites, and agriculture and pasture land concessions that can sometimes prevent poaching or protect unique locations by excluding people or other development.

Non-protected state land is typically leased to households for pasture or farming on a 30-year basis. Over vast and sparsely populated areas, it is difficult for the government to control what happens on these lands.

In the five former republics and in China, "protected areas" are, by definition, state land: there are no privately-owned protected areas and there is no system of private management over areas designated for conservation, except for hunting concessions with selective conservation targets. Afghanistan is unique in the region for having community-based management as a formal element in the management of Band-e-Amir National Park and Wakhan National Park.

In 2013, Tajik National Park, in the Pamir, and three sites in the Tien Shan Mountains of China became UNESCO World Heritage sites, and in 2016, a similar designation was applied to several protected areas in the Western Tien Shan shared by Kazakhstan, Kyrgyzstan and Uzbekistan.

Appendix 4 defines the protection status of each KBA. Of note:

- In Afghanistan, the entire Wakhan valley is now a national park, but the presence of snow leopard in significant numbers and density really distinguishes the area.
- Xinjiang's protected areas are managed by the Forestry Department of the autonomous region and cover 11 million hectares. The provincial government plans to double this amount by 2013.
- Turkmenistan has received significant support for its Koytendag reserve from BirdLife International and the Royal Society for the Protection of Birds.

6.4. Regional and International Environmental Agreements and Initiatives

Table 6.8 shows the status of ratification or participation by each of the countries to the Convention on Biological Diversity (CBD), the Convention on Conservation of Migratory Species (CMS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Ramsar Convention on Wetlands (Ramsar), the World Heritage Convention (WHC), the Central Asian Countries Initiative for Land Management (CACILM), the Global Snow Leopard Programme (GLSEP), and the Central Asian Mammals Initiative (CAMI). Table 6.9 shows membership in regional agreements.

Table 6.8. Membership in international conventions and regional conservation initiatives

Country	CBD	CITES	Ramsar	CMS	CACILM	GSLEP	CAMI	UNFCC
Afghanistan	X	X		X		X	X	X
China	X	X	X			X	X	X
Kazakhstan	X	X	X	X	X	X	X	X
Kyrgyzstan	X	X	X	X	X	X	X	X
Tajikistan	X	X	X	X	X	X	X	X
Turkmenistan	X		X		X		X	X
Uzbekistan	X	X	X	X	X	X	X	XX

Table 6.9. Membership in regional environmental agreements and cooperation mechanisms

Country	Caspian Sea convention	Aral Sea basin IFAS	UNECE Water	UNECE Aarhus	EU-CA platform
Afghanistan					
China					
Kazakhstan	X	X	X	X	X
Kyrgyzstan	X	X (suspended)		X	X
Tajikistan		X		X	X
Turkmenistan	X	X	X	X	X
Uzbekistan		X	X		X

Within the five former republics, the International Fund for Saving the Aral Sea (IFAS) maintains the Inter-State Commission on Sustainable Development (ICSD). This is the main body within the five countries tasked to coordinate regional cooperation on environment and sustainable development. Each country has three representatives on the ICSD: the head of the national environmental authority, a representative from an economic affairs ministry, and a representative from the scientific community. ICSD allows for civil society to participate. ICSD has mountain ecosystem conservation as a mandate. While the entity has bureaucratic issues not atypical of international bodies, it is still an important body for sharing of information and promulgation of approach, particularly for KBAs. Since 2016, Kyrgystan has suspended its participation in IFAS processes and bodies, including ICSD.

6.5. National Biodiversity Strategies and Action Plans

The Convention on Biological Diversity requires countries to prepare and regularly revise National Biodiversity Strategies and Action Plans (NBSAPs) as the principal instruments for implementing the Convention at the national level. The main elements of each country's NBSAP are summarized here.

6.5.1. Afghanistan

Afghanistan's NBSAP includes the following elements.

1. To continue ongoing assessments of Afghanistan's floral and faunal communities, with the overall aim of improving understanding of Afghanistan's biodiversity resources and their conservation requirements.
2. To expand the protected areas system to ensure that it is representative of all major ecosystems and areas of outstanding conservation or natural heritage value.

3. To develop and implement the support mechanisms (incentives, rules, regulations, environmental education, public awareness) necessary for the effective conservation of biodiversity and other natural resources.
4. To develop the mechanisms required for effective conservation of important species.
5. To develop and implement mechanisms to ensure sustainable use of biodiversity resources, including funding, capacity and policy considerations.
6. To prevent the illegal or unsustainable use of biodiversity resources.
7. To develop and implement mechanisms for preventing damage to natural ecosystems from invasive alien species.
8. To control impacts on biodiversity resources resulting from climate change, desertification and pollution.
9. To develop and implement mechanisms and plans for maintaining goods and services obtained from critical ecosystems, focusing on forests and woodlands.
10. To maintain cultural diversity by recognizing and valuing traditional knowledge.
11. To manage genetic resources for the benefit of all citizens of Afghanistan.
12. To ensure that government organizations have sufficient capacity and resources to carry out Afghanistan's obligations as a signatory to the CBD and other Multilateral Environmental Agreements.

6.5.2. China

China's NBSAP highlights the following:

1. Further improve related policies, regulations and systems on biodiversity conservation.
2. Promote mainstreaming of biodiversity conservation into related planning processes.
3. Strengthen capacities for biodiversity conservation.
4. Strengthen in-situ conservation of biodiversity and rationally carry out ex-situ conservation.
5. Promote sustainable development and use of biological resources.
6. Improve benefit sharing of biological and genetic resources and traditional knowledge.
7. Improve capacities to cope with new threats and challenges to biodiversity.
8. Raise public awareness and strengthen international cooperation and knowledge exchange.

China's NBSAP further highlights the Tianshan-Jungar Basin and the Tarim Basin with priorities for Xinjiang including:

- Establish and integrate nature reserves to expand the network of nature areas, taking into consideration bio-geographical units such as mountains, watersheds, and deserts.
- Strengthen protection of desert and grassland ungulates such as wild camels, argali, as well as rare birds and their habitats such as bustards, crane, stork, gull.
- Improve the conservation of rare and endemic fish and their habitats.
- Reinforce protection of the gene resources of wild fruit trees, including wild apple and apricot.
- Provide protection of unique desert species such as *haloxylon, poplar diversifolia, tetraena, savin juniper*, and *herba cistanches*.
- Document and research on the traditional medical knowledge of minorities.

6.5.3. Kazakhstan

Kazakhstan's NBSAP highlights the following:

1. In-situ conservation of biological diversity.
2. Accounting for and socio-economic assessment of the country biological capacity and its balanced use in the legal framework.
3. Expanding the genetic fund, and providing genetic independence and biological safety.
4. Establishing conditions for conservation of the genetic fund of agricultural crop varieties, including for agricultural animals and for making agricultural land more productive.

6.5.4. Kyrgyzstan

Kyrgyzstan views the conservation and sustainable use of its biodiversity in terms of service to the sustainable socioeconomic development of the country. The NBSAP identifies four strategic targets:

1. Integrate biodiversity conservation issues into the activities of state bodies and public organizations by 2020, as the basis of human well-being and the sustainable economic development of the Kyrgyz Republic.
2. Reduce the impact on biodiversity and promote its sustainable use.
3. Improve the protection and monitoring of ecosystems and species diversity.
4. Improve the social importance of biodiversity and ecosystem services, increase the benefits of sustainable ecosystem services, and traditional technologies.

6.5.5. Tajikistan

The main goal of Tajikistan's strategy is "to preserve and manage biodiversity and to conserve ecosystems, thus providing for the sustainable economic and social development of Tajikistan." The NBSAP includes the following elements:

1. Biodiversity conservation in-situ and ex-situ.
2. Regeneration and conservation of the genetic pool of plants and animals.
3. Providing biological safety of the country.
4. Sustainable use of biological resources to reduce poverty and to improve quality of human life.

6.5.6. Turkmenistan

The overall aim of Turkmenistan's NBSAP is "to conserve, restore and sustainably use the biological diversity of Turkmenistan for present and future generations." The strategy highlights the following:

1. To integrate biodiversity conservation into all relevant governmental programs.
2. To revise and develop nature protection laws in accordance with the CBD.
3. To reduce the relative level of environmental pollution by 20 percent through the revision and improvement of nature protection laws.
4. To halt the process of degradation of natural landscapes in 30 percent of Turkmenistan.
5. To preserve the existing state of the forests and restore 5 percent of their area.
6. To increase the level of public awareness on the importance of biodiversity to 50 percent and increase level of ecological education by 10 percent.

7. To increase improve the management of protected areas and increase coverage by six percent.
8. To improve the conservation of agricultural biodiversity and ex situ conservation.
9. To develop and introduce economic incentives to increase local people's interest in biodiversity conservation.
10. Increase investment by 30 percent for the scientific capacity of institutions related to biodiversity conservation.

6.5.7. Uzbekistan

According to Uzbekistan's Fifth National Report to the Convention on Biological Diversity, the country's NBSAP has the following objectives:

1. Improvement of the system of the protected areas, including organization of an ecologically sustainable and diverse protected area system, with coverage of at least 10 percent.
2. Awareness of society, public participation, and education to achieve adequate understanding and recognition of the importance of biodiversity for sustainable development.
3. Sustainable use of biodiversity resources to achieve the maximal meeting of economic, scientific, recreational, and cultural demands of all people in Uzbekistan, providing simultaneous conservation of biological diversity and viability of ecosystems in the long-term.
4. Implementation of regional and local Action Plans on biodiversity in the context of the general framework of the Action Plan for development, including development of provincial action plans, which reflect more specifically regional and local demands and problems.
5. Coordination of international relations and assistance in the sphere of biological diversity through development of an organizational structure on professional and managerial issues compatible with international and regional legislation and agreements on biodiversity

7. CIVIL SOCIETY CONTEXT OF THE HOTSPOT

CEPF was founded with an understanding that the engagement of civil society leads to more effective and sustainable conservation outcomes, and CEPF's fundamental role is to make grants to civil society organizations who then implement conservation programs. This chapter summarizes civil society "sector" in the region and the possible roles that CSOs might play in conservation.

CEPF defines civil society as all the national and international nongovernment actors that are relevant to the achievement of conservation outcomes and strategic directions. This includes, at least, local and international conservation NGOs; economic and community development NGOs; scientific, research and academic institutions; professional organizations; producer and sales associations; religious organizations; media; advocacy groups; outreach, education and awareness groups; formal and informal schools; social welfare agencies; indigenous groups and indigenous rights groups; land reform groups; and the parts of the private sector concerned with the sustainable use of natural resources.

The capabilities, niches, and areas of activity of civil society organizations vary among the hotspot countries. Conservation- and mountain-focused organizations in Central Asia have a rich history. With climate change becoming a more prominent issue internationally, many CSOs have started to integrate green energy, landscape and ecosystem adaptation, climate-resilient development, and agricultural practices into the scope of their activities. Because of CSO engagement, the Important Bird and Biodiversity Areas of Central Asia have been mapped; multiple national parks, reserves and lake shores have been better cared for; and, flagship species have been better protected and monitored.

In general, the trend in the region is one of greater government control over CSOs, particularly since a high point of civil society engagement following the dissolution of the Soviet Union. The reasons for this are many and can be sensitive, but include issues of democratic governance, ethnicity and religion, and perceived and real threats from abroad and from within countries. The end result is that there are now more requirements for organizational and project registration than in the recent past. Nonetheless, CSOs are generally welcome to engage at the local level, particularly for biodiversity monitoring, environmental education, public awareness, and to demonstrate "best practice" from abroad.

Comparing across countries, Turkmenistan and Uzbekistan have the strictest rules for the engagement of CSOs via support from international donors. Scientific institutes in these two countries have high standards and adequate funding from national authorities, while CSOs play a role in protection of flagship species and education. In both countries, funding from international entities to local NGOs must be first approved by appropriate authorities.

Engagement of civil society in Xinjiang is prescribed in various ways. Academic and scientific organizations, such as the Academy of Science and universities, receive the most funding and have the greatest ability to conduct field work, especially compared to smaller and independent groups, which are underrepresented.

Perhaps at the next level are Tajikistan and Kazakhstan. Tajikistan's environmental CSOs are largely based in Dushanbe, or in Khorog, in the heart of the Pamir Mountains. A significant amount of climate change money coming into the country flows to CSOs to work on adaptation and disaster risk reduction. Local CSOs and public groups are also active in species surveys, support for protected areas, conservation of agro-biodiversity, and sustainable development and forestry projects. Kazakhstan has numerous CSOs in its various large ecosystems (e.g, northern steppes, southern deserts, mountains).

Those focused on the mountain environment are in Almaty and south-east Kazakhstan (Shymkent, Taraz, Ustkemen), in the foothills of the Tien Shan and Altai Mountains. Many have offices in the capital city, Astana, outside the hotspot, to maintain links to the government and donors. Kazakh CSOs play an active role play an active role in environmental regulation and legislation, implement field projects, and conservation efforts and maintain regional and international relations.

CSOs in Kyrgyzstan and Afghanistan can engage in the broadest array of activities. CSOs in Kyrgyzstan have played a significant role in shaping biodiversity legislation and strategies, and in improving the network of protected areas. However, there is a growing conflict between conservation aims and development aims, particularly around the Ferghana Valley and the western and central Tien Shan, and this is reflected in the types of CSOs operating, respectively in Osh, Jalal-Abad, and Batken. Afghanistan is perhaps a special case, coming off a period of transition, with so many new governance structures and so much decentralization, that there are numerous roles for CSOs to fill. However, compared to the other countries in the region, national-based CSOs in Afghanistan have low capacity and suffer the most from geographic distance and instability.

Table 7.1 lists a sample of national-based (i.e., "local") CSOs by work area and country.

Table 7.1. Selected CSOs with Links to Biodiversity Conservation

Technical Area	Examples of CSOs
Land, Water and Nature Resources Rights; Right of Access to Justice and Environmental Information	**Kazakhstan**: Green Salvation, Burabay and Almaty Aarhus centres, Eco-Atameken, Farmer of Kazakhstan, Eco-Forum Kazakhstan, Ecom **Kyrgyzstan**: Independent Ecological Expertise, Lesik-South, Akbulak, Osh and Bishkek Aarhus Centres, Rural Development Fund **Tajikistan**: Association of smallholder farmers, Azal, Surkhob, all Aarhus centres in the country (seven Aarhus centres in total) **Uzbekistan**: Union for the Defense of the Aral Sea and Amudarya, Armon, Zarafshan, Shakhimardon, Salomatlik-Ecology, Tinchlik Suv, Chashma Suv, Okar Bulok, Obi Zam Zam, Fergana Canal Water Users Association, CSO "For ecologically clean Fergana"
Local development	**Kazakhstan**: Biogen **Kyrgyzstan**: CAMP Alatoo, AGOCA, numerous jamaats **Tajikistan**: Shifo, Jovid, CAMP Kukhiston
Artisans and traditional crafts	**Tajikistan**: Komroni **Kyrgyzstan**: CBT (Community Based Tourism) network, numerous organizations around Issyk Kul Lake, One Village One Product **Turkmenistan**: Toranny
Children and youth	**Kazakhstan**: Almaty Aarhus Centre, Ak-Bulak, Ecology-Youth-Initiative-Development Foundation, Human Health Institute **Tajikistan**: Dushanbe Aarhus Centre, Globe, Little Earth, Parastor, Youth Ecological Center, Youth of the new century, Zumrad **Uzbekistan**: Rodnichok, Eko-maktab
Women and gender	**Kazakhstan**: Association of Women of the Orient, Kazakh National Committee of the UNESCO Man and Biosphere **Tajikistan**: Alternative, Avesto, Bonu, Elyor, Women for Science and Progress, Zan va Zamin **Uzbekistan**: Zienur

Technical Area	Examples of CSOs
Ecological tourism and business opportunities	**Kazakhstan**: Avalon, Kazakhstan Agro-Forestry Association, Kazakhstan Hunters and Fisherman Society and Kansonar, Business Arsenal, Thetis Society **Kyrgyzstan**: CBT (Community Based Tourism) network, numerous organizations around Issyk Kul Lake, One Village One Product **Tajikistan**: Ruhafzo
Biodiversity conservation	**Afghanistan**: Wildlife Conservation Society, Rupani Foundation **China**: Institute of Geography and Ecology and numerous nature societies and associations (geographic, botanic, wildlife, tourism) **Kazakhstan**: Association for Conservation of Biodiversity of Kazakhstan (ACBK), Naurzum, Jabagly-Manas, Institute of Zoology, GIS-Terra, Thetis Society, Snow Leopard Foundation in Ust-Kemen, Institute of sustainable development **Kyrgyzstan**: Kyrgyz Association of Land and Forest Users, Kyrgyz Wildlife Conservation Society, BIOM, Ecological movement Aleyne+, GLIP, Academy of Sciences, Kyrgyz society of hunters and fishermen, Tabyat-South, Plateau Perspectives, numerous jamoats **Tajikistan**: Nature protection team, Kukhiston, Tajik Association for the Protection of Forests and Wildlife, Noosfera, CSO "Genetic Resources," Tajik Hunters Society **Turkmenistan**: Turkmen Society of Nature Protection, Turkmen Society of Hunters and Fishermen, Institute of deserts **Uzbekistan**: Uzbekistan Society for the Protection of Birds (UzSPB), Eko-maktab, Institute of plants and animals under Academy of Science
Mountain development	**Kazakhstan**: Eco-Gradient **Kyrgyzstan**: Central Asian Mountain Partnership, Alliance of Central Asian Mountain Communities (AGOCA), Regional Mountain Centre **Tajikistan**: Hamkori Bakhri Taraqiyot, Tajik Social and Ecological Union, CAMP Kukhiston, CAMP Tabiat
Environmental education and awareness	**Kazakhstan**: Green Salvation, Almaty and Burabay Aarhus Centres, Institute of sustainable development, Jabagly-Manas **Kyrgyzstan**: Tree of Life, Independent Ecological Expertise, Regional Center of expertise for education for sustainable development, Muras Bashaty, Bishkek and Osh Aarhus Centres **Tajikistan**: "Foundation for Support of Civil Initiatives (FSCI), Little Earth, Youth Ecological Center, Youth of the new century, Zumrad **Turkmenistan**: Arhus Centre of Turkmenistan, Tebigy Kuwwat **Uzbekistan**: "For ecologically clean Fergana" Association, Logos, Uzbek Society for the Protection of Birds, Eko-Maktab

The text below addresses CSOs in each country, although there are commonalities in the "sector" in each. All have "local" CSOs covering smaller parts of the country, "national" CSOs covering the majority of the country, "regional" CSOs with offices or partners in multiple countries, and "international" CSOs that are based outside the hotspot. These CSOs face similar challenges, to varying degrees:

- National government controls, limitations monitoring, and inspections.
- Limited technical and organizational capacity.
- Lack of recurrent or sustainable funding.
- Differing and challenging donor requirements, including different major languages (English, Russian, Chinese) and donor expectations.

7.1. Afghanistan

In Afghanistan, where community-based approaches are a fundamental component of political and institutional structures (e.g., via formal Community Development Councils, or CDCs), and are enshrined in environmental legislation, CSOs are partners in all types of development and conservation strategies. As a result, and despite some policy and the practical limitations of remoteness, there are many small CSOs working in concert with international NGOs and government.

The Natural Resource Management Department of Aga Khan Foundation in Afghanistan is supporting poverty reduction, improving rural livelihoods, and environmental conservation, all via community-based natural resource management groups working under CDCs. Similarly, the Rupani Foundation works supports community forestry and environmental education in Badakhshan. The challenge for CEPF is that the groups supported by Aga Khan and Rupani are typically very small and typically do not meet CEPF organizational requirements for receipt of funds.

There are various national NGOs based in Kabul, like Environment Watch Afghanistan and the Afghanistan Environmental Society, both of which conduct environmental awareness campaigns in Kabul and have access to national government, although they are far from the Wakhan Valley, the focus of this hotspot investment.

The major international conservation NGO, and the only one with a long-term presence in Kabul and in the Wakhan Valley, is the Wildlife Conservation Society (WCS), which has been in the Wakhan since 2006. WCS helped establish the community based Wakhan Pamir Association and the Band-e-Amir Community Council, helped draft ten of the country's environmental laws and policies, and has been providing training to government and CSOs on conservation techniques, wildlife monitoring and surveys, and controlling illegal hunting. WCS is working with the government and local communities on research and conservation of snow leopards and mountain ungulates including Marco Polo sheep, markhor, ibex, and other species. WCS continues to support the management of Band-e-Amir and Wakhan National Parks.

In addition to Afghan and international groups, Tajik CSOs based in Khorog, the capital of Pamir, work with Afghan counterparts on environmental education and training.

7.2. China

Civil society and its legal framework have become more complex in China in recent years. However, the range of nonprofit and social organizations has expanded and CSOs are moving gradually from the margins of society into the mainstream. The Overseas NGO Law, which came into effect in January 2017, has raised the barriers for international NGOs seeking to work in China. Further, Chinese organizations raising funds from abroad may face additional requirements for reporting on their international contacts and may require approval to receive donations or visitors.

There are several forms of CSOs in China: social associations (*shehui tuanti*), which are the equivalent of membership associations; social service organizations (*shehui fuwu jigou*); and foundations (*jijinhui*). There are also various informal CSOs, small community-based organizations, and rural cooperatives.

Civil society engaged in conservation in Xinjiang are mainly nested within or associated with scientific institutions. The Xinjiang Institute of Ecology and Geography, within the Chinese Academy of Sciences, is the largest and the most important player in environment protection and natural resources management. The major science-based CSOs are:

- The Xinjiang Botanical Society was established in 1962 and today has 680 members including botanical experts and volunteers. The society conducts teaching and research, popularizes plant science and protection, provides advisory services, participates in decision-making, conducts international and local botanical expeditions, leads workshops, and disseminates knowledge.
- The Xinjiang Geographical Society was established in 1965 and today has over 700 members. It leads geographical expeditions, and promotes geographical knowledge, technology, and education. The society is active consulting and technical services and popularization of knowledge.
- The Xinjiang Wildlife Conservation Association was established in 1985 and is a member of the China Wildlife Conservation Association. It is engaged in wildlife conservation, research, education, and nature reserve planning. The association has 13,000 members from throughout the province and it works frequently with local forestry offices.
- The Xinjiang Zoological Society was established in 1963 and is active in animal science, training, and research.
- Xinjiang Ecology Institute was established in 1993 by the Xinjiang Environmental Protection Bureau and other partners to disseminate ecological knowledge, popularize ecological books, produce audio-visual materials and support the ecological education across the Xinjiang region. Xinjiang Tourism Institute established in 2014 is providing support in tourism development in Xinjiang.
- The Xinjiang Institute of Zoology, Xinjiang Soil and Fertilizer Society, Xinjiang Natural Resources Society, and Xinjiang Tourism Institute are all also important in biodiversity initiatives and international projects implemented in the province.

WWF, WCS, BirdLife, and Conservation International, among others, work in China, although not within the hotspot.

It is to be determined, but the Xinjiang Institute of Ecology and Geography might be required to serve as the official hub for CEPF grants at the local level.

7.3. Kazakhstan

The early 1990s saw the rapid entry of many groups into the CSO sector in Kazakhstan primarily for human rights and environmental issues, such as nuclear non-proliferation, clean-up of the Semipalatinsk nuclear test site, and the Aral Sea. The country has as many as 30,000 CSOs which fall under the formal supervision of the Ministry of Culture and Sport. Various restrictive provisions on CSOs were passed in 2014-2015, but were then lifted in response to popular pressure.

Of the 30,000 CSOs in the country, there are approximately 150 which conceivably could become engaged in CEPF-funded work in the Kazakh portion of the hotspot. Many of these are members of the Ecological Forum of NGOs of Kazakhstan. Environmental activitists have banded together, most notably in 2008, when under the banner of “Green Salvation,” there was a successful campaign to block high-voltage power lines from being routed through national parks.

There are many science-oriented CSOs that conduct ecological research, hunters' associations that do wildlife surveys, and groups that promote access to environmental information, particularly in regard to reduction of pollution. The largest conservation-focused group within the Kazakh portion of the hotspot is the Association of Biodiversity Conservation of Kazakhstan (ACBK), a BirdLife network partner. ACBK mapped Important Bird Areas, helped to establish several nature reserves, and has ongoing work on biodiversity monitoring, legislation reform, public awareness campaigns, and cross-border initiatives.

International funding for CSOs tends to focus on charismatic species, like the saiga antelope, snow leopard, and argali. Limitations for donors are minimal, but there are gaps and contradictions in the legislation regulating CSOs activities, which can cause delays.

7.4. Kyrgyzstan

Kyrgyzstan has probably the most diverse and active civil society community in the hotspot. Legislation on CSOs is very liberal and even local *jamoats* (small people's associations) can register in local government offices and gain legal status. The country has a relatively good banking system that allows for the easy movement of cash and culture of democratic spirit that encourages CSO engagement. Like elsewhere, there is sometimes a gap between enthusiasm and implementation ability, but the overall sector is strong.

There are about 200 conservation CSOs, including *jamoats*, which could conceivably become engaged in CEPF work. The largest is the Kyrgyz Association of Forest and Land Users, with 7,000 members and offices in every province in the country. The Alliance of Central Asian Mountain Communities (AGOCA) is another large network that unites 57 villages from Kyrgyzstan along with others from Tajikistan and Kazakhstan to promote rural capacity building, small enterprise, sustainable agriculture, and local governance.

Notable conservation CSOs include the *Aleine* Environmental Movement, which contributed to preparation of the Red List of Kyrgyzstan; the *BIOM* Youth Ecological Movement, which is active in environmental education, awareness, and research; the group known in English as "Independent Ecological Expertise," which is famous for environmental law and crime investigation; and the Kyrgyz Wildlife Society, active in bird conservation. The scientific and senior staff from many NGOs also hold positions within the Kyrgyz Academy of Sciences and its institutes, which can make formal proposals for new protected areas to the State Agency on Environmental Protection.

The strength and diversity of the CSO sector allows for ideas seen in other hotspots, like creation of CSO-managed micro-reserves and nurseries growing endemic species. However, groups struggle with acquiring appropriate skills, providing match funds to receive grants, proposal submission in foreign languages.

7.5. Tajikistan

CSOs in Tajikistan are engaged in a wide range of activities, including humanitarian work and environmental protection. They are normally registered as non-commercial organizations and operate under the Law on Public Associations (2007). They are split into public associations or public foundations, both of which register with the Ministry of Justice. In 2016, the Government passed new regulations on humanitarian aid that, among other things, required groups receiving funding from

abroad to formally notify the Ministry of Justice within ten days and to register on a Registry of Humanitarian Aid. This and similar restrictions have created a challenging operational environment for CSOs. The recent bank and cash crisis in the country has made financing more difficult for local groups, as well.

There are about 3,000 CSOs overall, but perhaps only 50 have an environmental focus or significant expertise in conservation. Of these, the Tajik Socio-Ecological Union is one of the oldest; it helped create Tajik National Park and Shirkent Natural Park. Others include the Youth Eco-Center, Nature Protection Team, Kukhiston, and Noosfera. Various groups in the Pamirs promote engagement with colleagues and communities in Afghanistan, and support for conservation-friendly enterprise and sustainable agriculture are common areas of work. Many CSOs are active in promoting the role of women in resource management. In recent years, field-based conservation work, particularly on ungulates and snow leopards, has been dominated by international CSOs and the Tajik Society of Hunters.

Funding for climate change dominates current donor priorities, which has forced CSOs to shift their focus and limit actions for conservation. The literal, physical work environment in Tajikistan can be difficult – high mountains, remote locations, border zones that require special permissions – making work for CSOs expensive and slow, a condition that is only exacerbated by the increasing dominance of Tajik, meaning that even scientific text or donor bidding documents in Russian need to be translated.

7.6. Turkmenistan

The Constitution of Turkmenistan states that citizens have the right to establish public associations and that the government should support civil society. The Law on Public Associations (2014) regulates civil society activities, including requiring registration of any project receiving foreign funding or technical assistance. The registration process can be long and complex, regardless of the size of the grant. Because of this law, people often do not bother creating formal public associations, and instead try to solve problems collectively through other means. The result is that there are relatively few CSOs, all that are well-established, with close relations with the government and a clear mandate for their work.

The Turkmen Society of Nature Protection is the oldest and largest nature conservation group in the country. Its activities cover and broad array of work: combating desertification; environmental education; the protection of wildlife; the protection of forests; conservation of natural and cultural heritage; the environment and health of children; alternative energy; and water, sanitation, and the protection of water resources. The second largest group is the Turkmen Society of Hunters and Fishermen, which focuses on wildlife conservation and management. There are others that comment on environmental legislation and on environmental impact assessments.

Foreign donors to local CSOs must consult with authorities in advance or funds can be blocked by banks receiving international transfers. Similarly, CSO access to nature reserves must be negotiated in advance. However, if the donor and CSO comply with all requirements, then implementation tends to go smoothly. A notable example is the Royal Society for the Protection of Birds, which has been successfully working in Koytendag Nature Reserve, building local staff capacity and helping in the nomination of the site as a UNESCO World Heritage site.

7.7. Uzbekistan

Civil society does not have an active presence in Uzbekistan, in general, or in the environmental arena, in particular. The government does not encourage foreign-funded projects, but instead supports Government-NGO partnerships via competitive bidding. Since 2016, CSOs seeking foreign funds must get advance approval from the Ministry of Justice, Ministry of Foreign Affairs, and the Banking Commission of Uzbekistan. The Ministry of Foreign Affairs must approve, in advance, any official meeting between a CSO and international parties, including for seminars or field visits. If all requirements are followed, implementation tends to go smoothly. However, an additional challenge is that all international funding is converted by the recipient bank at the official rate of exchange, typically half of the actual rate of exchange, meaning that the purchasing power of grants is also halved.

Those CSOs that do manage to operate actually have relatively high capacity. The Institute of Animals and Plants (under the Academy of Science), the Uzbek Society for the Protection of Birds, and the Uzbek Zoological Society are all prominent. There are other CSOs that focus on the Aral Sea, desertification, alternative energy, water and sanitation, environmental education, public awareness, and conservation of natural and cultural heritage that could conceivably become involved in CEPF-funded work. Lastly, there are large, government-controlled NGOs, like the Ecological Movement of Uzbekistan.

The GEF-SGP is well-established, and while technically, its funds are not “foreign,” it may offer synergies or avenues for reaching small groups. For larger grants in the country, the pool of applicants will likely be limited by those that already have formal permissions.

7.8. Regional Organizations and Networks

The University of Central Asia, based in Bishkek, hosts the Mountain Partnership Central Asia, which consists of 40 organizations from eight countries – the seven in the hotspot plus Pakistan. The Mountain Partnership promotes sustainable development, networking, and capacity building. It offers tools and platforms for use by regional stakeholders and provides technical support to countries and their governments for the mainstreaming of the mountain agenda into policy and planning processes. The University of Central Asia, a private entity with campuses in Kazakhstan, Kyrgyzstan, and Tajikistan, is the only university in the region that focuses on mountain areas and issues.

The Central Asia Regional Environmental Center (CAREC) was established in 2001 by the five Central Asian countries and international donors, including the EU. CAREC is headquartered in Almaty and has offices in each of the five capitals, as well as a project office in Kabul. CAREC formally addresses regional environmental issues of all types, as well as conducting pilot programs on payment for ecosystem services and awareness campaigns. CAREC has well-established links with government in each country and experience in grant-making.

ACTED (Agence d'aide à la Coopération Technique et au Développement, a French NGO) and the Aga Khan Development Network work on humanitarian issues and sustainable natural resources management in Afghanistan, Kyrgyzstan, and Tajikistan.

BirdLife International does not maintain a program office in the region, but instead works through its national country partners in all the countries other than Afghanistan and Tajikistan. Its United Kingdom partner, the RSPB, is working directly on several projects throughout the region.

Biodiversity International (the “rebranded” name of the combined CGIAR centers: the International Plant Genetic Resources Institute; and the International Network for the Improvement of Banana and Plantain) has a team in Tashkent that works on agricultural ecosystems, forests, and wild crop relatives throughout the region. Tashkent also hosts ICARDA.

The Aarhus Convention under the United Nations Economic Commission for Europe (UNECE) establishes rights of the public to access environmental information, to participate in environmental decision-making, and to challenge public decisions made without regard to these rights. In cooperation with UNECE and the Environment and Security Initiative, the Organization for Security and Co-operation in Europe (OSCE) supports a growing network of Aarhus Centres in Central Asia. These centers assist civil society organizations in building coalitions and working with governments at the local, national and cross-border levels. The centers are registerested as local CSOs, but they rely on international funding.

8. THREATS TO BIODIVERSITY IN THE HOTSPOT

This chapter presents an overview of the main threats to biodiversity and natural habitats in the hotspot and is closely linked to Chapter 5 (socioeconomic profile). Humans have influenced terrestrial biodiversity over much of the region for millennia, particularly in terms of farmland, grazing land, and predator control. However, as in the rest of the world, industrialization, political change, population grown, population movement, and economic development have escalated threats to an extreme level.

Current information on threats to biodiversity and their causes in the hotspot is scattered, and there are no overviews for the region. There are various sub-regional summaries for particular issues (e.g., climate change, desertification), and there are national overviews of threats in each of the NBSAPs and by international development agencies, but these vary considerably in quality and how current they are.

All documents were reviewed as part of the hotspot profiling process, and key threats and their root causes, as well as barriers to effective conservation within the hotspot boundary were identified through the various workshops held as part of the process. The workshops confirmed efforts from previous exercises per Table 8.1. In the table, upward arrows indicate increasing threats, downward arrows indicate increasing threats, and straight arrows indicate continuing threats.

Table 8.1. Threat Trends by Ecosystem

Ecosystem Type	Habitat Change	Pollution	Overuse	Climate Change	Invasive Species
Evergreen forests	↘	→	→	↗	
Wild fruit and nut forests	↘	→	↗	↗	↗
Desert forests	↘	→	→	↗	
Tugai and riparian forests	→	→	→	↗	
Deserts and semi-deserts	→	↗	→	↗	
Steppes	↘	→	→	↗	
High mountains	↗	↗	→	↗	↗
Rivers and lakes	→	↘	→	↗	→
Agroecosystems	↗	↘	↗	↗	↗

The trends for the fragile landscapes of the high mountains are negative (i.e., increasing threats) and climate change is a threat to every ecosystem. (Climate change is addressed separately in Chapter 9.) Positive trends (i.e., decreasing threats) are primarily in areas where the state or motivated local actors have seen it in their economic self-interest to act (e.g., reduced pollution of freshwater; avoided conversion of valuable forests).

8.1. Habitat Change

Changes in land use, the modification of natural river flows, and the withdrawal of water from rivers are the most common examples of habitat change. In this region, most lowland semi-deserts and foothills have long been converted to agricultural use, mainly for cultivation of cotton and cereals. Conversion of land for grazing is also historical in the lowlands and foothills in the winter and uplands in the summer.

This conversion has resulted in the loss of grasslands and semi-dessert grass-wormwood communities, with decreased loss in soil fertility. Poor water management and irrigation practices have led to salinization of soils, and the overuse of fertilizers and pesticides has caused downstream pollution (USAID 2013).

Threats from infrastructure, urbanization, and the changes resulting from economic development are all serious. Construction of roadways – either for human transport, movement of freight, or for connections to resource extraction sites – are all national priorities, particularly with China's One Belt – One Road initiative. Much of this work is slated directly within or around KBAs or important landscapes, promising for destruction of breeding grounds or disruption of migratory movement.

Hydropower dams, with their disruption of river flows, and irrigation schemes, with their excessive withdrawals of water, are both a historical legacy and a continuing threat that spreads well beyond the hotspot boundaries to the Aral and Caspian seas. Species in tugai (riparian) forests have been particularly affected. Of course, it is not only dams that represent a threat, but also the associated transmission lines and the broader development of power-generation infrastructure.

8.2. Overexploitation of Species and Ecosystems

8.2.1. Poaching, Excessive Hunting and Collection of Plants

Illegal hunting and poaching have reached an epidemic level in the region, despite strict legislation on species protection or listing of species in national Red Books. This applies particularly to high-value mountain ungulates ("trophy" species), falcons that are exported to the Middle East, and the Central Asian tortoise. This type of hunting is done for profit, with relatively large amounts of money to be made by people leading these illegal enterprises. In turn, this creates a disincentive for local people to protect these species, rather than joining in the behavior for short-term gains while they are still available.

During the Soviet era, with greater state control, poaching was less of an issue. Today, with decentralization of government and limited national revenues, enforcement is rare.

The most notable story is of the Saiga antelope, once widespread on the steppes and almost hunted to extinction. It is still critically endangered, but at least in Kazakhstan, government controls and popular support have led to a small recovery. Nonetheless, the small population is vulnerable to disease.

Similar to excessive hunting, the unregulated collection of plants is a threat for endemics for sale (e.g., various tulip species) and for household use (e.g., medicinal plants). In remote areas where plants are collected for medicinal use, people often do not realize that the species is threatened. Apart from awareness campaigns and promotion of alternative products, options exist for creation of cooperatives, nurseries, and cultivation of certain species.

8.2.2. Overgrazing

In Xinjiang, serious overgrazing and pasture degradation began as early as the 1970s (Zhang 2002). In the former Soviet republics, with the fall of the Soviet Union, domestic livestock production initially declined, but as economies stabilized, the herding of sheep and goats increased sharply, especially in the foothills and lower slopes (800-2,000 meters), although to a lesser extent in the high altitudes above

2,500 meters. Degradation from overgrazing is apparent around settlements, but its impact is much wider. Overgrazing leads to soil erosion and reduces fresh grass yields and species compositions, leading to growth of less palatable or inedible grasses, and consequent extensification by herders. The overgrazing of preferred grasses then leads to less fodder for native ungulates, such as the argali (mountain sheep).

8.2.3. Human-wildlife Conflict

Human-wildlife conflict is primarily a threat in Afganistan's Wakhan Valley, where there is retaliatory killing, trapping, and poisoning of snow leopards by herders trying to protect livestock. In the other countries, the fines and criminal penalties for killing a snow leopard seem to serve as sufficient deterent. However, for other predators, such as wolves, authorities encourage an even reward trapping and hunting.

8.3. Invasive and Alien Species

Invasive and alien species (IAS) are a serious threat to freshwater ecosystems and fragile mountain landscapes. In the past, commercial fish species were introduced to Lake Issyk Kul in Kazakhstan and the broader Talas River Basin with immediate impacts on endemics. More typical than purposeful introduction, however, has been the spread of invasives due to habitat change. IAS plants have moved into overgrazed areas, parasitic plants have grown off of excessive fertilizers in freshwater systems, and various birds, like the Common myna, have displaced natives.

8.4. Pollution

Pollution is of greatest threat in the most industrialized parts of the hotspot, or downstream from these. Xinjiang, with rapid economic growth, stands out for being at risk from industrial discharge, tailings, hazardous waste, and uncontrolled dumping, although it is not alone. The main freshwater basins of Lake Issyk-Kul, the Ferghana Valley, and the Ili Basin also are at risk from persistent organic pollutants and toxic waste.

8.5. Indirect Drivers of Threats

8.5.1. Demographic Pressures

Pressure from demography is inevitable. More people require more land, fuel, food, and water. Within the hotspot boundaries, about 42-44 million people live in the former Soviet republics and Afghanistan, and an additional 17-20 million people live in the Chinese part, with many more in the adjoining plains.

Overall population density is about 70 people/km^2, lower than in neighboring hotspots in the Himalayas or Caucasus, and varies with altitude and access to water. Densities are as low as 5-10/km^2 in the high mountain plateaus, which should be advantage for conservation, but the landscapes are so fragile that even this many people – and related development – can cause problems. For example, the Murgab district of Tajikistan has fewer than 15,000 people spread over 38,000 km^2, yet suffers from excessive collection of teresken bushes (*Ceratoides papposa* and *Artemesia* spp.) for fuel, overgrazing, and over-hunting. Similarly, the Afghan Wakhan only has 20,000 people (less than 4 people/km^2), but they suffer from extreme poverty that drives them to intensive use of natural resources. On the other hand, parts

of the Ferghana Valley and Tarim Oasis have 400 people/km^2 making predictable demands on the landscape.

8.5.2. Socio-Economic Factors

As addressed in Chapter 5, economic change has been a driver of land conversion. Much of the region was only accessibly by foot or on horseback until the mid-twentieth century. Since then, roads have opened wide areas to disturbance or exploitation. Even in areas without significant resources, there are scenic areas and ski resorts that draw increasing tourism and associated infrastructure.

Contrary to the former Soviet republics and Xinjiang, Afghanistan, in general, and the Wakhan Valley, in particular, have missed out on economic development. Civil conflict and insecurity have certainly set the country back. Because of its remoteness, Wakhan was luckily able to avoid some of the violence, but for the same reason, has received nominal support over the years. Poverty and low education create limited opportunities to promote sustainable long-term resource plans.

8.5.3. Weak Institutions, Regulations and Enforcement

Multiple institutional factors contribute to poor management of natural resources throughout the region. At a basic level, low salaries make it difficult for government agencies to attract the best personnel. There is also a generational disconnect, where science and conservation are seen as something done by the older, Soviet-trained generation. At a higher level, there are structural disconnects, if not competing priorities, between central and local authorities. Agencies responsible for agriculture, oil and gas, minerals, and water compete against one another and have more power than conservation agencies.

The result is that other than in the foremost national parks and reserves, protected areas lack staff that are appropriately paid, trained, or equipped to perform their jobs. Overall, there is little institutional capacity in many of the countries to properly manage a multi-unit system of protected areas, and biodiversity conservation is not well integrated into development planning or private sector activities.

At the regional level, cooperation remains challenging. Some of the countries do not trust their neighbors or put their own economic interests ahead of the regional good. There is also a long-standing conviction from many of the region's leaders that economic development and conservation cannot happen at the same time.

8.6. Summary of Threats by Country

- **Afghanistan's** NBSAP identifies threats nationwide rather than for the Wakhan Valley alone. These threats include land conversion for agriculture and housing, illegal hunting, deforestation, overgrazing, shrub collection, dryland farming, water diversion, and climate change (Fifth National Report 2014). The underlying issues are population growth, a low level of development, and widespread poverty. Within the Wakhan Valley, the threats are overgrazing and the poaching of wild sheep for meat.

- Threats in **Xinjiang, China** are from extractive industries, infrastructure development, and increasing consumption that comes with the rapid creation of a middle class. Uncontrolled domestic tourism is threatening particular sites and species.

- **Kazakhstan's** report on the NBSAP cites overgrazing, illegal hunting, over collection of wild plants, increasing tourism, and agricultural expansion as the primary threats (Fifth National Report 2014).

- Primary threats in **Kyrgyzstan** are over-exploitation of forests containing fir, juniper, and trees bearing wild fruits and nuts; over-exploitation and degradation of Lake Issyk-Kul; freshwater pollution; and degradation of steppes, foothills, and grassland corridors that are important for endemic species (Fifth National Report 2013).

- **Tajikistan** suffers from a declining knowledge base in science and academia that cannot provide basic information on biodiversity or its status; low capacity of state actors responsible for conservation; rapid population growth combined with poor economic prospects of communities in forest and pasture areas; agricultural expansion right to the borders of protected areas; and lack of clear title to land (Fifth National Report 2014).

- The portion of **Turkmenistan** in the hotspot is limited to the Koytendag Ridge, a spur of the Pamir-Alay Mountains. Primary threats in this area are expansion of agriculture, overexploitation of certain species, and recreational tourism.

- The portion of **Uzbekistan** that lies in the hotspot includes the highly populated areas of greater Tashken and the Ferghana, Kashkadarya, and Zeravshan Valleys. These areas rely on freshwater lakes and wetlands that are important for birds. Loss of habitat, agricultural expansion, agriculture-related pollution, unregulated tourism, and infrastructure development are also major threats (Fifth National Report 2015).

9. CLIMATE CHANGE ASSESSMENT

The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report states that each of the last three decades were successively warmer than any previous decade since 1850, and that multiple independent datasets show warming in the range of 0.6°C to 1.0°C over the period of 1880-2012. This global impact is being felt in the hotpsot, where temperature increases range from 0.2°C to 0.4°C per decade over the last 40 years. The spring and fall seasons have exhibited the largest warming trends. Winter temperatures increased in the southern lowlands and mountains of Central Asia, but the cold spells of 2008 and 2012 have reduced the significance of this trend. In the Tarim basin of China, precipitation increased by 20 percent between 1960 and 2000 (Rumbaur 2015). Higher surface temperatures have resulted in increased evaporation and reduced soil moisture content, especially during the dry summer months, thereby amplifying the risk of droughts in lowlands and reducing the amount of surface run-off in mountains.

National and regional climate projections expect increases in temperatures and precipitation across the hotspot and as much as a fifty percent loss in glacial cover by mid-century. Small and low altitude glaciers are expected to vanish completely. The glaciers of Bogda Peak, outside of Urumqi, shrank by 20 percent between 1962 to 2006, and "Glacier Number One," Urumqi's primary source of water, has shrunk by 17 percent between 1962 to 2014 (Wang, *et. al.,* 2014). In response, the Chinese government has banned tourism to Glacier Number One and restricted vehicle use, grazing, and mining nearby.

The high-altitude glaciers of the Pamir and Tien Shan sit at the top of the Vakhsh and Panj river basins that form the Amu Darya River. These glaciers could reduce by half in a scenario with 2° of warming. The Fedchenko and Zeravshan glaciers have not yet shown significant loss of ice volume, yet, but nonetheless, Tajikistan has launched a state program on glacier monitoring and protection.

According to the Global Climate Risk Index, in 2014, Afghanistan was the second most climate change-affected country in the world, with most impacts occurring in Badakhshan Province, home to the Wakhan Valley. Experts predict glacier loss, warming, and unstable ecosystems.

9.1. Impact on Human Populations and the Economy

The number of days with temperature above 40°C has been increasing in the densely populated southern areas of Central Asia. This has a negative impact on agriculture and rural and urban populations affected by heatwaves.

The climate effects on water regimes are highly variable. As glaciers retreat and snow cover patterns change, the hydrological changes in small and medium rivers in the high mountains are becoming noticeable. The flow in rivers fed by glaciers and snowmelt are expected to increase, especially in summer, for example in the Sary-Dzjaz and Aksu in the Tien Shan Mountains (Kundzewicz et al, 2015; Krysanova et al, 2015).

More extreme weather events are expected (IPCC, 2012), as are flash floods, which are very destructive given the heavy sediment and rock content of the rivers. Another type of flooding is when rain falls on snow or frozen ground in flat areas, leading to standing water and damage to infrastructure. Project warming will likely affect the stability of mountain permafrost and glacial moraines, which may lead to an increased risk of glacial lake outburst floods.

More frequent and longer droughts are expected, with expected conflicts over competing economic uses for limited water and a demand for more reservoirs and water-related infrastructure. Agricultural phases may also change, with earlier blooming and changing times of harvest.

Climate variability is expected to allow for new insect pests to colonize the region, and for existing pests to increase in population. Countries are rightfully afraid of examples like the 2007 locust outbreak that destroyed 35,000 hectares of crops and the 2008 cotton budworm outbreak in Tajikistan that halved the harvest.

Human health will be directly affected by extreme heat in the summer, including for agricultural workers, the elderly, the very young, and pregnant women. As average temperatures increase, diseases are likely to spread more easily, thus adding threats to both animal and human health. Heat stress contributes to cardiovascular disease, and warming patterns can increase the risk of malaria outbreaks. Heavy rainfall in areas with inadequate water supplies and substandard sanitation can increase the risk of infections such as typhoid, salmonellosis, cholera, and dysentery.

The increase in extreme weather events is likely to cause short-term population displacement and migration, and the degradation of the ecosystems that sustain livelihoods is expected to accelerate both seasonal and long-term migration.

9.2. Impact on Biodiversity

Various studies expect mountain forests and pastures to move up in elevation and to decrease in size, but it is not known if higher elevation soils will support these ecosystems. Productivity of mountain forests is expected to decline for slow-growing juniper forests (*Juniperus turkestanica*). Climate change is also bringing new species to the region. Table 9.1 summarizes information from the studies and the profiling team's stakeholder consultations.

The hotspot is important for both rare and endangered species as well as for agro-biodiversity (Vavilov, 1926), from which cultivated plants have originated. The hotspot harbors wild relatives (landraces) of important agricultural crops and domesticated fruit and nut trees that possess resistance and tolerance to pests, diseases, and climatic stress; thus, are of incredibly high value.

Research in Tajikistan predicts an increase in temperature of 3°C in 2050. Given that air temperatures cool by 0.6°C per 100 meters, climatic conditions at any given site today will be 500 meters higher in elevation in the future. Forest sites today can potentially grow at these new elevations, but only if soil conditions and precipitation/moisture allow. Conservation planners will need to devise *in situ* and *ex situ* measures to allow for adaptation.

The number and intensity of wildfires is expected to increase, placing remnant forests at risk. At the same time, relict and paleoendemic species have fire-resistant traits that make them more valuable for conservation.

With shrinking habitat, there will be greater conflict between humans (and domesticated animal species) and wildlife, further decreasing wildlife populations.

Table 9.1. Climate Change Effects on Biodiversity

Possible effects	Likely indicators and consequences
Earlier bird arrival, earlier appearance of insects	New wintering areas for some birds: avocet (*Recurvirostra avosetta*), ruff (*Philomaxis pugnax*), wood sandpiper (*Tringa glareola*), redshank (*Tringa totanus*) and earlier spring arrival. New wintering places for the Common crane, little bustard, waterfowl genus, Ruddy shelduck and other species in the Central Asian region (Kreuzberg-Mukhia 2002).
Shift in habitat extent for some plant species and animal ranges	Elevation changes in the spread of the mountain forests and changes in bird and mammal habitats (*Juniperus turkestanica, Malus sieversii*, *Juglans regia*, *Cursorius cursor*, *Phalacrocorax pygmaeus*)
Increase in pressure levels for threatened species, endemic species, and unique ecosystems	Climate change combined with fragmentation and overuse of the mountain ecosystems has already driven gazelle (*Gazella subguttarosa*) and bustard (*Otis tarda*) off the Western Tien Shan Mountains. Other species, including tortoise and jerboa (*Allactaga jaculus, A. severtzovii*, *A.vinogradovi*) have diminished in numbers and extent of occurrence.
Changes in water quality and quantity and impacts on freshwater species and ecosystems	Deterioration of water quality. Impacts of water deficit on delta ecosystems. Increase in irrigation demand due to higher evaporation and, consequently, higher stress on available water resources.

9.3. Mitigation and Adaptation Opportunities

Resilience and the capacity to adapt will determine the response to climate change in the region. Strong, stable economies and effective governance improve adaptive capacity. Healthy ecosystems ensure higher resiliency.

9.3.1. Regional Responses

Several organizations at the regional level have the potential to contribute to Central Asia's collective capacity to respond to climate change. As the only regional organization with all five Central Asia states as members, the International Fund for Saving the Aral Sea (IFAS) serves as a political structure for discussion and management of regional environmental issues. The organization has launched regional climate assessments and has sponsored the Fedchenko glacier research, but its efforts to secure international donor support for climate funding have not been as successful as hoped.

Since 2016, the Climate Adaptation and Mitigation Program for the Aral Sea basin (CAMP4ASB), designed with support of the World Bank, hosted by the IFAS, and implemented by CAREC, has been the main (but not only) regional climate cooperation and policy coordination platform. As this Profile was being written, CAMP4ASB was in the inception and planning phase of regional and country-specific responses.

Other regional responses are being hosted by IFAS for hydrology, UNESCO for glaciers, the Regional Mountain Centre of Central Asia (part of the ICSD) for mountain ecosystems, and the Bishkek-based

Central Asia Institute of Applied Geosciences (CAIAG) for monitoring. There are also plans to create the Central Asian Centre for Disaster Risk Reduction, the Regional Drought Management Centre, and the Regional Centre on Climate Technologies, all of which will address climate change.

The Aarhus Centres, discussed in Chapter 7, should allow civil society to gain access to information on climate change.

In May 2016, the Kazakh government hosted a ministerial conference with the five former republics and China discussing how to increase forest cover, reduce forest loss, and cooperation for firefighting and the stopping of illegal logging.

If fully funded and successful, each of the above measures will have a direct or indirect positive effect on biodiversity conservation. Efforts on glacier conservation, watershed protection, better forest management, and monitoring all will protect the natural areas in which key biodiversity areas and corridors are found, and those civil society organizations that become more involved in climate change (due to the Aarhus Centres) may also become more involved in biodiversity management.

9.3.2. National Responses

All the hotspot countries have submitted their intended nationally determined contributions (INDCs) to the UN Framework Convention on Climate Change, with Afghanistan, China, Kazakhstan, Tajikistan, and Turkmenistan ratifying the 2015 Paris Agreement at the time of writing.

China is the largest emitter of greenhouse gases in the hotspot, but at a national level, it is planning major domestic actions to improve energy efficiency, install renewable energy sources, curb carbon emissions, and expand afforestation programs. This includes work in Xinjiang, which has one of the largest wind generation sites in the world and where wind is responsible for a quarter of the energy generated in the province.

Kazakhstan's GHG emissions reached their highest level in 1990 at 357 million tonnes of CO_2-equivalent, and in 2014 were 20 per cent below that level. GHG emissions in the energy sector account for more than 85 per cent of total emissions. The government has adopted a green economy strategy and has launched carbon emissions trading through permits and caps. There are incentives for renewable energy and energy efficiency projects and the country is hosting the international Astana EXPO-2017 on "Future Energy." Several wind and solar energy parks are under development, mainly in the windy steppes and deserts of the country, and small hydropower is expanding in the mountains.

Kyrgyzstan's climate-related activities include a national strategy for sustainable development for 2013-2017 and a national program and laws for improving energy efficiency and developing renewable energy. The country has identified priority directions for adaptation to climate change with sectoral action plans, and has established a high-level inter-sectoral and inter-institutional climate dialogue platform.

Tajikistan has adopted a national climate change mitigation action plan and climate adaptation strategy. Other climate-related national initiatives include strategies on glaciers, energy efficiency, small-scale hydropower, disaster risk reduction, and forests.

In Turkmenistan, the National Climate Change Strategy of 2013 lays out the policy framework for building climate resilience and a low-emission economy. The country has invested significant efforts to reduce GHG emissions by adopting several mitigation policies. In terms of adaptation, Turkmenistan has initiated policies that aim to improve its agricultural and land management practices and advance socioeconomic reforms.

Uzbekistan is leading on Clean Development Mechanism projects, and investments are planned for solar energy development and improving energy efficiency in the residential sector and industries. Its INDC focuses on the reduction of carbon intensity of GDP and a number of adaptation measures.

Afghanistan has developed national adaptation measures and is implementing climate projects, but none yet in the Wakhan Valley. In 2009, Afghanistan completed its first National Adaptation Programs of Action for Climate Change and National Capacity Needs Self-Assessment for Global Environmental Management. In 2013, the Government ratified the Kyoto Protocol (valid until 2020) and submitted its Initial National Communication under the UNFCCC. In April 2016, Afghanistan signed the Paris Agreement, submitting its "Intended Nationally Determined Contribution" paper, which gives an overview of what Afghanistan aims to do for mitigating climate change as well as highlighting its adaptation needs. The Government is currently preparing its Second National Communication for submission to the UNFCCC and finalizing its national Climate Change Strategy and Action Plan and National Adaptation Plan.

Since the passing of the Environmental Law (2007) and Environmental Strategy (2008) for the Afghanistan National Development Strategy (ANDS), Afghanistan has issued a number of policy responses and climate change initiatives. In collaboration with the United Nations Development Programme, the Government is developing a draft National Climate Change Strategy and Action Plan. Upon completion, this strategic document will serve as the framework for the ANDS climate change commitments both on the national and local levels.

In the context of ANDS, the environment is "a cross-cutting issue that underpins the entire social and economic development framework for the country." As mandated by the strategy, the National Environmental Protection Agency (NEPA) serves as the overall coordinating organization for environmental management in Afghanistan. NEPA works with other line ministries and agencies to advocate for and ensure the requisite policies and measures are in place to enable environmental and climate conscious development outcomes.

As with the regional responses to climate change, each of the national responses, if successful, should positively affect biodiversity. The measures above will, variously, reduce pressure on threatened species by reducing fragmentation inoverused and fragile mountain ecosystems; better protect KBAs that are refuges as climate changes; and conserve riverine flow vital for freshwater species.

9.3.3. Responses at the Household Level

A relatively well-educated Central Asian population is one positive legacy of the Soviet era, and the population of Xinjiang also is well-educated. This allows households to generate income and to better prepare for climate change. Income from diverse sources adds to economic resilience by protecting households from the loss of income from a single source (World Bank SDU SDN 2011).

The people of Tajikistan, Kyrgyzstan, and the Wakhan Valley are most at risk. It is important to raise awareness and provide incentives for climate change response. CSOs are important for making this happen.

Building household resilience to climate change should have an indirect effect on biodiversity conservation. In theory, more resilient households will have lesser impetus to engage in destructive practices (e.g., cutting of firewood) or illegal activites (e.g., poaching of threatened species, whether for meat or for sale).

9.4. Review of Major Climate Change Initiatives

Financial assistance for climate change projects across different sectors in Central Asia is becoming a more prominent part of the work of development banks, the United Nations, and the bilateral donors.

China and Kazakhstan are promoting low-carbon development paths. Tajikistan has received funding via the Pilot (Strategic) Program for Climate Resilience (PPCR) and Kyrgystan is in the process of PPCR programming. The largest regional climate initiative is the World Bank's CAMP4ASB.

As members of the UNFCCC, each of the Central Asian countries has nominated institutions to meet its convention obligations. China, Kazakhstan, Kyrgyzstan and Tajikistan have each created climate change centers or departments, all of which work with domestic partners to meet the UNFCCC requirements. Some countries have developed national strategies and actions plans, and have launched projects on mitigation and adaptation, such as Kyrgyzstan's Climate Change Coordination Commission.

The Green Climate Fund (GCF) is expected to provide new strategic and large-scale opportunities for hotspot countries to address climate change concerns while strengthening their economies, reducing poverty and improving environmental performance. The first GCF investement within the hotspot was allocated to Tajikistan through the EBRD in 2017 to strengthen climate resiliency of the energy sector with a focus on the Kairakum dam and hydropower station on the Syr Darya River. Another GCF project is likely to cover natural disaster-prone southern provinces of Kyrgystan.

10.ASSESSMENT OF CURRENT CONSERVATION INVESTMENTS

Funding for biodiversity conservation in the hotspot comes from governments, donors, multilateral funds, foundations, and the private sector. This chapter summarizes funding sources and most relevant projects to help determine the niche for CEPF investment.

Across multiple countries, it can be difficult to fully assess the source or amount of all funds. For example, a large NGO like WWF might implement a single program with multiple bilateral or private donors. Similarly, ongoing programs like Environmental Remediation Account for Central Asia might start with funds from one donor (i.e., the EBRD), but then transition to another. Nonetheless, consultations with stakeholders suggest, across all sources of domestic, international, and private funding, that between US $20 million – $30 million per year is allocated to biodiversity conservation and related topics (e.g., watershed management, forestry, research, monitoring). Table 10.1 shows an assessment of the relative level of funding by country and donor with a scale, from greatest to least, of predominant, medium, minor, marginal, and negligible.

Table 10.1. Indicative Proportions of Investments to Biodiversity Conservation in the Hotspot

Country	Domestic Public Sector	International Donors	Private Sector
Afghanistan (Wakhan)	Marginal	Predominant	Negligible
China (Xinjiang)	Predominant	Marginal	Marginal
Kazakhstan	Predominant	Marginal	Minor
Kyrgyzstan	Minor	Minor	Marginal
Tajikistan	Minor	Moderate	Marginal
Turkmenistan	Predominant	Marginal	Negligible
Uzbekistan	Predominant	Minor	Marginal

Afghanistan is noted for its dependence on foreign donors for conservation, but even in Tajikistan and Kyrgyzstan, with higher amounts of foreign funds, major gaps still exist. Funding for conservation in Uzbekistan can be difficult to assess in terms of the hotspot boundary, because large amounts go for the Aral Sea region (i.e., outside the hotspot) or for economic development in the Ferghana Valley (i.e., inside the hotspot, but not necessarily for conservation). International funding for China, Kazakhstan, and Turkmenistan ebbs and flows – sometimes, their GDP is high enough that they do not request, or are not eligible for, donor assistance; or, their economies are massive in relation to the amount of foreign funding. Nonetheless, all are eager to accept technical assistance and introductions new technologies or best practice.

Not properly accounted for here is Chinese investment into the other six countries. The Asian Infrastructure Investment Bank and the Belt Road initiative will both invest money into infrastructure and energy, perhaps with some of this being used for impact assessments, biodiversity surveys, or land or funding offsets.

A different way to assess country dependency on sources other than public revenue is the OECD's statistics on country programmable aid (CPA), as shown in Table 10.2.

Table 10.2. Country Programmable Aid Dynamics, Aid Dependency, and Outlook

Country	2008 (USD million)	2014 (USD million)	Aid per capita, 2014 (USD)	CPA per GNI, 2014	2019 (projected USD million)
Afghanistan	40	30	126	20.2%	25
China	2149	886	1	0.01%	1300
Kazakhstan	336	109	6	0.06%	100
Kyrgyzstan	377	572	100	8.4%	600
Tajikistan	300	350	42	4.5%	370
Turkmenistan	3850	4000	6	0.08%	4000
Uzbekistan	189	360	12	0.5%	570

Source: OECD

10.1. Government Funding

It is difficult to fully assess the amount of public revenue or domestic funding for conservation. Not all the countries make such information easily available, and countries like Kazakhstan, which have more transparent online systems, do not necessarily provide all the relevant details or sub-categories of spending. Kazakhstan and Kyrgyzstan are both members of the German and Swiss-supported Biodiversity Finance Initiative (BIOFIN), which supports review of biodiversity expenditures and helps determine the cost of implementing NBSAPs. Kazkahstan joined BIOFIN in 2014 and Kyrgyzstan joined in 2016, so they are still generating data. Table 10.3 shows preliminary results for Kazakhstan in terms of the whole country, not the hotspot portion alone.

Table 10.3. Indicative Proportion of Conservation Financing in Kazakhstan (BIOFIN estimates)

Funding sources	Proportion	Comments
National budget	73%	Reforestation, pest and wildfire control, new forest belts, flora and fauna, nature reserves, landscapes
Local governments budget	13%	Nature reforestation, nature reserves
International organizations, donors	7%	Various projects
Hunting concessions	4%	Rental fees, trophy fees, etc
Private sector	3%	Programs in the Caspian Sea region, mining, etc.

Table 10.4. Indicative Levels of Public Funding for Biodiversity Conservation

Country	Protected areas I-II (nature reserves and national parks)	Protected areas III-V (*zakazniks* and nature management areas)	Forest protection and reforestation	Landscapes and non-flagship species
Afghanistan	Marginal	No funding	Marginal	No funding
China	Sufficient	Limited	Sufficient	Limited
Kazakhstan	Sufficient	Marginal	Sufficient	Limited
Kyrgyzstan	Limited	No funding	Limited	Marginal
Tajikistan	Limited	No funding	Limited	Marginal
Turkmenistan	Sufficient	Marginal	Sufficient	Limited
Uzbekistan	Sufficient	Marginal	Sufficient	Limited

Protected areas and forested areas are major recipients of public finance, with the bulk of this funding for staff salaries and basic operating costs, such as patrolling (Table 10.4). The BIOFIN analysis indicates the gaps and scenarios for change (e.g., how much funding could be raised by increasing trophy fees or collection from fines). Across the hotspot, governments provide only nominal amounts for civil society to become engaged in conservation activities.

10.2. Multilateral and Bilateral Donors

The major single source of international aid for conservation in the region is the GEF working via its implementing agencies, the UNDP, UNEP, FAO, and the World Bank. This includes both funding for outright conservation as well as for conservation-related elements of climate change projects (e.g., ecosystem resiliency, sustainable financing, landscapes).

Whereas the vast majority of GEF funding goes to national government entities, the GEF Small Grants Programme (SGP) is targeted at civil society. SGP makes grants of up to $50,000 and is active in each of the countries other than Turkmenistan. Challenges facing CSOs seeking access to SGP money are varying requirements for matching funds and application procedures that can be difficult for nascent groups. However, in places like Kyrgyzstan, the SGP provides good outreach via a network of local supervisors. Another challenge is that during implementation, financial reporting must follow national standards for organizations receiving public funds – such standards can be daunting for smaller groups.

The SGP in Kazakhstan will have a particular overlap with CEPF in the next two to three years. There, SGP expects to support work in and around protected areas, hunting concessions, and IBAs. In Kyrgyzstan, the SGP intends to direct funding at *jamaats* (community-based organizations) in the southwestern parts of the country, where CEPF plans to work, too. Across the hotspot overall, there are possibilities for CEPF and the GEF SGP to collaborate on grant-making or find procedural synergies (e.g., in Uzbekistan).

Table 10.5 summarizes GEF-6 STAR Allocations, including SGPs and multiple major projects, while Tables 10.6 and 10.7 provide overviews of funding via multilateral and bilateral agencies, respectively. Examples of specific projects relevant to the planned CEPF investment are given in Table 10.8.

Table 10.5. GEF-6 STAR Allocations for Hotspot Countries (USD millions)

Country	Climate Change	Biodiversity	Land Degradation	Total	Fully Flexible
Afghanistan	3.00	3.91	4.39	11.30	no
China	126.00	58.55	9.95	194.50	no
Kazakhstan	11.81	5.04	5.13	21.99	no
Kyrgyzstan	2.00	1.56	3.04	6.60	yes
Tajikistan	2.00	1.50	2.78	6.28	yes
Turkmenistan	4.99	1.81	3.29	10.09	no
Uzbekistan	11.46	1.78	5.12	18.37	no

Over the period of 2010-2015, the majority of bilateral funds for conservation in the five former republics came from Germany, Switzerland, Japan, and the European Union, while the United States, via its Agency for International Development (USAID), has been the major provider in the Wakhan Valley. Meanwhile, as part of One Belt-One Road, China established the Central Asian Centre for Ecology and

Environment – hosted in Urumqi by the Xinjiang Institute of Ecology and Geography – with satellite offices and monitoring stations in Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan. China is also actively attracting students from the region for higher university study.

Table 10.6. Overview of Investments by Multilateral Agencies

Donor	Countries	Areas of support
FAO (with GEF)	Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan	Agricultural reforms, forestry and land sector, climate resiliency, CACILM-2
World Bank (with GEF and CIFs)	Kyrgyzstan, Tajikistan, China, Uzbekistan, Afghanistan	Sustainable agriculture and landscapes, CAMP4ASB, water management, agricultural reforms, hydrometeorological monitoring network modernization
ADB (with GEF and CIFs)	Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan	Combating land degradation, water reforms, disaster risk reduction, pilot program for climate resilience (PPCR in Tajikistan)
EBRD (with GEF and CIFs)	Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan	Energy efficiency and renewable energy, waste management improvements, infrastructure, and rural development (PPCR in Kyrgystan)
GEF and its Small Grants Program	All countries of the hotspot	Medium-sized biodiversity-related projects in the hotspot (see table 10.8); small grants to local CSOs: sustainable use of natural resources, support to protected areas, access to clean energy, ecological education and awareness, ecotourism

Table 10.7. Overview of Conservation-Related Investments by Bilateral Agencies

Donor	Countries	Areas of support
China	Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan	Research and training, environmental monitoring, infrastructure (Belt and Road)
European Union / European Commission	All countries of the hotspot	Regional environmental cooperation, water management, disaster risk reduction, forest and pasture improvements, river basin management (Zeravshan Basin in Tajikistan), clean-up of the hazardous waste and toxic legacies, education
Switzerland (SDC)	Kyrgyzstan, Uzbekistan, Tajikistan	Water reforms, mountain development, disaster risk reduction, health and sanitation, waste management, education
Germany (BMZ, BMUB via GIZ + KfW)	Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan	Sustainable pasture, land, forest and wildlife management, education, health, energy, basic infrastructure
United States (USAID)	Afghanistan, Kyrgyzstan, Kazakhstan, Tajikistan	Wildlife conservation (via WCS and WWF), agriculture, food security, water and sanitation, education, capacity building
Russia	Kyrgyzstan, Tajikistan	Uranium waste rehabilitation, education, capacity building
Japan (JICA)	China, Kyrgyzstan, Tajikistan, Afghanistan	Sustainable natural resource use, disaster risk reduction

Table 10.8. Selected Projects Relevant to CEPF Investments

Project Name	Country	Donors and partners	Duration	Project aims and scope	Budget (USD)
Sustainable natural resource use and forest management in key mountain areas	Uzbekistan	GEF-UNDP	2016-2020	To enhance conservation, and sustainable use of natural resources in the mountain ecosystems of Uzbekistan (Chatkal-Pskem).	6M GEF (25M co-financing)
Conservation and sustainable use of Pamir and Tien Shan ecosystems for snow leopard protection	Tajikistan	GEF-UNDP NBBC	2016-2020	Conservation and sustainable use of Pamir Alai and Tien Shan ecosystems for snow leopard protection and sustainable livelihoods.	5M GEF (20M co-financing)
Conservation of globally important biodiversity, land and forests of the Western Tien Shan	Kyrgyzstan	GEF-UNDP	2017-2021	To promote a landscape approach for protection of internationally important biodiversity, land and forest resources in the Western Tien Shan.	4M GEF (24M co-financing)
Integrated forest ecosystem management	Kyrgystan	GEF-WB	2016-2021	To promote reforms of the national and *jeskhoz*-level forest governance, introduce innovative natural resource management planning, and improve information about the state of forests (updated inventory)	4M GEF (12M co-financing)
Zeravshan River basin natural resources management project	Tajikistan	EU ACTED, AKDN	2016-2020	Sustainable water, forest and pasture management and rural development	10-50M
Biosafety in Central Asia	Afghanistan, Kyrgyzstan, Tajikistan, Uzbekistan	EU ISTC	2017-2020	Training on bio-safety and bio-security and strengthening the national legal framework	5M
Enhanced competitiveness of Tajik agribusiness	Tajikistan	EU	2014-2019	Enhancing Tajik agri-food value-chains, products quality and competitiveness	5M
Strengthening the management effectiveness of the protected areas in Altai mountains and wetlands, Xinjiang	China	GEF-UNDP	2014-2018	Strengthening the provincial legal and institutional capacity for enhanced protection of wetland ecosystems and more effective protected areas planning and management and developing community co-management approach in Liangheyuan reserve (Altai region is outside of the hotspot boundaries)	3.5M GEF (20M co-financing)

Project Name	Country	Donors and partners	Duration	Project aims and scope	Budget (USD)
Xinjiang Turfan water conservation project	China	WB	2010-2017	Rehabilitation of modern and traditional canals delivering water, drip irrigation, land leveling, improved drainage, evapotranspiration-based integrated water management	100M
Integrated nature resource management in agricultural production landscapes of Central Asia (CACILM-2)	Regional	GEF-FAO	2017-2021	To enhance multi-country collaboration, adoption of climate-smart agriculture practices, pilot interventions, WOCAT and knowledge exchange. Pilot areas include piedmont parts of Hissar	10M GEF (65M co-financing)
Community-based management of walnut forests and pastures in Southern Kyrgyzstan	Kyrgyzstan	Germany (BMZ) – GIZ	2014-2018	To introduce modern and rational models of sustainable forest and pasture management and promote conservation of biodiversity, and climate adaptation.	5M
Regional programme for sustainable and climate sensitive land use for economic development in Central Asia	Regional	Germany (BMZ) – GIZ	2016-2019	Land users, government agencies and the private sector in Central Asia adopt integrated, economically and ecologically sustainable forms of land use, taking climate change into account.	10M
Biodiversity protection in the transboundary Northern Tien-Shan	Kazakhstan	Germany (BMZ) NABU and AVALON	2013-2016	The development of integrated management system for protected territories in the transboundary region of Northern Tien Shan in Kazakhstan and Kyrgyzstan. Geographic scope: Almaty reserve, Ile-Alatau park, Kolsai Koldery park (KZ) and Chon-Kemin park (KYR).	1M
Ecological production by women handicraft cooperatives	Kyrgyzstan, Tajikistan	EU UMBRIA	2014-2015	Creation of ecological production by women handicraft cooperatives and marketing in Asia and Europe	0.5M
Uniting and strengthening community based tourism (CBT) associations	Kyrgyzstan, Tajikistan	EU ACTED	2014-2015	Reinforcing the roles and competencies of CBTs in Tajikistan and Kyrgyzstan and establishing agro-tourism	0.5M

Project Name	Country	Donors and partners	Duration	Project aims and scope	Budget (USD)
Biodiversity financing management (BIOFIN)	Kazakhstan	UNDP Switzerland Germany	2013-2017	To build policy and develop new biodiversity and ecosystems financing mechanisms in order to address financing gap.	0.5M
Biodiversity conservation through sustainable use of wildlife	Kyrgyzstan	Germany (BMZ) – GIZ	2010-2017	Improvement of knowledge and monitoring for better management of mountain ungulates and cooperation under the CITES and CMS.	1M
Conservation and sustainable use of agricultural biodiversity to improve regulating and supporting ecosystem services	Uzbekistan	GEF-UNEP	2015-2018	To mainstream the conservation and use of fruit tree biodiversity to enhance ecosystem services and improve the traditional agricultural systems.	1M GEF (4M co-financing)
Ensuring socio-ecological resilience and wild crop relatives conservation	Tajikistan	Christensen Fund	2015	Continuing support for the Small Grants Program linking traditional knowledge, landscapes and livelihoods around restoration of endangered varieties of fruits and wild crop relatives.	0.25M
Improving capacity for protected area management in Tajikistan	Tajikistan	FFI	2014-2016	To improve conservation impact by increasing the capacity of current and future conservation professionals.	0.5M
Mainstreaming ecosystem service into country's sectoral and macroeconomic policies	Kazakhstan	UNEP	2013-2015	To develop national capacity to integrate ecosystem services considerations into the macroeconomic policies and programs.	0.5M
Monitoring key sites for white-headed duck in Kazakhstan	Kazakhstan	Ornithological Society of the Middle East, the Caucasus, Central Asia	2013-2015	To gather new data on the conservation status of White-headed Duck in Kazakhstan and update the National Single Species Action Plan.	0.1M
Forest and biodiversity governance including environmental monitoring (FLERMONECA)	Regional	EU, GIZ, Hessen-Forst, UBA, CAREC	2013-2015	To promote cooperation and build capacity in forest and pasture management and the shared environmental information systems and environmental monitoring	5M

Project Name	Country	Donors and partners	Duration	Project aims and scope	Budget (USD)
Sustaining agricultural biodiversity in the face of climate change	Tajikistan	GEF-UNDP, NBBC	2009-2015	Conservation and sustainable use of globally significant and local agricultural biodiversity, as well as the development of the market for sustainable agricultural practices in the face of climate change.	1M
Integrated river basin management in the Tigrovaja Balka reserve	Tajikistan	MFA Norway, WWF Russia	2007-2012	Restoration of the threatened floodplain habitats and water management in the Tigrovaya Balka nature reserve	0.3M
Mainstreaming biodiversity into oil-and-gas sector policies and operations	Uzbekistan	GEF-UNDP	2010-2015	To enable a policy, legislative and institutional environment to mainstream biodiversity into the oil-and-gas sector, and to demonstrate the use of biodiversity mainstreaming technologies in oil-and-gas operations in the Ustyurt.	1M
Demonstration of sustainable pasture management	Kyrgyzstan	GEF-UNDP	2013-2015	Development plans and programs for environmentally sustainable solutions in the Susamyr Valley	1M
Sustainable management of natural resources in Gorno-Badakhshan (Pamir Mountains)	Tajikistan	Germany (BMZ) – GIZ	2008-2013	Improve living conditions through the sustainable management of natural resources and dissemination of energy technologies.	2M
Sustainable management of endemic fish fauna of the Issyk-Kul Lake	Kyrgyzstan	GEF-UNDP	2010-2015	To strengthen the policy and regulatory framework and support endemic fish conservation.	4M
Improving the coverage and management effectiveness of PAs in the Central Tien Shan	Kyrgyzstan	GEF-UNDP	2013-2017	To improve the coverage and effectiveness of protected areas in the Central Tien Shan Mountains to better cover threatened species habitats (snow leopard).	5M
Building the capacity of the Zorkul Reserve	Tajikistan	FFI	2012-2015	Staff training and developing the basic skills to manage the reserve and monitor species (Bar-Headed Goose).	0.2M

Project Name	Country	Donors and partners	Duration	Project aims and scope	Budget (USD)
Developing a national biodiversity conservation training program	Tajikistan	Darwin Initiative, FFI	2009-2012	To improve conservation impact in Tajikistan by increasing the capacity of current and future conservation professionals through conservation skills program and promoting conservation research.	0.2M
Sustainable management and biodiversity conservation in the Lake Aibi Basin	China	GEF-WB	2011-2016	Water management	3M GEF (9M co-financing)
Xinjiang meadows and livestock management and desertification	China	JICA	2007-2012	Improved livestock management, reduction of grazing pressures and combating desertification	3M
Conservation and sustainable utilization of wild crop relatives	China	GEF-UNDP	2007-2013	Involvement of farmers in conservation of wild relatives (focus on wheat in Xinjiang)	8M GEF (13M co-financing)
Strengthening sustainability of the national protected area system in Uzbekistan	Uzbekistan	GEF-UNDP	2008-2012	The project objective is to demonstrate new management approaches for expansion of protected area system of Uzbekistan.	2M
Strengthening the protected areas system in Turkmenistan	Turkmenistan	GEF-UNDP	2008-2014	Enabling environment for a functional, effective and ecologically coherent system of protected areas.	3M
Community-based conservation and management of mountain ungulates	Tajikistan	Germany (BMZ) – GIZ	2008-2012	The direct involvement of local people into protection and use of the species for conservation efforts.	1M
In-Situ on-farm conservation and use of agricultural biodiversity	Uzbekistan, Turkmenistan	GEF Biodiversity International	2007-2014	To provide farmers, institutes and communities knowledge, methods and policies to conserve globally significant wild crops and fruit species.	5M
Tracking the sociable lapwing: conservation beyond the breeding grounds	Kazakhstan	Darwin Initiative, BirdLife	2009-2011	To extend and develop local capacity to better understand and improve the conservation of the Sociable Lapwing.	0.2M

Project Name	Country	Donors and partners	Duration	Project aims and scope	Budget (USD)
In-Situ conservation of Kazakhstan's mountain agro-biodiversity	Kazakhstan	GEF-UNDP	2005-2012	To conserve and sustainably use agro-biodiversity (wild apple forests) by developing and applying new methods and tools for conservation, building partnerships among conservation agencies, local governments, communities and the private sector.	3M GEF (20M co-financing)
Central Asian Countries Initiative for Land Management (CACILM)	Regional	ADB	2006-2012	Restoration and enhancement of the productive functions of land in Central Asia.	30M GEF (125M co-financing)
Biodiversity conservation and sustainable development in the Gissar Mountains	Tajikistan	GEF-UNDP	2005-2011	To conserve the global biodiversity of the Gissar Mountains by strengthening protected areas and increasing the sustainability of the livelihoods of the rural population around them.	1M
Dashtidzhum biodiversity conservation project	Tajikistan	GEF-WB	2003-2007	To demonstrate and replicate in-situ conservation of globally significant biodiversity in Dashtidzhum	1M
ECONET - web for life	Regional	GEF-UNEP WWF Russia	2003-2006	Creation of ECONET and integration into the regional and national plans of sustainable development	2M
Establishment of the Nuratau-Kyzylkum biosphere reserve as a model for biodiversity conservation	Uzbekistan	GEF-UNDP	1998-2006	To enhance conservation of the area's globally important biodiversity and the long term sustainable development through the establishment of an integrated conservation and local development program	1M
Central Asia biodiversity project on conservation of the West Tien Shan Western Tien Shan-2	Kazakhstan, Kyrgyzstan, Uzbekistan	GEF-WB GEF-WB	2001-2006, 2012 -*on hold*	Conservation of the biodiversity of the Western Tien Shan, including coordination of national policies and institutional arrangements. Alternative income-generating activities for local communities to reduce pressure on nature reserves. Improved regional cooperation.	13M

The European Union is the leading donor in Central Asia with overall assistance for 2014-2020 budgeted at €1 billion. Noteworthy projects include:

- Mass media for improved reporting on the environment and natural resources in Central Asia, implemented by Internews, €1.5 million.
- Zeravshan Valley natural resources management (EU Delegation in Tajikistan), implemented by ACTED, AKDN and other organisations, €10-50 million.
- Support to Kazakhstan's transition to a Green Economy (EU Delegation in Kazakhstan), implemented by UNDP, €7 million.
- Support to the introduction of sustainable development policies in natural resources management and energy-environment sectors of Turkmenistan, implemented by Human Dynamics (ended in 2016), €2 million.
- Coordination and support for the EU-CA regional cooperation on environment, water and climate change (WECOOP II), implemented by MWH, €2 million.
- Raising awareness for sustainable water and environment development in rural areas of Uzbekistan, implemented by CAREC, €2 million.
- Environmental Remediation Account (ERA) for Central Asia to clean up the uranium mining legacies in Tajikistan and Kyrgyzstan implemented by EBRD, €18 million.

Looking back, the EU has a legacy of efforts, for example the EU-China Biodiversity Programme (2005-2011) invested $80 million into 18 projects throughout the country, including three in Xinjiang. Looking ahead, the EU is now working on a strategic approach for conservation in all of Asia, with a volume dedicated to Central Asia being prepared by WCS. The regional approach, called "Larger than Tigers," is intended to guide the programming of EU funding related to biodiversity. The authors of this profile and the Central Asia "Larger than Tigers" team have coordinated in the development of these strategies.

The World Bank has implemented work throughout the region, including the Western Tien Shan biodiversity conservation project in Kazakhstan, Kyrgyzstan, and Uzbekistan; the Dashtijum biodiversity conservation project in Tajikistan; and major pollution clean-up efforts in Kyrgyzstan and Kazakhstan. Major ongoing projects include the Environmental Land Management and Rural Livelihoods project in Tajikistan (5M), the Integrated Forest Ecosystem Management in Kyrgyzstan (total 16M, with 4M GEF financing), the East-West International Transit Corridor Project between Almaty and Korgos, China, and several agricultural, road and water projects in Uzbekistan. The Bank supports regional efforts like the Central Asia Climate Adaptation and Mitigation Project for the Aral Sea Basin (CAMP4ASB) and capacity building programs in Tajikistan and Uzbekistan designed to promote information exchange and coordinated ecosystem adaptation efforts. The Bank also supports national hydrometeorological service modernization projects and regional disaster risk management efforts. Finally, the Bank also supports the Extractive Industries Transparency Initiative in Kyrgyzstan, Kazakhstan, Tajikistan, and Afghanistan, which could lead to improved collaboration with national mining associations and individual companies.

Germany is the largest single country contributor to conservation in the five former republics. Much of its funding is implemented by GIZ, or sometimes by German NGOs like NABU. Funding focuses on pastures and forest use, wildlife management (including hunting), water resource management, economic development, capacity building for state institutions, and education. There are plans to bring major investments into the forest sector via the Green Climate Fund, German climate initiatives, and banks. The Kazakh-German University supports students from all Central Asia and Afghanistan to study

natural resource management, and Germany supports PhD candidates at the Central Asia Geosciences Institute in Bishkek.

Japan supports work throughout the region, but its biodiversity focus is in Kygyzstan. It has supported a program called "One Village, One Product" around Lake Issyk-Kul to develop unique agricultural products or handicrafts in a sustainable manner. Japan also supports university students and professional from Afghanistan and the five republics to study abroad. In Afghanistan, JICA is supporting improved hydrological and land use management in the Panj-Amu River basin.

Switzerland is a long-time donor in the Kyrgyzstan, Tajikistan, and Uzbekistan. The KYRFOR project mapped forests in Kyrgzstan and supported mountain-focused CSOs, leading to the creation of networks like CAPM and AGOCA. Today, Swiss money flows via SECO/EBRD, SDC, and through international Swiss CSOs such as the Red Cross and Helvetas. The Swiss Federal Office for the Environment (FOEN) has funded preparation of climate change, biodiversity, and waste and chemical syntheses, contributed to capacity building and preparation of the Intended Nationally Determined Contribution (INDC) of Tajikistan through UNITAR, and modernization of the State of the Environment report of Turkmenistan via CAREC. Several pilot projects on Payments for Ecosystem Services (PES) were sponsored by Switzerland and implemented by CAREC in the mountains of Kyrgyzstan, Tajikistan and Kazakhstan. As the GEF Council, Switzerland leads the constituency for Central Asia and Azerbaijan.

USAID biodiversity funding was more significant in the past. Currently, Afghanistan is receiving the most significant conservation funding, with WCS being the primary implementer. US Government policy supports a "New Silk Road" and "C5+1" agenda to increase connectivity between the five former republics and Afghanistan and to foster greater stability. There are numerous projects on agriculture and food security, governance, trade, education, health, water and sanitation, while in Kyrgyzstan USAID supports WWF efforts on the snow leopard. USAID also supports initiatives on improved water management and glacier research.

Russia is a traditional biodiversity science and conservation cooperation partner for Central Asia countries. Many students from Central Asia and some students from Afghanistan study in Russian universities, and Russia invests in schools and universities within the region. The Russian Bat Research Group, the Botany Institute (BIN), and others promote expert networks, knowledge exchange, field research, and applied conservation. Russia also contributes significant funds via UNDP, UNECE, and other UN agencies for environmental activities and cooperation in the region.

The Turkish Cooperation and Development Agency (TIKA) offers assistance in Central Asia and Afghanistan in social and economic development with a focus on infrastructure and the enhancement of production sectors, including forestry. Turkey supports many university students and professionals for study and training in Turkish colleges.

Korea is active in forest and plant research via the Korea National Arboretum (KNA). In Uzbekistan, KNA supported extensive work on and publication of the flora of the Western Tien Shan, and has ongoing collaborations in Kyrgyzstan and Tajikistan.

The **UK Darwin Initiative** funds UK organizations to work with partners on biodiversity. The Darwin Initiative has supported several projects implemented by BirdLife and FFI in Turkmenistan, Kazakhstan, Uzbekistan, and Tajikistan.

Norway and Finland provide targeted support to climate and water projects in Kyrgyzstan and Tajikistan, where CSOs are actively participating. In the past Norway has funded several tugai ecosystem conservation projects in the region.

AFD (L'Agence Française de Développement / French Development Cooperation Agency) has worked in the hotspot countries, but not typically on biodiversity or within the hotspot, itself.

There are, of course, other major donors to the region, but the contributions are not directly for biodiversity conservation, or the donors do not include environmental concerns as significant input to program design. For example, money for the Gulf States is primarily for religious and cultural issues (e.g., construction of mosques, support of pilgrimage) or for infrastructure (e.g., landmark buildings, roads).

10.2.1. Global Snow Leopard and Ecosystem Protection Program (GSLEPP)

The GSLEPP is a significant regional initiative. Its partner and funding entities include the GEF, World Bank, UNDP, and several other donors, and implementers, who via the program, have joined under the banner of the governments of all the snow leopard range countries (i.e., twelve countries overall, including all the hotspot countries other than Turkmenistan). Together, they support a common agenda – the Biskek Agenda of 2013 – that has identified desired portfolios in each country (i.e., identified programs that require funding). Fully implementing the GSLEPP portfolios will require tens of millions of dollars. Nonetheless, the CEPF program purposefully considers GSLEPP and, in various areas, complements its approach or helps to achieve its objectives.

10.2.2. Collaborative Efforts under the Convention on Migratory Species

Under UNEP, the Convention on Migratory Species (CMS) provides a global platform for the conservation and sustainable use of migratory animals and their habitats (UNEP CMS, 2017). Under CMS are:

- The Central Asian Mammals Initiative (CAMI), which includes action plans to address threats to specific species, as well as the removal of barriers to migration, the maintenance and restoration of transboundary ecological networks (e.g. Resolution 10.3) and the preservation of animal migrations in the Central Asian region as one of the last global "migration hotspots" (CAMI, 2017).

- Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia (Raptors MoU), which lists 93 raptors as part of an action plan to reverse population decline, protect species from unlawful killing and taking, improve scientific knowledge, enhance cooperation, econource research, increase public awareness, and address human threats (Raptors MoU, 2017).

Under these initiatives are single species action plans, such as for the Argali that highlight responses to threats, including minimizing impacts or disturbance from linear infrastructure (*International Single Species Action Plan for the Conservation of the Argali,* Action 2.4). The CEPF program purposefully considers these initiatives and attempts to complement them, particularly as they highlight the role of NGOs.

10.3. International Funds and Private Foundations

The International Fund for Saving the Aral Sea (IFAS), currently based in Ashgabat, receives funding support from the five Central Asian members and international donors, and then grants money for afforestation and reforestation in the Aral Sea basin. This includes a small amount of support in vulnerable mountain areas. IFAS reviews its strategy every 5-7 years.

The Aga Khan Foundation is perhaps the highest profile foundation in the region. While it does not have a focus on conservation, it supports sustainable mountain development (particularly in Afghanistan, Kyrgyzstan, and Tajikistan), reforestation, and disaster risk reduction. Aga Khan was the primary funder of the University of Central Asia and its campuses in Kazakhstan (Tekeli), Kyrgzstan (Bishkek and Naryn), and Tajikistan (Khorog).

The Economic Cooperation Organization's Science Foundation (ECO SF) promotes scientific and technical collaboration between the 10 ECO member countries (including Afghanistan and the five former republics) by providing travel grants and sponsoring conferences and exchange programs across its member countries. It focuses on alternative and renewable energy and land management with strong links to the Tehran Secretariat for Low Forest Cover Countries and the Institute for Environment, Science and Technology.

The Fund for Biodiversity Conservation of Kazakhstan (locally known as FSBK) was established in 2007 via a UNDP-GEF project and is now an independent legal entity. The fund is designed to raise money from private companies (e.g., (Kazakhmys, Air Astana) and channels it into grants for conservation, but awards and dispersals have been limited in recent years.

The Open Society Foundation (Soros Foundation) has been active in Central Asia for many years. Its contribution for conservation is nominal, but instead builds the capacity of CSOs that focus on health, education, mass media, human rights, and accountability. Many CSOs that have received support from the Soros Foundation could viably implement grants related to CEPF priorities.

The Rufford Foundation has about 25 small projects supporting individual conservationists and groups working on Snow Leopard, Menzbir Marmot, Pallas's Cat, nurseries for endemic species, conservation of walnut forests, and IBA management in Kazakhstan, Kyrgyzstan, and Tajikistan.

The Mohamed bin Zayed (MBZ) Species Conservation Fund provides grants for focused work on the conservation needs of threatened and important species. Its major initiative covering the region is for crane conservation and hunter education through the Western and Central Asian Site Network for Siberian Cranes and Other Waterbirds (WCASN) established under the Convention of Migratory Species.

The Christensen Fund has been active in Afghanistan, Kyrgyzstan, and Tajikistan supporting organic farming, conservation of agro-biodiversity, projects that link traditional knowledge with landscape restoration, and cross-border cooperation on better management of crop wild relatives. It supports popular efforts like the "Blooming Apricot Festival" in Kyrgyzstan, and with The **Leonardo DiCaprio Foundation,** provides support to community-based groups on snow leopard protection.

The Michael Succow Foundation, with support from the German Government, has been active most recently in Kazakhstan, Turkmenistan, and Uzbekistan to improve protected area networks. It co-organized a regional conference on ecosystem-based adaptation to climate change in 2015.

The World Wide Fund for Nature (WWF) is present in the five Central Asian countries and China. It uses the majority of its funding to support its own efforts on species conservation (Persian leopard, the Bukhara deer, gazelle, snow leopard) and their habitats, plus its landscape-level conservation concept, ECONET. It does channel microgrants to communities and CBOs.

The Snow Leopard Trust (SLT) has staff and projects in the five Central Asian countries. It works closely with the GSLEPP Secretariat and with local affiliates like the Kyrgyz Snow Leopard Foundation. It conducts and supports research, community-based conservation programs, and education activities in and around the Sarychat-Ertash Nature Reserve and the Shamshy wildlife sanctuary (*zakaznik*). It also provides staff and expertise directly to the GSLEPP Secretariat in Bishkek.

The Panthera Foundation is devoted exclusively to the conservation of the world's wild cats. In Xinjiang, it works with the Beijing Forestry Institute on snow leopard surveys and threat analysis. In Kyrgystan and Tajikistan, it works with the Academy of Sciences and government authorities on issues of human-wildlife conflict, anti-poaching, illegal wildlife trade, habitat protection, and protection of snow leopard prey species like the ibex.

10.4. Assessment of Funding Opportunities and Gaps

In terms of funding for civil society in the conservation space, CSOs receive money to work on traditional and broadly accepted activities like environmental education, training, and awareness, with money used for posters, leaflets, lectures, information campaigns, websites, and popular outreach methods. There has also been funding to CSOs for rural development and forest, pasture, and water management. There has been less money to support CSOs in more complex field-based conservation of KBAs.

In terms of funding for species and site conservation, most money has gone into planning – the plans are quite robust – but less has gone into implementation. Thus, there are well-developed plans from GSLEPP, the Argali action plan, and the Central Asian Mammal Initiative (CAMI). In theory, donors can select from the menu of options that these plans present. Within the countries, if not the hotspot, are ongoing implementation efforts targeted at saiga antelope, kulan (Transcaspian wild ass), and sturgeon, all of which can provide models and lessons for work within the hotspot. Overall, there has been relatively little funding to support CSOs engage in more complex, field-based conservation of KBAs.

There are a few examples of "innovative" financing mechanisms in the region. Payment for ecosystem services (PES) is understood and has been piloted in China, Kazakhstan, Kyrgyzstan, and Tajikistan. With the exception of China, these pilots have been limited in terms of scope and scale. There are also examples like the "Archa Initiative" that promote public-private partnerships, in this case around botanical gardens and *ex situ* conservation. Newer still to the region is promotion of certification and eco-labeling of sustainable forest and agricultural products, to incentivize biodiversity-friendly land management practices and/or create revenue streams for conservation. A final example that may be promising is from micro-finance and the establishment of revolving funds to support small enterprise and household needs. These are common worldwide, but are now being proposed specifically for conservation enterprises tied to particular KBAs or landscapes in the hotspot.

11.CEPF NICHE FOR INVESTMENT

The preceding sections of this document have described the species, sites, and corridors of greatest need, the constraints or limits of governance and the demands of economic development, the primary threats, the capacity of CEPF's core constituency – civil society organizations – and an analysis of current funding. Understanding these in concert allows for the definition of where CEPF fits – where it should give money, to whom or to what types of groups, for what types of work, to what end – in other words, the niche for CEPF investment.

CEPF is a biodiversity conservation fund. Since 2008, it has adhered to a methodology of identifying, prioritizing, and working to conserve KBAs: sites that contribute significantly to the global persistence of biodiversity. In 2016, a group of leading international conservation NGOs formed the KBA Partnership and agreed to follow an updated methodology, the IUCN Global Standard for the Identification of Key Biodiversity Areas. This ecosystem profile represents the first ever wide-scale application of this new standard. During the profiling exercise, many stakeholders (i.e., CSOs, scientists, government partners, etc.) learned about the global KBA Standard for the first time and endorsed its use in the seven hotspot countries.

The KBA methodology identifies areas that can be managed – for conservation – as a unit. The methodology does not prescribe that KBAs should be formally protected, nor does it state that an area has less significance if it is used for some economically productive activity. The methodology leaves those choices to the stakeholders, and certainly allows for decisions that allow for both conservation and sustainable use. The methodology also does not detract from a model well known in the region, where the focus is on a flagship species, a unique species, or a pristine location. Prioritization of KBAs can be done to ensure habitat conservation of multiple species, not just one, and prioritization of KBAs can be done to create a matrix of connectivity across a landscape. In this context, the KBA methodology supports national economic goals and the specifics outlined in NBSAPs**. The niche for CEPF investment is based on this KBA methodology and will reinforce its use in the Mountains of Central Asia.**

The niche of working in KBAs is refined by **prioritization of KBAs for those that are in trans-border areas, those that allow for resilience to climate change, and those that allow for linkages across productive landscapes.** CEPF will match its grantmaking to the capacity and authority of its civil society partners, which might not work at the transboundary or landscape scale. However, we can prioritize paired KBAs that face each other across borders, KBAs that are along altitudinal gradients, or KBAs within forest or grassland corridors. Such an approach complements existing species-focused strategies and the regional initiatives of other major international NGOs and donors.

The niche in this hotspot is also defined by the management and operational environment for making grants in each country. There are political realities and issues of peace and stability that will require purposeful collaboration with others. In order to operate, it is important that CEPF is aligned with already approved strategies or major programs soon to be presented to national authorities, including the GEF SGP, GSLEPP, the EU Cooperation Platform on Water and the Environment in Central Asia, and the EU's *Larger than Tigers* strategy for wildlife conservation in Asia.

Further, **the niche allows for purposeful synergy with possible future funders and is responsive to new threats.** Economic development driven by Chinese investment could place overwhelming pressures on natural resources and ecosystems. On the other hand, funding from China for conservation could easily dwarf all other donors combined and be a considerable force for good. A good investment strategy is

one that guides, or at least informs, the investments of other donors. Thus, in addition to China, the niche considers the interests of other possible players, including Switzerland, GIZ, and various foundations.

One niche in which CEPF will fit is ensuring that **biodiversity conservation fully supports local and national economic development agendas.** This includes grants that support conservation enterprise, that encourage the sustainable management of productive landscapes, and that guide infrastructure and private sector activity to minimize impact. CEPF's niche is to promote a common agenda between decision-makers/politicians, private developers, and civil society.

Another niche is for CEPF to **complement public sector managers of protected areas.** Funding from the state is low, meaning many reserves exist only "on paper." CEPF will not pay for public sector responsibilities, but will support the engagement of civil society that has an equal stake in better management of these sites.

Finally, a niche for CEPF is to **build the capacity of CSOs to engage in conservation in the hotspot.** CSO engagement in the environment sector is not as robust as in most other hotspots. However, the political situation is not uniform across the seven countries, and in some, the situation is quite dynamic. There are several places where there is scope for CSOs to become involved as: implementers; monitors; educators; and raisers of awareness. CEPF grants will find the balance to build capacity within the political space appropriate for each country.

CEPF defines its niche by the positive actions that can be taken via grant funding. Similarly, CEPF defines its niche in terms of actions that it cannot take. In other words, as described in the preceding chapters, some threats go beyond the scope of a program like CEPF, which makes relatively small grants to civil society, and there are some places where civil society does not have the freedom to engage with an international donor on biodiversity conservation. Thus, the investment strategy only responds to the subset of opportunities and threats appropriate for CEPF. For example, no grants are anticipated to address threats from energy-related infrastructure, because stakeholders advised against this issue being taken up by CEPF-funded CSOs. Similarly, while priority sites might include geographically contiguous KBAs separated by international borders, CEPF will not promote grants in geographies that will create or exacerbate political tensions.

11.1. Theory of Change for CEPF Investment in the Mountains of Central Asia Hotspot

The theory of change for CEPF investment does not vary dramatically from one hotspot to the next, so some of the text here is similar to that of other Ecosystem Profiles, although there are nuances to the Mountains of Central Asia.

The fate of biodiversity and the overall environment, along with the multitude of services it provides in support of economic and social elements of livelihoods, is determined by three broad groups of stakeholders: state actors; private sector actors; and civil society. These groups include resource managers, decision makers, and interest groups, and include organizations that are likely to become CEPF grantees. The relative influence and importance of these groups varies among sites and countries across the hotspot but they are assumed to be present in some form at every site where CEPF makes grants. The overall Theory of Change for the program is based around influencing the behavior of these

groups, to encourage and enable them to use their influence for the benefit of biodiversity and ecosystem sustainability. The specific changes that are hoped for in each of these groups, and the role of CEPF grantees in achieving these changes, are described below.

The state plays multiple roles, from local to international levels, but two roles are of particular importance in the context of the objectives of the CEPF program: the state as a direct manager (or owner) of ecosystems (e.g., forests, high mountains); and the state as a planner and regulator of the management of natural resources. The most direct role of the state in biodiversity conservation is as a manager of protected areas. Earlier chapters showed that many KBAs are not in protected areas and that even where protected areas have been created, there are significant problems with funding and management effectiveness in many countries. Improving the management effectiveness of existing protected areas is essential, however, and the niche argues for creation of coalitions of protected areas staff, local government, and interest groups with a common agenda.

In addition to managing protected areas, state agencies are typically responsible for management of significant areas of land as forests, water protection zones, and grazing and agricultural tracts. CEPF engagement should aim to work with these agencies to accommodate the needs of threatened biodiversity and ecosystems into their management practices. The role of CSOs may be direct, identifying high priority locations and appropriate changes to management and then working with government staff on the ground, or indirect, influencing the funding, regulations and policies that determine the way that these agencies manage the land under their control.

The second crucial role of the state is as legislator and regulator of natural resource use, using legal and economic tools. Here, the objective of CEPF engagement should be to support governments to be more strategic and effective in this role. The state's role in enacting and enforcing legislation on land-use planning, environmental impact assessment, protected species and sites could be supported and strengthened with civil society's input on the basis of field work and site-based demonstration projects.

This is a difficult area for civil society intervention, as some of the governments in the region have traditionally been rather closed to input from civil society. However, this is changing, and one of the roles of the CEPF Regional Implementation Team is to help promote wider understanding of the positive role that CSOs can play in support of government policy formulation. Nevertheless, many local CSOs lack the capacity and experience to undertake the kind of long-term, intensive work required to influence national policies and programs.

In this context, CEPF will take a two-pronged approach to helping CSOs engage more deeply with state actors. At site level, the RIT will work with grantees (directly, or through facilitating mentoring arrangements involving more experienced NGOs) to assist them to package their work and results in a form that will attract the attention of local governments. This might entail demonstrating how work at sites enhances the economic value of ecosystem services, addresses food security issues, or increases tourism revenues. At the same time, CEPF will use its regional role to identify opportunities and facilitate the engagement of local CSOs with national, regional, and international processes, including conventions and agreements, through which CSOs can increase their visibility and promote their experience and knowledge, including to their own country delegations.

The private sector is a diverse group with significant impacts on resource management. Where private sector actors directly manage land and resources, then the potential role for CSOs, as with government agencies, is to identify priority sites and engage with the companies to improve the way they manage

biodiversity as part of their business operations. For other companies, action may involve reducing their environmental footprint (for example, through reduced water use or improved waste management), where these actions are a direct threat to a priority site, or it may involve the company providing financial or in-kind support to conservation efforts. Establishing long-term relationships of support between companies and particular sites or species has the potential to be an important way to address the problem of sustainable funding for conservation efforts. Relevant voluntary industry schemes promoting, for instance, sustainable tourism may provide an entry point for discussion with companies. Companies that buy and sell products from traditionally managed, high biodiversity landscapes also are potential development partners for grantees addressing the conservation of priority KBAs.

Civil society encompasses a diverse range of stakeholders but the most relevant for the CEPF program are those who directly manage or exploit threatened biodiversity or the ecosystems on which it depends. The generic objective of CEPF engagement with these stakeholders is to minimize harmful behavior, and optimize contributions to biodiversity conservation from their activities. Examples might include: assisting hunters to secure rights over resources that allow them to regulate offtake; assisting farmers to put in place more sustainable land management systems and benefit from improved access to markets; and working with tourism guides to minimize disturbance to rare species and enhance visitor experience. Strategies to do this will generally involve a combination of individual interest (e.g., improved income, long-term security of access) and mobilizing public and social opinion, exercised through formal and informal rules and norms (e.g., local regulations to maintain ecosystems which have a value as a public good). It can also involve working with other stakeholders who have an interest in sites and species, such as university departments, water-user groups, and recreational user groups. CEPF grantees often originate from these civil society groups, and typically have strong networks and experience working with them. In addition to financial support, the role of the RIT will be to assist CSOs become more strategic and effective in their work with civil society, and then to build on the results as a basis for influencing the state and private sector actors described above.

12.CEPF INVESTMENT STRATEGY

Based upon an analysis of conservation outcomes (Chapter 4), an assessment of the capacity of civil society actors (Chapter 7), an overview of direct and indirect threats to biodiversity (Chapter 8), a consideration of projections for climate change (Chapter 8) and a review of trends in conservation investment (Chapter 10), this chapter recommends specific investment priorities grouped into broad strategic directions. These are areas where CEPF can add most value or complement existing investments in biodiversity conservation, justified in terms of the current context for conservation, past experience with conservation initiatives, and opportunities to complement and build upon current conservation investment.

To maximize the contribution of CEPF grant-making to global biodiversity conservation within the Mountains of Central Asia Hotspot, it was also necessary to refine the full lists of species, site and corridors outcomes (Appendices 1, 4 and 5) into a focused set of priority outcomes for investment (priority species, sites and corridors) over a five-year period. The purpose of selecting priority sites and corridors was to enable investment by CEPF in site-based and landscape-scale conservation actions to focus on geographic areas of the highest priority and feasibility, while the purpose of selecting priority species was to enable investments in species-focused conservation actions to be directed at those globally threatened species for which conservation needs cannot adequately be addressed by general habitat protection (site-scale or landscape-scale) actions alone.

For all priority outcomes for CEPF investment, the most important selection criteria were urgency for conservation action, feasibility within the scope of CEPF funding, and opportunity for additional investment. Priority species, sites and corridors were selected only where current threats, if not mitigated, were predicted to cause their extinction (in the case of species) or the loss of key elements of biodiversity (in the case of sites and corridors) within the next 10-20 years. In addition, priority species, sites and corridors were selected where there were considered to be great opportunities for CEPF and other organizations to invest in conservation actions by civil society that complement or improve targeting of investments by governments and other donors. Further, the set of priorities is flexible. CEPF conducts annual reviews of its portfolios and formal mid-term assessments in consultation with stakeholders: strategies and priorities can be adapted to new threats, new opportunities, or the capacity of the implementing CSOs.

When translating the conservation strategy outlined in this chapter into a portfolio of grants, it will be of paramount importance to take into account the specificities of the hotspot and the individual countries within it, as outlined in the other chapters of the profile. While there are common issues that lend themselves to a common approach (with attendant opportunities for collaboration and experience exchange), the context for conservation varies considerably among countries, especially between the Central Asian republics, China and Afghanistan, particularly with regard to the way civil society is organized and active. This calls for common but differentiated approaches across the hotspot.

12.1. Priority Species

National consultations and the processing of the stakeholder questionnaires provided the basis for prioritization of the species outcomes. The list of priorities includes both high profile species, such as snow leopard, for which CEPF may only provide complementary funding, and less well-known species, such as Strauch’s toad agama, for which CEPF may be the only source of investment. While CEPF focuses

on globally threatened species, the national consultations identified some taxa in need of conservation attention that are not currently assessed as globally threatened (Appendix 3). Some are close to meeting the criteria for globally threatened, some are particularly distinctive sub-specific taxa, and some are geographically distinct populations. If any of these taxa are recognized as globally threatened on the IUCN Red List, they will be automatically added to the list of species outcomes, and will be candidates for inclusion on the list of priority species, when it is next updated (for instance, at the mid-term assessment of the CEPF investment program). This includes gray wolf, Eurasian lynx, and brown bear, all of which are not globally threatened but may have local sub-species that are threatened.

A total of 33 species outcomes were selected as priorities for CEPF investment (Table 12.1). A little more than half are plants, while the others are animals, mainly mammals and birds. The priority species are found in all seven hotspot countries, with at least nine species in each country. This creates opportunities for civil society organizations across the hotspot to engage in species-focused conservation actions.

Table 12.1. Priority species for CEPF investment

No.	Scientific Name	Common Name	Global Threat Status			Distribution by Country						
			Critically Endangered	Endangered	Vulnerable	Afghanistan	China	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Mammals												
1	*Cervus hanglu*	Bukhara Deer		EN		+	+	+		+	+	+
2	*Marmota menzbieri*	Menzbier's Marmot			VU			+	+	+		+
3	*Ochotona iliensis*	Ili Pika		EN			+					
4	*Ovis orientalis**	Urial			VU	+		+		+	+	+
5	*Panthera uncia*	Snow Leopard		EN		+	+	+	+	+		+
Birds												
6	*Anser erythropus*	Lesser White-fronted Goose			VU			+			+	+
7	*Aquila heliaca*	Eastern Imperial Eagle			VU	+	+	+	+	+	+	+
8	*Aquila nipalensis*	Steppe Eagle		EN		+	+	+	+	+	+	+
9	*Columba eversmanni*	Yellow-eyed Dove			VU	+	+	+	+	+	+	+
10	*Neophron percnopterus*	Egyptian Vulture		EN		+	+	+	+	+	+	+
11	*Vanellus gregarius*	Sociable Lapwing	CR			+		+	+	+	+	+
Reptiles												
12	*Phrynocephalus strauchi*	Strauch's Toad Agama			VU					+		+
Amphibians												
14	*Ranodon sibiricus*	Semirechensk (Xingjian) Salamander		EN			+	+				
Fishes												
14	*Aspiolucius esocinus*	Pike Asp			VU			+	+	+	+	+
15	*Pseudoscaphirhynchus kaufmanni*	Amudarya Shovelnose Sturgeon	CR			+				+	+	+

No.	Scientific Name	Common Name	Global Threat Status			Distribution by Country						
			Critically Endangered	Endangered	Vulnerable	Afghanistan	China	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Plants												
16	*Amygdalus bucharica*	Wild Almond			VU				+	+		+
17	*Armeniaca vulgaris*	Wild Apricot		EN			+	+	+			+
18	*Betula talassica*	birch species		EN				+				
19	*Betula tianschanica*	birch species		EN			+	+	+			+
20	*Calligonum calcareum*	smartweed species	CR						+			+
21	*Crataegus darvasica*	hawthorn species	CR							+		
22	*Crataegus knorringiana*	hawthorn species	CR						+			
23	*Crataegus necopinata*	hawthorn species	CR							+		
24	*Malus niedzwetzkyana*	wild apple species		EN				+	+	+		+
25	*Malus sieversii*	wild apple species			VU		+	+	+	+		+
26	*Polygonum toktogulicum*	smartweed species	CR						+			
27	*Populus berkarensis*	poplar species	CR					+				
28	*Pyrus cajon*	wild pear species		EN						+		
29	*Pyrus korshinskyi*	wild pear species	CR						+	+		+
30	*Pyrus tadshikistanica*	wild pear species	CR							+		
31	*Ribes malvifolium*	currant species	CR									+
32	*Sibiraea tianschanica*	rose species	CR					+	+			
33	*Swida darvasica*	dogwood species	CR							+		

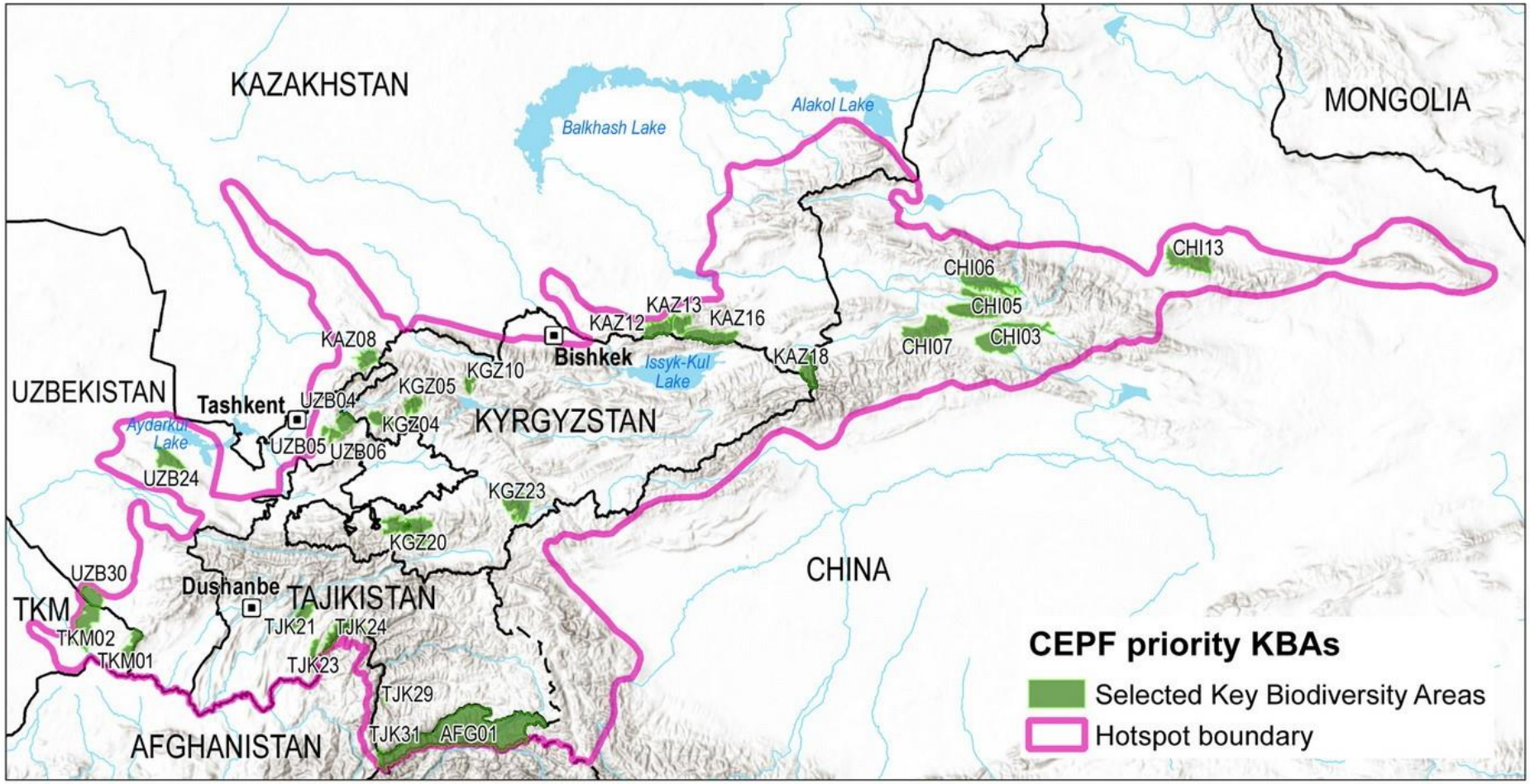
Note: * = includes both Bukhara urial (*Ovis orientalis bocharensis*) and Laddakh Urial (*Ovis orientalis vignei*).

12.2. Priority Sites

The initial prioritization of sites was undertaken by participants at the national and regional consultations, who proposed 90 KBAs (out of the 167 confirmed and candidate KBAs) as priorities for CEPF investment. The criteria used for this exercise included biological importance, site-level threats, opportunities for synergies with other initiatives, and feasibility of project implementation (based on considerations of technical challenges, remoteness, security, border zone restrictions, and political sensitivity). In view of the expected level of CEPF investment in the hotspot, this shortlist of sites was considered too many, even allowing for some redundancy, which is essential for mitigating the political and security risks that can restrict access to parts of the hotspot. Consequently, the following additional criteria were applied by the profiling team, at the request of the CEPF Secretariat:

- Small KBAs were preferred to very large KBAs, where the impacts of CEPF investments could be diluted by sheer size.
- UNESCO World Heritage sites (or candidate sites) were favored, unless they were too large (see previous criterion).

Figure 12.1. Map of priority sites for CEPF investment in the Mountains of Central Asia Hotspot



- Preference was given to KBAs important for highly threatened and narrowly endemic species, unique communities and/or crop wild relatives (that are threatened and/or narrowly endemic).
- KBAs outside or in the buffer zones of protected areas were prefered to strictly protected KBAs that already benefit from a certain level of protection and may present fewer opportunities for civil society involvement.
- Particular preference was given to KBAs that presented opportunities for supporting synergistic activities with GEF Small Grants, larger GEF biodiversity projects and investments by other donors at the local level.

By applying these criteria to the shortlisted KBAs, 28 priority sites were selected (Table 12.2, Figure 12.1). These 28 sites cover a combined area of 38,420 square kilometers, less than five percent of the total area of the hotspot. As with the priority species, the priority sites are distributed across the seven hotspot countries: five each in China, Kazakhstan, Kyrgystan, Tajikistan, and Uzbekistan (to promote programmatic balance), and two in Turkmenistan and one in Afghanistan (reflective of fewer opportunities in those two countries). Priority sites have different combinations of legal protection status, threats and biological values, and require different conservation responses. Table 12.2 summarizes indicative actions for each site, proposed by the participants at the consultations.

Table 12.2. Priority sites for CEPF investment

Code	Name of KBA	Possible actions (indicative only)
Afghanistan		
1	Wakhan National Park	Protection of snow leopard and other species of rare mammals, birds and plants. Biodiversity monitoring and close collaboration and engagement of local communities, diversifying income opportunities and protecting livestock from predation and disease.
China		
3	Bayanbuluke and Kaidu River Valleys *(UNESCO WHS)*	Studies on the number and dynamics of species, suggestions for the optimal natural resources use regime and conservation actions in relation to UNESCO World Heritage site status.
5	Nalati Prairie Nature Reserve	Threatened and endemic species protection and research.
6	Tangbula Forest	Forest protection, conservation of endemic species and genetic resources
7	Gongliu Wild Fruit Forest Nature Reserve	Forest protection, conservation of endemic species and genetic resources.
13	Tianshan Tien Chi Lake (Bogdashan) Nature Reserve *(UNESCO WHS)*	Threatened and endemic species protection and research, and engagement of nature users – especially the tourism sector and infrastructure developers.
Kazakhstan		
8	Aksu-Zhabagly *(UNESCO WHS)*	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of the KBA. Awareness work and cross-border cooperation in relation UNESCO World Heritage site status.
12	Aksay	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of the KBA.
13	Almaty reserve	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of the KBA.

Code	Name of KBA	Possible actions (indicative only)
16	Kolsai	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of the KBA. Special focus on sustainable tourism.
18	Narynkol	Protection of threatened and endemic species, wildlife, and engagement of local nature users and capacity building for more effective functioning of the KBA.
Kyrgyzstan		
4	Kassan-Sai	Protection and responsible management of the riverbed and forest ecosystems, threatened and endemic species with engagement of local nature users.
5	Aflatun-Padyshata *(UNESCO WHS)*	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of the KBA. Awareness work and cross-border cooperation in relation to UNESCO status.
10	Chychkan	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of KBA.
20	Isfairam-Shakhimardan	Protection and responsible management of the juniper forest ecosystems, wildlife and endemic species with engagement with local nature users.
23	Alai-Kuu	Protection of threatened and endemic species, wildlife, and engagement of local nature users and capacity building for more effective functioning of the KBA.
Tajikistan		
21	Baljuvan	Threatened and endemic species protection and research, engagement of local nature users. Reduction of pressures within KBA, including grazing, access to energy, endemic plants collection. Community-managed micro-sites.
23	Dashtijum	Threatened and endemic species protection and research, engagement of local nature users. Reduction of pressures within KBA, including grazing, access to energy. Promotion of community-managed micro-sites.
24	Darvaz	Threatened and endemic species protection, engagement of local nature users. Reduction of pressures within KBA, including grazing, access to energy, unregulated hunting and plants collection. Community-managed micro-sites.
29	Shakhdara	Protection of threatened species and endemics. Genetic resource conservation.
31	Ishkashim	Protection of threatened species and endemics. Genetic resource conservation.
Turkmenistan		
1	Koytendag	Protection of endemic plants, birds of prey and ungulates. Species monitoring and awareness raising among the local population. Reducing pressures from over-grazing and illegal hunting.
2	Tallymerjen	Wetland management focused on the conservation of threatened species. Species monitoring and awareness raising among the local population.
Uzbekistan		
4	Akbulak River Basin (core of Chatkal Biosphere Reserve - *UNESCO WHS)*	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of KBA. Awareness work in relation to UNESCO World Heritage site status, cross-border cooperation.

Code	Name of KBA	Possible actions (indicative only)
5	Bashkyzylsay River Basin (part of Chatkal Biosphere Reserve - *UNESCO WHS)*	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of KBA. Awareness work in relation to UNESCO World Heritage site status, cross-border cooperation.
6	Karabau and Dukentsay River Basins	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of KBA.
24	Nuratau Ridge	Threatened and endemic species protection and research, engagement of local nature users and capacity building for more effective functioning of KBA.
30	Talimarjan Reservoir	Protection of threatened species and globally significant aggregations.

It should be noted that participants at the regional consultation in Almaty agreed in principle to adopt flexible approach to site prioritization. It is important to start with a reasonable number of priority KBAs that allows some flexibility to take advantage of opportunities for synergy that may arise, as well as some redundancy to mitigate risks, while ensuring that CEPF investments remain focused for maximum impact. If there is a significant change to the situation, priorities can be revised by the RIT during the mid-term assessment in consultation with local and regional stakeholders.

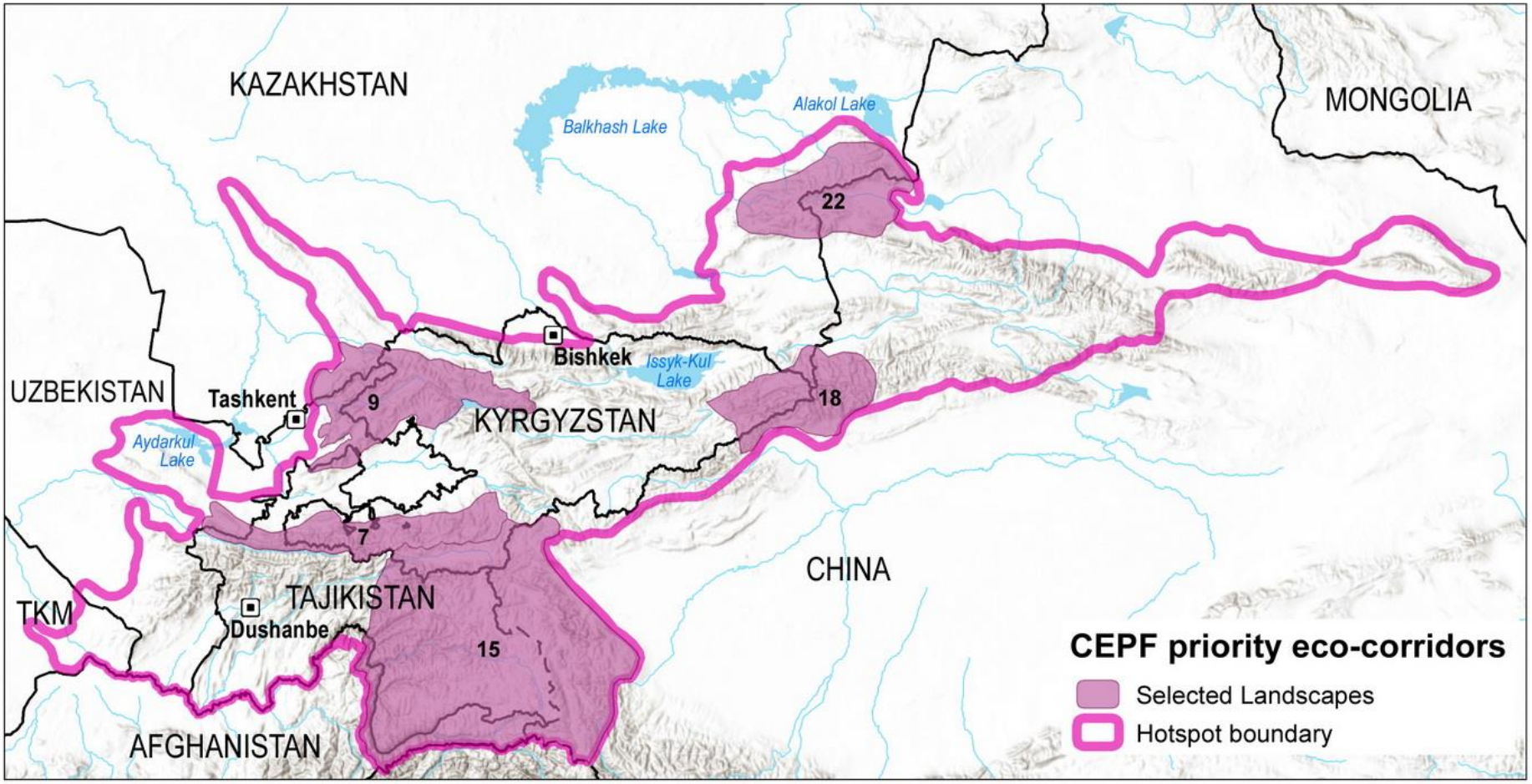
12.3. Priority Corridors

As similar approach was used to prioritize conservation corridors as was used for prioritizing KBAs. An initial list of more than 10 (out of 25) conservation corridors was suggested by participants at the national and regional consultations. Again, this was considered not commensurate with the expected level of CEPF funding in the hotspot, and was further refined through the application of additional criteria, including opportunity for synergy with investments by other funders, and opportunity to engage civil society in the conservation and management of mountain forests, which was one of the strategic priorities to emerge from the consultations (see Section 12.4). Through this process, five corridors were prioritized (Table 12.3, Figure 12.2). These corridors cover a combined area of 251,200 square kilometers, equivalent to 29 percent of the total area of the hotspot. The priority corridors connect key sections of the Tien Shan and Pamir Mountains in China with the Central Asian republics, based on biologcal considerations and economic and infrastructure development trends, thereby creating opportunities to engage civil society in landscape-scale conservation actions. They also cover agglomerations of many identified and potential KBAs.

Table 12.3. Priority Corridors for CEPF investment

Code	Conservation corridor name	Area (km2)	Countries
7	Turkestan and Alai Mountains	23,900	KYR, TJK, UZB
9	Western Tien Shan	34,300	KYR, TJK, UZB
15	Pamir-Alai and Wakhan Mountains	122,000	KYR, TJK, AFG, CHI
18	Khan-Tengri and Tomur Mountains	23,600	KYR, KAZ, CHI
22	Dzungaria	47,400	KAZ, CHI

Figure 12.2. Map of priority corridors for CEPF investment in the Mountains of Central Asia Hotspot



12.4. CEPF Strategic Directions and Investment Priorities

Sections 12.1, 12.2, and 12.3 have identified a series of priority conservation outcomes for species, sites, and corridors to be addressed with the support of CEPF. This section defines how CEPF will address the challenges of conservation to achieve these outcomes. Some strategic directions and investment priorities are specifically directed at species, sites, or corridors. Which direction or priority is relevant for a particular priority species, KBA or corridor depends on specific local ecological, social, and economic circumstances. In developing proposals, potential grantees must show that they have an adequate understanding of these local circumstances and which of the strategic directions and investment priorities are relevant to their situation. Strategic directions are summarized in Table 12.4 and described in greater detail below.

Table 12.4. Strategic Directions and Investment Priorities

CEPF Strategic Directions	CEPF Investment Priorities
1. Address threats to priority species	1.1. Improve enforcement and develop incentives and alternatives for nature users and collectors 1.2. Promote improved regulation of collecting, hunting, and fishing 1.3. Support the development of species-specific reserves and conservation programs 1.4. Prevent human-wildlife conflict by addressing killing, poisoning, and trapping 1.5. Maintain populations of priority species beyond those solely affected by collection, hunting, fishing, poisoning, and nature users
2. Improve management of priority sites with and without official protection status	2.1. Facilitate effective collaboration among CSOs, local communities, and park management units to enhance protected area networks 2.2. Develop and implement management approaches to sustainable use in KBAs outside official protected areas 2.3. Build support and develop capacity for identification and recognition of KBAs

CEPF Strategic Directions	CEPF Investment Priorities
3. Support sustainable management and biodiversity conservation within priority corridors	3.1. Develop protocols and demonstration projects for ecological restoration that improve the biodiversity performance and connectivity of KBAs 3.2. Evaluate and integrate biodiversity and ecosystem service values into land-use and development planning 3.3. Support civil society efforts to analyze development plans and programs, evaluate their impact on biodiversity, communities and livelihoods, and propose alternative scenarios and appropriate mitigating measures
4. Engage communities of interest and economic sectors, including the private sector, in improved management of production landscapes (i.e. priority sites and corridors that are not formally protected)	4.1. Engage hunting associations, tourism operators, and mining companies in conservation management and establishing valuation mechanisms for biodiversity and ecosystem services 4.2. Promote mainstreaming of conservation into livestock and farm management practices 4.3. Promote sustainable forest certification and value chains for non-timber forest products 4.4. Engage with the government and private sector to incorporate site safeguards into infrastructure development 4.5. Engage the media as a tool to increase awareness about globally threatened species and KBAs and inform public debate of conservation issues
5. Enhance civil society capacity for effective conservation action	5.1. Enable and enhance communication and collaboration between civil society and communities and government agencies responsible for implementing national biodiversity strategies 5.2. Enhance civil society organizations' capacity for planning, implementation, outreach, sharing of best practice, fundraising, and communication 5.3. Catalyze networking and collaboration among civil society organizations and between them and public sector partners 5.4. Promote greater sources of funding for civil society to become engaged in conservation action 5.5. Support action-oriented environmental education

CEPF Strategic Directions	CEPF Investment Priorities
6. Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team	6.1. Build a constituency of civil society groups working across institutional and political boundaries toward achieving the shared conservation goals described in the ecosystem profile 6.2. Act as a liaison unit for relevant networks throughout the hotspot to harmonize investments and direct new funding to priority issues and sites

Stakeholders discussed potential strategic directions extensively during the various workshops. The list of six shown here originally consisted of nine (with 35 investment priorities), which were then modified or combined for management efficiency, or deleted, because they did not correspond with CEPF's broader aims or operational policy. Still, CEPF respects the inputs and desires of the stakeholders and considers the framework above to be responsive to their needs. Specifically:

- During consultations, stakeholders suggested several investment priorities focused on science, research, and monitoring. Generation of knowledge is integral to CEPF work and is an inherent part of many of the investment priorities.

- Stakeholders suggested a Strategic Direction exclusively for mountain and riverbed forests, with priorities that included reforestation and alternative energy development. In this version of the framework, instead of focusing on such ecosystems, they factored into the prioritization of KBAs and corridors. CEPF does not have the funding magnitude to support corridor-level reforestation, but may support pilot projects where appropriate.

- During consultations, stakeholders suggested creation of a revolving fund that makes micro-loans to support conservation enterprises. CEPF supports this conceptually, and can make grants directly to entrepreneurs and associations, and can make grants that help with the organization and management of a fund, but CEPF cannot directly capitalize such funds.

- During consultations, stakeholders suggested a strategic direction devoted to higher education and professional development and an investment priority to support individual attendance at internatonal meetings. Certainly, these are important activities. However, CEPF views support for this to be a means to an end – a way to build civil society capacity – but it is not an end in itself. Investement Priority 5.5 allows for this in a limited context.

- During consultations, stakeholders suggested a strategic direction dedicated to climate change response. Instead of having this as a stand-alone focus area, the team prioritized sites and corridors that provide opportunities for enhancing climate resilience.

- During consultations, stakeholders suggested a strategic direction dedicated to cross-border collaboration. Instead of having this as a stand-alone focus, the team prioritized geographically coincident KBAs that are separated by borders. SD 2 (sites) and SD 3 (corridors) both anticipate grants to CSOs working on either side of a border, and as possible, the RIT will be in a position to promote coordination. CEPF will also be in a position to support regional or thematic discussions between parties from multiple countries and will support information exchange. At the same

time, CEPF recognizes the political context and will not engage in grants that create or exacerbate tensions between countries.

Strategic Direction 1: Address threats to priority species

Overexploitation can devastate a species even when its habitat is protected. Species with reduced populations are at increased risk of disease, are less resilient to habitat disturbance, and are less able to compete with invasive alien species.

Some species may be able to withstand limited exploitation, and this may be an effective conservation strategy where exploitation rights can be defined, managed and policed. Where a species or product is important for local livelihoods and economies, it may be possible to find alternatives or to incentivize changes of behavior. For many species, however, legal protection and enforcement of bans on exploitation are required. Enforcement of regulations, quotas and species-focused programs and action plans may be complex, and often depends on the cooperation of local stakeholders. Ultimately, of course, habitat needs to be protected at a viable scale.

The investment priorities here specifically complement actions highlighted for civil society by the Global Snow Leopard Program, the Convention on Migratory Species, the Central Asian Mammals Initiative, and the Raptors MoU.

Investment Priority 1.1: Improve enforcement and develop incentives and alternatives for nature users and collectors

Enforcement occurs on a continuum of education – prevention – interdiction – punishment. With limited government capacity to perform all these roles, CSOs can provide support at the first two levels: they can inform the citizenry why collection or hunting of a species is harmful, they can put up signs and boundary markers, and they can conduct patrols. Grants could provide funding for transportation, equipment, planning, monitoring, data collection, and reporting, among others.

People who are used to collecting or hunting a species may be doing so out of economic need, or species might be threatened due to seemingly benign causes, such as too many visitors to a nature park. In this case, grants could support CSOs that provide alternatives for collectors – perhaps collecting a different plant species, *ex situ* cultivation of a species, or improved pricing schemes for trophy hunting. Nurseries could support recovery of plant endemics and wild fruit trees. CSOs could also help park managers with visitor control, develop alternative sites, and promote best practice in visitor management.

Investment Priority 1.2: Promote improved regulation of collecting, hunting, and fishing

While the legal framework for species protection in the region is well-developed, people do not always know the law or implementing procedures may be lacking. There are further opportunities within the legal structure for local authorities or communities to create licensing schemes. CSOs could analyze policy gaps, inform people about their legal rights and responsibilities, facilitate consultations between communities and legal authorities, use ecological research to set reasonable quotas, use economic research to set prices, and provide inputs to governments and international bodies for improved understanding and traceability of illegally collected species.

Investment Priority 1.3: Support the development of species-specific reserves and conservation programs
Many priority species are found outside existing protected areas. While legislation allows for community-based reserves, there is little precedent for these being created or managed. Grants could support CSO exploration of the legislation to create pilots, could support identification of viable reserve sites, and could twin communities to share best practice. Grants could also help develop action plans for conservation of specific species.

Investment Priority 1.4: Prevent human-wildlife conflict by addressing killing, poisoning, and trapping
CEPF will make grants that specifically address the issue of human-wildlife conflict by making grants to groups that change popular awareness and behavior of relevant communities. This could include grants for training on non-lethal predator control and training on predator-safe animal husbandry.

Investment Priority 1.5: Maintain populations of priority species beyond those solely affected by collection, hunting, fishing, poisoning, and nature users
There are priority species that are not just those under direct threat from local anthropogenic sources. CEPF will support activities that enable a better understanding and protection of breeding grounds or population dynamics. This includes support for biodiversity monitoring and action-oriented research.

Limitations to Strategic Direction 1

- For projects that seek to strengthen enforcement or change human behavior in relation to priority species, CEPF will not award grants that lead to involuntary restriction on access to land or resources.

- For projects that seek to strengthen legal protection for species, CEPF will only award grants in countries that are amenable to such work being undertaken by civil society.

Strategic Direction 2: Improve management of priority sites with and without official protection status

Protected areas are a critical part of the overall effort for the conservation of KBAs, and are likely to become more so as pressure from land-use change increasingly affects them. Protected areas should simultaneously accommodate and respect local customary rights and resource use, although this is often not the case. Some protected areas are the subject of conflicts over land use, mining, or agricultural development, or are poorly managed "paper parks." CEPF will support the improved management of protected areas, which are the backbone of conservation in the hotspot.

At the same time, not all KBAs are within protected areas, nor should they be. Some KBAs are on public land with management designations that offer a degree of legal protection and control over what may and may not happen to them. For example, there are lands designated for catchment protection or sustainable forestry or hunting that is not incompatible with conservation. CEPF will support actions that maintain the conservation value of these KBAs by working with regulations, incentives and technical support to encourage stakeholders managing natural resources (communities, district forest agencies, license holders, etc.) to incorporate biodiversity into their management practices.

Pressure from unsustainable local natural resource use is a threat to KBAs across the hotspot. Models of sustainable, community-based management in a variety of situations are important to convince

government and local stakeholders that such approaches are possible. Likely activities include identification of links between livelihoods and resources, strengthening of local institutions for management, creating links to markets and economic opportunities that give the sustainable management greater value, and building networks of support for the community-based initiatives.

Investment Priority 2.1: Facilitate effective collaboration among CSOs, local communities, and park management units to enhance protected area networks

In most protected areas, legal protection and management bodies reduce the threats from exploitation and development, but are not always able to prevent encroachment, unauthorized grazing, plant collection, or illegal hunting. Funding from the state is often too little in relaton to the size or needs of the protected area. CEPF will support actions that address these challenges, including by working with communities that live around the borders of protected areas and by collaborating with CSOs that can enhance management efficiency by coordinating with the official managers. Grants could support monitoring activities, as well, in relation to the functioning of protected areas (e.g., monitoring of fire or of invasive species).

Several protected areas in the region are along international borders, either along high mountain ridges or along rivers. Grants under this investment priority could be purposefully complementary, where CSOs on either side of a border work with one another and with respective protected area managers. Grants within this investment priority can also purposefully create a better "network" of separate KBAs within one country to allow for possible linkages in a corridor or along an altitudinal gradient.

Investment Priority 2.2: Develop and implement management approaches to sustainable use in KBAs outside official protected areas

KBAs outside protected areas are typically threatened by a combination of licensed exploitation and unlicensed use. Interventions to protect these KBAs are complex because multiple stakeholders and rights may be involved, and because the objective of management is, in most cases, profit rather than protection. Success is likely to be the result of long-term engagement, not a single grant, and so CEPF will support initiatives in which there is a clear stakeholder, community, or company, with management control and rights over the area and commitment to conservation. Conservation actions might include promotition of improved grazing practices, promotion of alternative energy sources to reduce firewood collection, timber certification, and better management of hunting or tourism operations.

Pressure from unsustainable local natural resource use is a challenge for KBAs across the hotspot. Models of sustainable, community-based management in a variety of situations are important to convince government and local stakeholders that such approaches are possible. Likely activities include identification of links between livelihoods and resources, strengthening of local institutions for management, creating links to markets and economic opportunities that give the sustainable management greater value, and building networks of support for community-based initiatives.

Investment Priority 2.3: Build support and develop capacity for identification and recognition of KBAs

CEPF anticipates grants with various objectives under this investment priority, both those that help strengthen the scientific basis to promote formal recognition of sites and those that promote the KBA concept as a means for conservation. First, CEPF expects that some grants will promote recognition of priority sites and the KBA concept (which is new in the region), building on the momentum and capacity of the many stakeholders that participated in the ecosystem profiling process. Second, CEPF anticipates grants that promote recognition of KBAs as part of official policy and regulations. These efforts may include public consultations, enabling experts from universities and CSOs to assist policymakers in

understanding the issues, or engaging influential stakeholders to build support for recognition of KBAs. CEPF will also support the dissemination of information on laws, policies and training necessary to assist enforcement agencies or affected stakeholders in ensuring that the policy produces the intended effect. Monitoring can help demonstrate this effect, and can provide important feedback that policymakers can use to show that their decisions have benefited communities and conservation.

The recognition of KBAs may appear in local or national biodiversity strategies and development and spatial plans, and CEPF will support efforts to encourage adoption of conservation outcomes within these documents. This support might include studies to value ecosystem services from KBAs, good practice examples from other areas, and dissemination of information on polies and laws.

Limitations to Strategic Direction 2

- For projects that seek to strengthen the management of KBAs or formalize the status of protected areas, CEPF will not award grants that lead to involuntary restriction on access to land or resources.

- For projects that seek to work in or around public lands (e.g., in national parks or reserves), CEPF will only award grants in places where local and national officials are amenable to such work being undertaken by civil society.

- For projects that seek to work in KBAs near to sensitive national boundaries, CEPF will take special precautions, in terms of more pre-award due diligence and requests for official endorsement of grantee activities, to ensure that CEPF-supported work does not exacerbate or create political tensions.

Strategic Direction 3: Support sustainable management and biodiversity conservation within priority corridors

A defining feature of this hotspot is its large, uninhabitated landscapes across which roam iconic ungulates and carnivors. The hotspot is also home to wild relatives of cultivated fruit and nut grees, including apple, pear, walnut, apriocot, and pistachio. Corridors of forested areas not only allow movement of threatened species but provide resource-dependent communities with energy, food, income, livelihoods, secure water supply, and protection against natural disasters. Throughout the hotspot, forests are formally owned by the state but may be leased by communities or concessions. Managing these corridors for local human well-being, national economic interest, and conservation is an important goal of CEPF.

Investment Priority 3.1: Develop protocols and demonstration projects for ecological restoration that improve biodiversity performance and connectivity of KBAs

The priority corridors for CEPF investment include forested areas that are home to high-value genetic resources, such as wild apple, walnut, pear, apricot, pistachio, and that also allow for movement of animal species of conservation concern. CEPF will support CSOs that develop better management plans for corridors of a scale appropriately matched to CEPF funding. Thus, this could be in in critical links of habitat between KBAs, or in appropriately-sized areas within priority corridors. The point being, CEPF will not work on largescale restoration, which is beyond its funding scope, but instead promote nurseries growing indigenous species and promote pilot restoration and reforestation efforts. CEPF will

also support monitoring of species and ecosystem services to demonstrate the value and functioning of these corridors.

Investment Priority 3.2: Evaluate and integrate biodiversity and ecosystem service values into land-use and development planning

The hotspot is at the center of major investments related to trade and energy, drawing the engagement of the private sector, the government, CSOs, and donors. At the community level, these investments are not necessarily planned in advance, and when participatory planning exercises are undertaken, they rarely consider biodiversity conservation objectives.

At the same time, a holistic approach of future development paths at the local level is necessary. Forest corridors and grassland landscapes are sometimes seen as having low value in relation to alternatives. CEPF is a position to support projects that promote integration of biodiversity into local planning and policies, and in particular to ensure that such plans and policies take into consideration the long-term sustainable benefits of biodiversity conservation as a means to reduce poverty, improve livelihoods and achieve health and food security.

This investment will encourage existing and incoming development projects with a focus on rural energy, sustainable forestry, and sustainable livestock management, and the government agencies that invite and or approve their presence, to include activities that contribute to the conservation of priority corridors. This could include support for CSOs and communities to engage in planning and direct support for demonstration efforts.

Investment Priority 3.3: Support civil society efforts to analyze development plans and programs; evaluate their impact on biodiversity, communities and livelihoods; and, propose alternative scenarios and appropriate mitigating measures

Building on the previous investment priority, which focuses on the community/local level, this priority focuses on the need to engage directly with the wider development agenda, but again in relation to priority corridors. A key objective of this investment priority is to ensure that corridor conservation is integrated into national/district land use and development plans by providing the opportunity for civil society to engage with planning processes led by government and donors. Civil society organizations will be supported to provide information to decision makers in a form useful for planning, for example decision support tools. Civil society organizations will also be supported to develop alliances and partnerships—in particular with stakeholders from the development sector—in pursuit of joint planning objectives with other stakeholders (for instance, when there is the potential to secure benefits through planning for both biodiversity and livelihoods). Funding could also support civil society organization participation in the preparation of environmental assessments of specific activites (e.g., road construction, mining) and enable civil society organizations to put environmental considerations into policies, plans, and programs. Grants could support CSO-government partnership, CSO-CSO alliances, citizen engagement, ecological monitoring around large development projects, and mainstreaming of biodiversity into landscape level planning (e.g., encouraging reforestation, creating buffer areas around protected areas through agroforestry, etc.)

Limitations to Strategic Direction 3

- For projects that seek to influence economic development plans, CEPF will take special precautions, in terms of more pre-award due diligence and requests for external endorsement

of grantee activities (e.g., from local government or from the managers of a private sector project), to ensure that CEPF-supported work is consonant with local development goals.

Strategic Direction 4: Engage communities of interest and economic sectors, including the private sector, in improved management of production landscapes (i.e., priority sites and corridors that are not formally protected)

KBAs are defined spatial units that can be managed for biodiversity conservation. KBAs can be either formally protected or not. By definition, any place outside of a protected area is, conceivably, a "production landscape": a place where the primary goal might be economic. A production landscape could be as small as an individual farm or as large as a mining concession, as openly managed as a communal mountain grazing area or as controlled as private hunting estate. This strategic direction will support activities that show that economic activities need not be in conflict with sustainable management. Work will take place in priority KBAs, in areas that affect priority KBAs, or in the arena of decision-making about productive practice and could include discussions of agricultural lands (pasture and crop and plantations); forested areas (timber production, non-timber forest products); concession lands (hunting, mining, tourism); and lands set aside for infrastructure development (roads, canals for irrigation, water reservoirs, rail, power transmission lines, pipelines and urban expansion). Work will have a direct impact on priority species, sites, and corridors.

Investment Priority 4.1: Engage hunting associations, tourism operators, and mining companies in conservation management and establishing valuation mechanisms for biodiversity and ecosystem services

Hunting associations, tourism operators, and mining companies that operate in and around KBAs have the potential to become vital partners in conservation. CEPF will support CSOs to engage these groups by educating them about the species and habitats that they affect, by supporting them in the design of better management schemes, and by promoting appropriate mitigation measures (not only measures by individual companies but also grants that support development of voluntary or mandatory standards for certain industries or sectors). Furthermore, a typical problem is that ecosystem services are not properly valued (e.g., trophy prices, park prices, or mineral extraction rights are too low, leading to too much offtake or too little reinvestment in the site) and those values are not incorporated into decision-making or pricing. Grants could assist in valuation and pricing mechanisms that lead to reduced degradation, while still allowing for profitable use. Grants could also support expansion of hunting or tourism that directly supports or leads to improved conservation outcomes.

Investment Priority 4.2: Promote mainstreaming of conservation into livestock and farm management practices

Agriculture and livestock management are integral elements of Central Asian and mountain cultures and economies. However, whether in highly cultivated areas that are expanding up slopes in the Ferghana Valley, or in open access pastureland, poor practice can destroy critical habitats. CEPF will support projects that work at both local levels and in terms of policy. At the local level, CEPF will not support "sutainable grazing" or "sustainable farming" in general. Rather, the purpose of this investment priority is to support grants that demonstrate the causal link between better practice and improved conservation outcomes. This could include projects that encourage moving herding out of forests, actions that allow for forest and grassland regeneration, and the use of crop or livestock species that are less resource intensive (e.g., yaks as opposed to goats). At the policy and planning level, grants could include education on soil and biodiversity conservation practices, introduction of technologies of

sustainable use of water in agriculture, information exchanges, and coaching by practitioners, provided the work is targeted at priority species, sites, and corridors.

Investment Priority 4.3: Promote sustainable forest certification and value chains for non-timber forest products

The legitimate use of mountain forest resources can actually help sustain the forests and support local livelihoods and trade. Forest products that are certified as being sustainably produced gain preferential access to global and regional markets (Blackman and Rivera, 2010), and for many countries and consumers, sustainable forest certification is a requirement. The certification itself confers on the products a legitimacy that makes them more attractive and valuable on domestic and foreign markets. Programs and actions that promote certification of timber and non-timber products, improve value chains, and introduce modern forest products processing technologies may improve the forest conditions and generate benefits for communities.

Investment Priority 4.4: Engage with the government and private sector to incorporate site safeguards into infrastructure development

As the economy in the region develops, KBAs are coming under increasing threat from development projects. Environmental impact assessment legislation is in place in all the countries in the hotspot. Yet enforcement and implementation are weak everywhere, and there are cases of flagrant disregard for environmental legislation. The capacity to conduct environmental impact assessments is limited, and the standards are often low. Given their scientific and conservation expertise, and the political space for independent action in some of the hotspot countries, civil society organizations can play an important role in bridging the gap between good law and bad practice. Further, civil society advocacy and alliances can support government agencies to maintain and perform their legal mandates to protect biodiversity and ensure that environmental safeguards are applied. This is an emergent role for civil society in the hotspot, and it represents a clear niche for CEPF when funding is not available from other donors and when an ability to respond rapidly is frequently required.

This complements, in particular, the specific role highlighted for civil society in international initiatives like the Convention on Migratory Species and Central Asian Mammals Initiative in relation to linear infrastructure: fences, power lines, and roads.

Alongside national environmental impact assessment legislation, many financing institutions use one or more KBA criteria in the application of site safeguard policies in order to avoid, minimize, or mitigate the impacts of projects on natural habitats. These include the World Bank (through its Natural Habitats Policy), the International Finance Corp. (through Performance Standard 6), as well as more than 100 private sector banks (which have adopted the Equator Principles and follow International Finance Corp Standards). Other tools for protecting KBAs and biodiversity in relation to various developments include existing and emerging certification and accreditation schemes (such as those relating to fair trade and sustainability in production of commodities, and the development and implementation of carbon finance projects as applied by the Climate, Community and Biodiversity Alliance). Civil society organization input can ensure that biodiversity safeguards and standards are effectively applied, and that government and industry are aware of them before they commit to investments that could be environmentally damaging.

Advocacy and technical input to environmental impact assessments, review of such assessments, support for consultations with local stakeholders, the building of alliances across different interest

groups, and the development of economic alternatives are all interventions that may be supported by CEPF in response to any KBA coming under threat.

Investment Priority 4.5: Engage the media as a tool to increase awareness about globally threatened species and KBAs, and inform public debate of conservation issues

The hotspot has a diverse range of media and public information centers and services, and governments, CSOs, and donors make provisions for public participation in decision-making and for improved awareness. Significant though these steps have been, they have proven insufficient to fully explain and convey biodiversity concerns to the grassroots level and catalyze responses and behavioral changes. Major CSOs and public environmental information centers as well as civil society networks and services are well-placed to spread information and knowledge about KBAs and inform public debate on biodiversity. One successful approach has been use of the media festivals, expositions, and "Marches for Parks" as tools for raising awareness about conservation issues. Past public awareness campaigns conducted by CSOs on wild apples, tulips, charismatic species have contributed to public debate, interest, and improved knowledge. This investment priority will consolidate and amplify these and other approaches.

Limitations to Strategic Direction 4

- For projects that seek to engage with the private sector, CEPF will be careful to award grants to CSOs with appropriate capacity and in the context of work in which the typical CEPF grantee can be successful. It may be inappropriate, therefore, for grantees to engage with certain sectors in any given country.

- For projects that seek to engage with the private sector, CEPF will take special precautions, in terms of more pre-award due diligence and requests for external endorsement of grantee activities (e.g., from local government or from the managers of a private sector project), to ensure that CEPF-supported work is consonant local national economic priorities.

- For projects that seek to foster public awareness and inform debate around species, sites, and corridors, CEPF will ensure that grantee work is appropriate to local political conditions to increase likelihood of success.

Strategic Direction 5: Enhance civil society capacity for effective conservation action

Chapter 7 notes the need of CSOs for strengthened management, fundraising, and skills, and also notes that they often lack the knowledge and experience to tackle some of the most important threats to the biodiversity in the hotspot. Furthermore, many CSOs working on issues indirectly related to conservation, such as pasture management, disaster risk reduction or community development, have difficulty making the link between their work and environmental considerations or benefits for conservation. Creating sustained improvements in civil society capacity for conservation is an important aim of CEPF, alongside direct conservation impacts. CEPF will support capacity-building to ensure that local CSOs make effective use of grants, and that their actions have a sustainable impact.

The scope for engagement of CSOs is not equal throughout the seven countries of the hotspot. Kygyzstan has a diverse collection of local CSOs that operate independently from the government, and in the Wakhan Valley of Afghanistan, where capacity of local groups is low, there are few legal limits how they can be involved. Kazakh and Tajik CSOs also are welcome to introduce ideas into the policy

arena and can collaborate with public sector authorities on areas of mutual interest (e.g., in a protected area) provided they act appropriately with government mores. Uzbekistan has a strong cadre of CSOs that promote conservation: these organizations either support government initiatives officially, or act as an unofficial arm of the government to build community support for government projects. There are independent CSOs, as well, though access to funding is complicated. In China and Turkmenistan, the strongest CSOs are related to academia, geographic and nature protection societies or associations of forest users, hunters and fishermen.

Investment Priority 5.1: Enable and enhance communication and collaboration between civil society, communities, and government agencies responsible for implementing national biodiversity strategies
At a basic level, citizens and CSOs need "a place at the table," to be informed and to give information, to participate in decisions, and to assist in action. It is unrealistic for citizens and CSOs to expect government to do everything and they must accept responsibilities. Conversely, if government wants CSO assistance, government needs to include CSOs in the decisions.

CEPF grants will support informing citizens and CSOs to their rights and responsibilities. This could involve local information campaigns (on government strategies, laws, rules, regulations), local workshops, or national events so that CSOs and authorities can better work together. Grants will also support efforts to communicate concerns of citizens to authorities, making use of Aarhus centers, rural community *(jamoat)* development centers, and other credible conduits of information.

Investment Priority 5.2: Enhance civil society organizations' capacity for planning, implementation, outreach, sharing of best practice, fund-raising, and communication
A specific issue repeatedly highlighted by CSOs is the lack of capacity to assess the state of the environment, unsustainable exploitation, and the status of key species and habitats. In the absence of information, they find it difficult to ensure that their work is focused and effective. CEPF will support training in simple techniques for assessment of key species, their habitats, environmental variables, and planning conservation interventions.

CSOs with skills in community development and agriculture, and natural resource-based businesses such as tourism, non-timber forest products, and responsible hunting are likely to be important for the success of conservation activities. CEPF grantees are thus likely to be organizations that are working on livelihoods and social and development issues, and that are aware in a general way of the importance of natural resources and ecological services but lack the knowledge to define these links clearly or to address environmental issues in their programs. CEPF will fund capacity building activities that assist CSOs in understanding conservation outcomes and enable them to link their work to biodiversity conservation. Priority for this kind of support will be CSOs with a clear commitment to work in priority sites.

CEPF will also support:

- Basic managerial and organizational strengthening for CSOs that are engaged in conservation in priority sites and corridors, including providng skills training in business operations and fund-raising.
- The documenting and sharing of best practice for species, site, and corridor conservation.

Investment Priority 5.3: Catalyze networking and collaboration among civil society organizations and between them and public sector partners

Stakeholders report the need to build constituencies for action. Subsectors within the CSO community (e.g., conservation groups, forest and land user and hunting associations, public information centers, mountain development) tend to be better at networking within their own subsector than with others, and good opportunities for alliances and collaborative working may be missed as a result. There are existing alliances (e.g., the Central Asia Mountain Partnership; the Alliance of Mountain Communities of Central Asia) that have played crucial roles in targeted support and innovations in sustainable mountain development. CEPF will support existing networks and provide mechanisms to communicate initiatives, results and problems between, for example, different CSOs around a KBA. Linking local CSOs to national and international networks will enhance access to sources of information and funding, and thus improve the sustainability of actions.

Investment Priority 5.4: Promote greater sources of funding for civil society to become engaged in conservation action

Access to funding is a key constraint for many CSOs in the hotspot. Some smaller CSOs become active only when funding is available, and are unable to undertake long-term financial planning. Others "follow the money," adopting new agendas in response to donor priorities and funding. Neither situation supports the development of a knowledgeable, effective CSO community that can take action in support of conservation outcomes. CEPF will support locally appropriate, viable, and innovative mechanisms to increase the broader pool of funding available to civil society. CEPF may support pay-for-performance links between the private sector and CSOs for conservation activities, the creation of innovative funding mechanisms, and schemes that generate sustainable funding for civil society and conservation activities.

Investment Priority 5.5: Support action-oriented environmental education

In certain political contexts, the most appropriate grants will be for support of environmental education, provided it relates to conservation of species or sites. Possible activities include:

- In communities living in KBAs or adjacent to protected areas, grants could support development of curriculum for schools to teach children about environmentally sustainable behavior.
- Support for research on species or sites, within the context of an advanced degree program from a university within the region, the results of which can then be used by a sponsoring NGO.
- Within the framework of an existing university or training institute in the region, provide advanced training to multiple indviduals in the fields of applied biodiversity science.

Limitations to Strategic Direction 5

- CEPF recognizes that the "state of civil society" varies across the seven countries in the hotspot. Similarly, the expectation is that award of grants under this Strategic Direction will also vary. CEPF will be careful to award grants under this Strategic Direction in a way that enables the growth of individual CSOs and the sector, at large, but not in a way that goes against national priorities.

Strategic Direction 6: Provide strategic leadership and effective coordination of conservation investment through a Regional Implementation Team

CEPF Regional Implementation Teams (RIT) support comprehensive, vertically integrated portfolios such as large anchor projects, smaller grassroots activities, policy initiatives, governmental collaboration and

sustainable financing. The RIT converts the plans in the Ecosystem Profile into a cohesive portfolio of grants that exceeds in impact the sum of their parts. The RIT will consist of one or more civil society organizations active in conservation in the region. For example, a team could be a partnership of civil society groups or could be a lead organization with a formal plan to engage others in overseeing implementation, such as through an inclusive advisory committee.

The RIT will be selected by the CEPF Donor Council based on an approved terms of reference, competitive process, and selection criteria available at www.cepf.net. The team will operate in a transparent and open manner, consistent with the CEPF mission and all provisions of the CEPF Operational Manual. Organizations that are members of the RIT are not eligible to apply for other CEPF grants within the same hotspot. CEPF accepts grant applications from formal affiliates of the RIT organizations, provided the applicant has an independent operating board of directors; such applications then receive additional external review.

Investment Priority 6.1: Build a constituency of civil society groups working across institutional and political boundaries toward achieving the shared conservation goals described in the ecosystem

The RIT provides strategic leadership and local knowledge to build a broad constituency of civil society groups working across institutional and political boundaries toward achieving the conservation goals described in the Ecosystem Profile. Given the size and the complexity of the Mountains of Central Asia Hotspot, and considering the Strategic Directions named above, where mainstreaming conservation into development and promoting participation of a wider group of partners is going to be required, the RIT will play a crucial role supporting the consolidation of region-wide networks and identifying regional funding opportunities to leverage and complement CEPF's investment. Major functions of the team will include, but not be limited to:

- Act as an extension service to assist civil society groups in designing, implementing, and replicating successful conservation activities.
- Review all grant applications and manage external reviews with technical experts and advisory committees.
- Award grants up to $20,000 and decide jointly with the CEPF Secretariat on all other applications.
- Lead the monitoring and evaluation of individual projects using standard tools, site visits, and meetings with grantees, and assist the CEPF Secretariat in portfolio-level monitoring and evaluation.
- Widely communicate CEPF objectives, opportunities to apply for grants, lessons learned, and results.
- Involve the existing regional program of the RIT, CEPF donor and implementing agency representatives, government officials, and other sectors within the hotspot in implementation.
- Ensure effective coordination with the CEPF Secretariat on all aspects of implementation.

The RIT will play a critical role in ensuring sharing of lessons between grantees and the replication of success. The expectation of CEPF is that many groups will be trying innovative efforts, either new to the place or new to them. The RIT's job is guide these groups and make connections between them.

In the context of this investment priority, the RIT will undertake the many activities that turn this ecosystem profile into action, including addressing the capacity constraints of many local CSOs, designing CSO engagement methods (e.g., calls for proposals) to yield grant-funded projects that are appropriate within the local political context, and, significantly, incorporating gender into grantee

project design. In much of the discussion to this point (i.e., prioritizing species, sites, and corridors, and designing strategies to ensure their conservation), gender itself has not been explicitly addressed. Rather, it needs to be considered in response to these priorities. In other words, the RIT will:

- In considering local responses to issues of species and KBA conservation, consider the different ways men and women relate to and use the environment. The RIT will design RfPs to solicit, or work directly with applicants to design, projects that address female constraints to participation, ensure gender equitable access to information and decision-making, and promote gender equitable distribution of resources.
- Work with partner CSOs (i.e., grantees) directly to improve gender equity within their organizational structures.

The CEPF Secretariat will work with the RIT, if it does not have its own gender guidelines, to adopt the following best practices (Conservation International 2017):

1. Using gender analysis to understand and examine gender dimensions of individual grant projects and their setting. This includes documenting a project's structure and assessing the capacity of the implementer; exploring gender norms, roles, values, and standards; and identifiying gender-based constraints and opportunities.
2. Adapting and developing project elements and activities.
3. Adapting or developing project indicators for monitoring gender integration.
4. Building the core organizational capacity of the grantee to mainstream gender into its operations (Conservation International 2017).

Investment Priority 6.2: Act as a liaison unit for relevant networks throughout the hotspot to harmonize investments and direct new funding to priority issues and sites

The RIT will act as a hub between a network of CEPF grantees, other CSOs in the region, and donors, helping raise more money and leverage more resources for conservation. The RIT will be a resource for CEPF donors, other donors, and governments to refine the areas throughout the entire hotspot (not only the priority species, sites, and corridors named here) that require additional financial support.

13. LOGICAL FRAMEWORK AND RISK ANALYSIS

Table 13.1. Logical Framework for the Mountains of Central Asia Biodiversity Hotspot

Objectives	Targets	Means of Verification	Links to Aichi Targets	Important Assumptions
Engage civil society in the conservation of globally threatened biodiversity through targeted investments with maximum impact on the highest conservation priorities	15 Key Biodiversity Areas (KBAs), covering 600,000 hectares, have improved management	Grantee and Regional Implementation Team (RIT) performance reports Annual portfolio overview reports; portfolio midterm and final assessment reports Protected Areas Tracking Tool (SP1 METT) Official decrees of creation of new protected areas Civil Society Tracking Tool (CSTT)	**Target 2:** Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes **Target 4:** Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption **Target 7:** Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity	The evolving political and security situation in parts of the hotspot does not require a complete overhaul of geographic priorities for CEPF investment
	60,000 hectares of protected areas are created or expanded			
	2 initiatives launched with private sector stakeholders resulting in adoption or maintenance of biodiversity-friendly practices			
	10 land-use plans or land-use management practices incorporate provisions for biodiversity conservation			
	5 partnerships and networks formed or strengthened among civil society, and with government and communities, to leverage complementary capacities and maximize impact in support of the ecosystem profile			
	At least 20 local organizations receiving CEPF grants demonstrate improved organizational capacity			
	Number of women receiving direct socio-economic benefits through increased income, food security, resource rights, or other measures of human wellbeing from CEPF grants is no less than 40% the number of men			

Intermediate Outcomes	Intermediate Indicators	Means of Verification	Links to Aichi Targets	Important Assumptions
1. Address threats to priority species $1,000,000	Main threats to at least 4 globally threatened species are reduced	Grantee and RIT performance reports CEPF Secretariat supervision mission reports Scientific reports and published assessments Published coastal zone land-use and management plans	**Target 2:** Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes. **Target 12:** The extinction of known threatened species has been prevented.	Drivers of threats to specific species can be addressed within the hotspot countries or through partnerships with others (e.g., for international trade chains)
	4 globally threatened species benefit from strengthened regulation of extractive uses			
	7 informal species-specific reserves are created			
2. Improve management of Key Biodiversity Areas with and without official protection status $2,300,000	600,000 hectares of KBA have improved management	Grantee and RIT performance reports CEPF Secretariat supervision mission reports SP1 METT Scientific reports and published assessments Published management plans	**Target 2:** Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes	Populations of priority species at target sites are not below the threshold for a viable population
	5 KBAs with official protection status have improved management			
	10 KBAs without official protection status have improved management			
3. Support sustainable management and biodiversity conservation within priority corridors $1,500,000	Ecological restoration techniques that improve the functioning of forest ecosystems demonstrated in at least two priority corridors	Grantee and RIT performance reports CEPF Secretariat supervision mission reports Scientific reports and published assessments Local government plans Media articles	**Target 14:** Ecosystems that provide essential services, including water, and contribute to health, livelihoods and well-being, are restored and safeguarded	Increased income will lead to decisions to maintain traditional land-use practices.
	5 local level land use plans incorporate biodiversity conservation as a management objective			
	1 major development project, sub-national plan, or national plan incorporates biodiversity conservation as a management objective			

Intermediate Outcomes	Intermediate Indicators	Means of Verification	Links to Aichi Targets	Important Assumptions
4. Engage communities of interest and economic sectors – including the private sector – in improved management of production landscapes; that is, priority KBAs and corridors that are not formally protected $1,000,000	3 private companies adopt biodiversity-friendly practices Farming or grazing areas, covering at least 50,000 hectares, incorporate biodiversity conservation into operations 10,000 hectares of forest fall under certification schemes, eco-labeling programs, or other market-based management methods Site safeguard requirements are incorporated into development projects in or around 5 KBAs or landscapes At least 5 conservation issues of concern to civil society are the subject of public debate	Grantee and RIT performance reports CEPF Secretariat supervision mission reports Revised protected area management plans Published articles and assessments Decrees for official recognition of protected areas	**Target 4:** Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption	Technically and economically feasible options exist which allow private sector operations to proceed while causing no net biodiversity loss A market for eco-labelled products exists that is willing to pay a sufficiently large premium
5. Enhance civil society capacity for effective conservation action $1,000,000	At least 10 local organizations demonstrate increased knowledge of international and regional conservation agreements and take steps to engage in action at the local level At least 5 regional thematic experience sharing events allow for informal and formal networking in the hotspot 5 new networks or partnerships for conservation are created and/orstrengthened Information on at least 5 funding opportunities for civil society disseminated to relevant organizations, resulting in at least 5 successful funding proposals for continuation or extension of CEPF-funded work Programs delivered to primary/secondary learners in at least 3 priority KBAs 10 advanced degree students receive structured training in applied biodiversity science and/or support for research that leads directly to Intermediate Outcomes 1, 2, or 3	Grantee and RIT performance reports CEPF Secretariat supervision mission reports Meeting minutes and participant lists Press articles in specialized media Signed grant agreements with other donors	**Target 18:** Local knowledge and practice used, respected, and integrated	Civil society will continue to see biodiversity conservation as a valid goal to which to contribute

Intermediate Outcomes	Intermediate Indicators	Means of Verification	Links to Aichi Targets	Important Assumptions
6. Provide strategic leadership and effective coordination of CEPF investment through a Regional Implementation Team $1,200,000	At east 25 local organizations actively participate in conservation actions guided by the ecosystem profile	Grantee and RIT performance reports CEPF Secretariat supervision mission reports CSTTs Gender Tracking Tool Mid-term and Final Assessment Reports	**Target 20:** The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources should increase substantially from the current levels	Suitable organizations are interested and apply to serve as the RIT for the hotspot
	At least 20 local civil society organizations receiving grants demonstrate improved organizational capacity			
	At least 10 local civil society organizations receiving grants demonstrate improved understanding of and commitment to gender issues			
	At least 2 participatory assessments undertaken, documenting lessons learned and best practices from the hotspot.			
	Performance of the RIT assessed as satisfactory during the Mid Term and Final Assessments			
Funding Summary	**Amount**			
Total Budget	$8,000,000			

Table 13.2. Risk Analysis

Risk	Likelihood and severity	Mitigation measures
Program objective: The evolving political and security situation in parts of the hotspot requires a complete overhaul of geographic priorities for CEPF investment	**Likelihood:** medium; the possibility of not working in between 1-3 countries is high **Severity:** The impact on the CEPF program in these countries would be severe, with postponement or minimal grant disbursement. Nevertheless, the risk of problems across all or most of the eligible countries is very low, and so the risk of a complete overhaul of geographic priorities is low Political risks also include the GEF focal points being unable to give a no-objection to the planned program.	**Program level:** Planning for grant-making across all eligible countries reduces the impact of problems in one country on the overall program. Ensuring that the RIT has flexibility in timing and focus of calls for proposals and disbursement of grants allows it to respond to changing situations. **Grant level:** Grants in countries considered high risk will be subject to careful review, and disbursement timetable and monitoring schedules will be adjusted depending on the security situation. Neither grantees nor the RIT will be funded or asked to undertake activities in high-risk areas.
SD1: Political or security situation prevents engagement of CSOs at location of priority species	**Likelihood:** Medium **Severity**: Medium. Even if a particular CSO cannot engage in site-based work, there are ways to influence conservation of the species, including engagement with the government, via the value chain, or via public awareness campaigns	**Program level:** Multiple priority species allow CEPF multiple opportunities for engagement **Grant level:** Analysis by RIT of species, location, and viable applicants prior to release of RfP
SD2: Political or security situation prevents engagement of CSOs at location of priority sites	**Likelihood:** Medium. **Severity**: Severe for relevant sites. Site-based engagement of civil society is fundamental to CEPF approach	**Program level:** Multiple priority sites allow CEPF multiple opportunities for engagement **Grant level:** Analysis by RIT of sites, possible interventions, and viable applicants prior to release of RfP; engagement between RIT and government authorities prior to release of RfP

Risk	Likelihood and severity	Mitigation measures
SD3: Public and private sector stakeholders decline to engage in discussions to mainstream biodiversity because political or economic demands	**Likelihood:** Medium. **Severity:** Severe for relevant sites and corridors. CSOs have limited leverage to force discussions to happen or to outweigh political or economic forces; CEPF does not operate at a financial magnitude to command or demand engagement from host-country government or private sector	**Program level:** RIT resourced and mandated to liaise closely with host-country governments, to ensure good alignment between CEPF investments and national priorities; grant making under this strategic direction will focus on countries with a greater opportunity to engage with and influence public and private sector actors **Grant level:** Grants under this strategic direction must be to CSOs with high capacity and established credibility with government, and may be greater than the average size
SD4: Conservation enterprises and biodiversity-friendly private sector practices do not generate a premium to change behavior	**Likelihood:** High **Severity:** Medium. While creating viable or profitable business models is difficult, actors likely to adopt better practice will not necessarily abandon it and will have positive impact during pilot phase	**Program level:** RIT understanding of opportunities by country and sector prior to release of RfP **Grant level:** Selection of grantees with detailed understanding of business practice and value chain
SD4: Civil society prevented from effectively engaging site safeguard practices	**Likelihood:** Medium **Severity:** High. Infrastructure development that ignores EIA procedures will have extreme impact on species, sites, and corridors	**Program level:** RIT understanding of threats and engagement of government partners throughout the CEPF investment period **Grant level:** Grants under this strategic direction must be to CSOs with appropriate understanding of political process

Risk	Likelihood and severity	Mitigation measures
SD5: The political situation in parts of the hotspot limits engagement of civil society	**Likelihood:** Medium. **Impact**: Medium. The openness of governments to working with civil society is varies across the hotspot, with positive and negative trends in different countries. Future trajectories are difficult to predict. The impact of a negative situation depends on its severity. With most grants expected to be focused on site-based action, immediate grant activities may not be severely affected, except where receiving funds from external sources becomes problematic. However, the intended scaling up of site results to achieve policy impact, by the RIT together with grantees, is likely to be affected by reduction in opportunities to engage with governments.	**Program level:** Grant-making across the eligible countries will reduce the overall risk to the program. The RIT will liaise with grantees and partners (including, for example, World Bank missions and EU delegations) to monitor changing circumstances and develop appropriate responses. **Grant level:** Only a ban on receipt of funds from foreign sources would result in cancellation of grant making in a country. Other limitations might require redesign of project objectives and strategies, for example from being formal managers of protected area to being a partner of a government agency.
SD6: No suitable organizations are interested and apply to serve as the RIT for the hotspot.	**Likelihood:** Low. **Impact:** High. The success of the program is highly dependent on the recruitment of an effective RIT with relevant skills and networks	**Program level:** This is a pre-condition for the commencement of the program, not an assumption for successful program delivery. CEPF will manage the process to ensure that suitable candidates are aware of the call for proposals.

14. SUSTAINABILITY

The prospects for the sustainability of the conservation outcomes of this ecosystem profile are promising. Two completed CEPF biodiversity hotspot projects in nearby regions provide a glimpse of what may occur in the mountains of Central Asia. In the Caucasus, other donors stepped in at the conclusion of CEPF funding, and supported numerous initiatives. Funding came from local and outside sources both large and small. In Southwestern China, the government took over, and local communities kept projects moving forward. These results bode well for what may occur in Central Asia.

At the institutional level, the project's support for capacity building will enhance the professionalism of CSOs across the region. Strategic Direction 5 supports this development, provides valuable experience for local staffs, and prepares the project participants to replicate the project results. In similar fashion, Strategic Directions 3 and 4 mainstream biodiversity into practice among private and public sector agents and at landscape scales. Strategic Direction 6 in turn, provides the opportunity to establish cooperation on an ongoing basis. The Alliance of Central Asian Mountain Communities (AGOCA), with twenty member communities in Kyrgyzstan, Tajikistan, and Kazakhstan, stands as a shining precedent for this type of success. Established in 2003 with outside funding, AGOCA continues to bring village matters to the attention of regional and national policymakers long after the initial grant ran out.

In light of the vast opportunities and challenges related to the conservation of biodiversity in the mountains of Central Asia, CEPF may decide to continue investing in the region after the completion of the first phase of the grant program. Based on the success of the projects and the continuing needs, CEPF has remained in some regions after the first five-year term, and may find reasons to take the same approach in this hotspot. Financial performance and project management will likely improve under CEPF procedures, which are streamlined, and could be adjusted to local circumstances. CEPF can also bring new ideas for sustainable finance mechanisms from other regions and expand experience exchange between the countries.

Identifying and protecting sites that harbor populations of globally threatened species and their key habitats is a cornerstone of the CEPF approach highlighted in Strategic Directions 1 and 2. Small grants targeted at conservation of globally threatened species would ensure that these species receive the attention of the conservation community and serve as indicators for conservation success in the region. While not all KBAs are subject to legal or other forms of protection yet, the new international weight and status of KBAs should attract attention of numerous development players and open the opportunities for conservation by a broad range of actors – from local communities and CSOs to authorities, businesses and donors. Increased cross-frontier cooperation under the Strategic Direction 2 will promote effective conservation at regional scale, which is important since landscapes, species movements and distributions, and threats transcend national boundaries. Given that the impacts of climate change cross national borders and open up new funding prospects to conserve important biodiversity by responding to climate change, work under Strategic Direction 2 and 3 will contribute to sustainability of the CEPF investments, too.

Some CEPF grants may support the development of enterprises that subsequently generate income sufficient to sustain themselves, perhaps in combination with other funding sources. Under Strategic Direction 4, for example, grantees may develop product-based projects – marketing local honey or responsibly harvested fruits and nuts from the wild forests for instance – that spin into ongoing enterprises. Grantees under Strategic Direction 4 may develop tourism and responsible hunting that support communities and become commercially viable and self-sustaining. Model projects to promote

alternative income generation for communities and sustainable use of natural resources are investments that become self-financing in the long run. The Regional Implementation Team (Strategic Direction 6) can also serve as a force for financial sustainability by assisting grantees across all activities to identify funding sources for successive phases. The RIT will also facilitate the sharing of lessons learned and the replication of best practice between grantees.

The potential influence of CEPF on the sustainability of the project extends far beyond assisting grantees in the search for funding, particularly with respect to KBAs. Strategic Direction 2 establishes the base for improved KBA management and for the development of legal and policy instruments. Official conservation maps and regulations can identify and acknowledge the presence of KBAs, and governmental regulations can rely on the designation in prescribing and proscribing activities. This contribution alone could insure the sustainability of the conservation efforts in the mountains of Central Asia. Each addition to policy, legislation and regulations increases the chances of long-term success, just as the more of sites with successful conservation management, the higher chances for overall success across the region.

Given the young median age of the population in the biodiversity hotspot, the sustainability of conservation investments is linked to conservation awareness and education. Limited awareness of the global importance of nature, the means for conservation, and the alternatives may limit the effectiveness and long-term viability of investments. Cross-cutting activities on awareness and education will deepen the sustainability prospects.

The engagement of communities, the private sector, and CSOs across the region lays the groundwork for continuing support for the conservation of biodiversity. The potential for ongoing alliances fostered by CEPF grants and strategic leadership, the increased capacity and professionalism of conservation NGOs, and the adoption of the KBA designation in policies and business practices all support the prospective sustainability of the CEPF investment program in the mountains of Central Asia.

ABBREVIATIONS

ACBK	Association for the Conservation of Biodiversity of Kazakhstan
ADB	Asian Development Bank
AFD	l'Agence Française de Développement
AKF	Aga Khan Foundation
CACILM	Central Asian Countries Initiative for Land Management
CAMI	Central Asian Mammals Initiative
CBD	Convention on Biological Diversity
CEPF	Critical Ecosystem Partnership Fund
CIS	Commonwealth of Independent States
CITES	Convention on International Trade in Endangered Species
CMS	Convention on Migratory Species
CPI	Corruption Perceptions Index
CR	Critically Endangered (IUCN Red List status)
CSO	Civil Society Organization
EBRD	European Bank for Reconstruction and Development
EITI	Extractive Industries Transparency Initiative
EN	Endangered (IUCN Red List category)
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FFI	Flora and Fauna International
G200	Global 200 Eco-regions
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Greenhouse gases
GIZ	German Agency for International Cooperation
GNI	Gross National Income
GSLEP	Global Snow Leopard and Ecosystem Protection Program
IBA	Important Bird and Biodiversity Area
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for the Conservation of Nature
JICA	Japan International Cooperation Agency
KBA	Key Biodiversity Area
MAB	Man and Biosphere Reserve
MEA	Multilateral Environmental Agreement
MoU	Memorandum of Understanding
MSRI	Mountain Societies Research Institute of the University of Central Asia (UCA)
NABU	Naturschutzbund Deutschland (German Nature Conservation Union)
NBSAP	National Biodiversity Strategy and Action Plan
NDC	(Intended) Nationally Determined Contribution
NGO	Non-Governmental Organization
PA	Protected Area
PES	Payment for Ecosystem Services
REC CA	Regional Environment Centre for Central Asia
RIT	Regional Implementation Team (CEPF)
RSPB	Royal Society for the Protection of Birds

SLC	Snow Leopard Conservancy
SLF	Snow Leopard Foundation
SLT	Snow Leopard Trust
UK	United Kingdom
UCA	University of Central Asia
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme / UN Environment since 2017
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
USAID	United States Agency for International Development
VU	Vulnerable (IUCN Red List status)
WCS	Wildlife Conservation Society
WCR	Wild crop relative, also applicable to fruits and nuts
WHC	World Heritage Convention
WWF	World Wide Fund for Nature

REFERENCES

References for the region or multiple countries

Amphibian Survival Alliance. Amphibian Survival Alliance. [accessed 2017 June 30]. http://amphibians.org/

Asian Infrastructure Investment Bank. [accessed 2017 June 30]. http://www.aiib.org/en/index.html

Biodiversity Finance Initiative. BIOFIN. [accessed 2017 June 30]. http://www.biodiversityfinance.net/

BirdLife International Sites & Habitats (IBAs and KBAs). Sites & Habitats (IBAs and KBAs) | BirdLife. [accessed 2017 June 30]. http://www.birdlife.org/worldwide/programmes/sites-habitats-ibas

Blackman A, Rivra J. 2010. The evidence base for environmental and socioeconomic impacts of sustainable certification. Resources for the Future.

Central Asia Regional Environment Centre (CAREC). [accessed 2017 June 30]. http://www.old.carecnet.org/about/

Central Asian Mammals Initiative. Introduction | Central Asian Mammals Initiative. [accessed 2017 June 30]. http://www.cms.int/cami/en/about-cami

Civic Freedom Monitor. ICNL. [accessed 2017 June 30]. http://www.icnl.org/research/monitor/index.html

Conservation GIS Data - The Nature Conservancy. [accessed 2017 June 30]. http://maps.tnc.org/gis_data.html

Conservation International. Guidelines for Integrating Gender into Conservation Programming. http://www.conservation.org/publications/Documents/CI_Gender-Integration-Guidelines-EN.pdf

Conservation Science Data and Tools. WWF. [accessed 2017 June 30]. http://www.worldwildlife.org/pages/conservation-science-data-and-tools

Convention on Migratory Species | CMS. [accessed 2017 June 30]. http://www.cms.int/en/legalinstrument/cms

Corruption Perceptions Index 2016. www.transparency.org. [accessed 2017 June 30]. http://www.transparency.org/news/feature/corruption_perceptions_index_2016

Countries with Biocapacity Reserve. Global Footprint Network. [accessed 2017 June 30]. http://www.footprintnetwork.org/content/documents/ecological_footprint_nations

Crop Wild Relatives Global Portal. Crop Wild Relatives: Crop Wild Relatives Homepage. [accessed 2017 June 30]. http://www.cropwildrelatives.org/

Duysebayeva, TN. The population monitoring of Ranodon sibiricus Kessler. [accessed 2017 June 30]. https://www.zin.ru/journals/trudyzin/doc/vol_317_2/TZ_317_2_Duysebaeva.pdf

ECO Science Foundation. [accessed 2017 June 30]. http://www.eco4science.org/

Ecoregions. Freshwater Ecoregions of the World. [accessed 2017 June 30]. http://www.feow.org/ecoregions

FAO projects. Food and Agriculture Organization of the United Nations. [accessed 2017 June 30]. http://www.fao.org/in-action/fao-projects/en/

Global Biodiversity Information Facility. Free and Open Access to Biodiversity Data | GBIF.org. [accessed 2017 June 30]. http://www.gbif.org/

Global Environment Facility GEF. [accessed 2017 June 30]. http://www.sgp.undp.org/

Hsu. 2007. Environmental Performance Index - Development. Data | Environmental Performance Index - Development. [accessed 2017 June 30]. http://epi.yale.edu/country-rankings

International Union for Conservation of Nature. 2016. A Global Standard for the Identification of Key Biodiversity Areas. Gland. Switzerland.

LakeNet - World Lakes Website. LakeNet - World Lakes Website. [accessed 2017 June 30]. http://www.worldlakes.org/

Langhammer P, Bakarr MI, Bennun LA, Brooks TM, Clay RP, Darwall W, De Silva N, Edgar G, Eken G, Fishpool LDC, *et al.* 2007. Identification and Gap Analysis of Key Biodiversity Areas: Targets for Comprehensive Protected Area Systems. Gland: IUCN.
Olson DM, Dinerstein E. 2002. List of Ecoregions. WWF. [accessed 2017 June 30]. http://wwf.panda.org/about_our_earth/ecoregions/ecoregion_list/
Organisation for Economic Co-operation and Development (OECD) Country Programmable Aid. [accessed 2017 June 30]. http://stats.oecd.org/Index.aspx?DataSetCode=CPA
Organisation for Economic Co-operation and Development (OECD). OECD Development Centre. Social Institutions and Gender Index (SIGI). [accessed 2017 June 30]. http://www.genderindex.org/
Projects. Global Environment Facility. [accessed 2017 June 30]. http://www.thegef.org/projects
Protected Planet. [accessed 2017 June 30]. http://www.protectedplanet.net/
Russian bat research group. [accessed 2017 June 30]. http://zmmu.msu.ru/bats
The Atlas of Global Conservation. [accessed 2017 June 30]. http://maps.tnc.org/globalmaps.html
The IUCN Red List of Threatened Species. The IUCN Red List of Threatened Species. [accessed 2017 June 30]. http://www.iucnredlist.org/
The Plant List — A working list for all plant species. Home - The Plant List. [accessed 2017 June 30]. http://www.theplantlist.org/
Uetz P, Hallermann J. The Reptile Database. The Reptile Database. [accessed 2017 June 30]. http://www.reptile-database.org/
United Nations Framework Convention on Climate Change. 2017 Jun 30. Submitted National Communications from Non-Annex I Parties. Submitted National Communications from Non-Annex I Parties. [accessed 2017 June 30]. http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php
United States Geological Survey. USGS Global Ecosystems: Home. [accessed 2017 June 30]. https://rmgsc.cr.usgs.gov/ecosystems
Vavilov. National Geographic Magazine - NGM.com. National Geographic Magazine - NGM.com. [accessed 2017 June 30]. http://ngm.nationalgeographic.com/print/2011/07/food-ark/siebert-text
What are KBAs & how are they identified? World Database of Key Biodiversity Areas. [accessed 2017 June 30]. http://www.keybiodiversityareas.org/what-are-kbas

References for Afghanistan

Afghanistan National Environmental Protection Agency [accessed 2017 June 30]. http://www.nepa.gov.af/
Wildlife Conservation Society Afghanistan. [accessed 2017 June 30]. https://afghanistan.wcs.org/

References for China

Ito M, Jiang W. 2010. Molecular Phylogeny of the Subfamily Gerbillinae (Muridae, Rodentia) with Emphasis on Species Living in the Xinjiang-Uygur Autonomous Region of China and Based on the Mitochondrial Cytochrome b and Cytochrome c Oxidase Subunit II Genes. BioOne. [accessed 2017 June 30]. http://www.bioone.org/doi/abs/10.2108/zsj.27.269?journalCode=jzoo
Key Laboratory of Oasis Ecology and Desert Environment, CAS----Xinjiang Institute of Geography and Ecology, Chinese Academy of Sciences. [accessed 2017 June 30]. http://english.egi.cas.cn/rh/rd/kloo/
Ministry of Environmental Protection of the People's Republic of China. Ministry of Environmental Protection of the People's Republic of China. [accessed 2017 June 30]. http://english.mep.gov.cn/

Mori Station for Wildlife Survey and Monitoring, XIEG, CAS----Xinjiang Institute of Geography and Ecology, Chinese Academy of Sciences. Mori Station for Wildlife Survey and Monitoring, XIEG, CAS----Xinjiang Institute of Geography and Ecology, Chinese Academy of Sciences. [accessed 2017 June 30]. http://english.egi.cas.cn/rs/sr/mmes/
National Field Station for Grassland Ecosystem in Ordos, Inner Mongolia, China (CERN Station) -Institute of Botany, The Chinese Academy Of Sciences. [accessed 2017 June 30]. http://english.ib.cas.cn/Research/Supporting_System/201303/t20130322_100016.html
School of Geography Science Nanjing Normal University. Home | School of Geography Science of NNU. [accessed 2017 June 30]. http://schools.njnu.edu.cn/geog/
State Key Laboratory of Desert and Oasis Ecology----Xinjiang Institute of Geography and Ecology, Chinese Academy of Sciences. [accessed 2017 June 30]. http://english.egi.cas.cn/rh/rd/hmlzs/
Xinjiang Agriculture University College of Grassland and Environment. [accessed 2017 June 30]. http://chxy.xjau.edu.cn/en/
Xinjiang Institute of Geography and Ecology, Chinese Academy of Sciences. [accessed 2017 June 30]. http://english.egi.cas.cn/et/intro/201303/t20130313_99660.html
Xinjiang Institute of Geography and Ecology, Chinese Academy of Sciences. Publications. [accessed 2017 June 30]. http://english.egi.cas.cn/pub/
Xinjiang Institute of Geography and Ecology, Chinese Academy of Sciences. Publications. [accessed 2017 June 30]. http://english.egi.cas.cn/soci/zrzyxh/

References for Kazakhstan

Aarhus Centre of Almaty Public Foundation. [accessed 2017 June 30]. www.aarhus-almaty.kz
Aarhus Centre of Burabay Public Foundation. [accessed 2017 June 30]. https://www.facebook.com/profile.php?id=100011147589610
Aksu-Zhabagly Nature Reserve. [accessed 2017 June 30]. http://www.aksu-jabagly.kz/
Almaty Forest Center. [accessed 2017 June 30]. http://fhc.kz/
Almaty Province, Department for Nature Protection. [accessed 2017 June 30]. http://www.almatyeco.gov.kz/
Almaty State Nature Reserve. [accessed 2017 June 30]. http://almaty-zapovednik.kz/index.php?lang=ru
Altyn-Emel National Park. [accessed 2017 June 30]. http://www.altyn-emel.kz/
Association for Biodiversity Conservation of Kazakhstan (ABCK). [accessed 2017 June 30]. http://www.acbk.kz/en/
Avalon Public Foundation. [accessed 2017 June 30]. http://www.guide.kz/en/about.shtml
Biogen NGO. [accessed 2017 June 30]. http://www.register-ngo.kz/ru/
Charyn National Park. [accessed 2017 June 30]. http://naturkaz.info/?nacionalmznye_parki/park_charyn
Eco Forum Kazakhstan NGO. [accessed 2017 June 30]. http://eco-forum.kz
European Union Delegations in Central Asia. [accessed 2017 June 30]. https://eeas.europa.eu/delegations/kazakhstan_en
Gavrilov ECCI, Gavrilov AE. 2005. The birds of Kazakhstan. Almaty: Tethys.
GEF Small Grant Programme. [accessed 2017 June 30]. http://www.econet.unesco.kz/r_gef.htm
"Green Academy NGO. [accessed 2017 June 30]. http://www.green-academy.kz/en/"
Green Orda NGO. [accessed 2017 June 30]. www.greenorda.kz
Green Salvation NGO. [accessed 2017 June 30]. http://www.greensalvation.org/en/index.php?page=publications
Green Women NGO. [accessed 2017 June 30]. http://www.greenwomen.kz/
Gvozdev EV, Strautman EI. 1984. Mammals of Kazakhstan. Alma-ata: Nauka of Kazakh S S R.
Ile-Alatay National Park. [accessed 2017 June 30]. http://www.alataupark.kz/?p=44

Institute of Botany. [accessed 2017 June 30]. www.istc.int/ru/institute/13906
Institute of Ecology and Sustainable Development. [accessed 2017 June 30]. http://cadinetwork.org/
Institute of Geography. [accessed 2017 June 30]. https://ingeo.kz/
Institute of Soil Science and Agronomy. [accessed 2017 June 30]. http://kazatu.kz/en/faculties/agronomic-faculty/the-department-of-soil-science-and-agrochemistry/
Institute of Zoology. [accessed 2017 June 30]. http://instzool.kz/
Jabagly-Manas Public Association. [accessed 2017 June 30]. http://oo-gornyy-klub-zhabagly-manas.taraz.bizzlist.kz/
Kansonar association. [accessed 2017 June 30]. http://kansonar.kz/ru
Karatau State Nature Reserve. [accessed 2017 June 30]. http://www.karatau-gpz.kz/
Kazakh National Committee of UNESCO Man and Biosphere. [accessed 2017 June 30]. http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/asia-and-the-pacific/kazakhstan/mab-national-commitee-kazakhstan/
Kazakhstan Agro-forestry Association. [accessed 2017 June 30]. https://www.gfar.net/countries/kazakhstan
Kazakhstan Hunters and Fisherman Society. [accessed 2017 June 30]. http://ohotairibalka.kz/forum.html
Kazakhstan National Agrarian University. [accessed 2017 June 30]. www.kaznau.kz/
Kazakhstan Research Institute on Forestry. [accessed 2017 June 30]. www.gfar.net/.../kazakh-agro-forestry-research-institute
Khrokov VV. 1977. Sociable lapwing in the Tengiz-Kurgaldzhin basin. In: Rare and endangered birds and beasts of Kazakhstan. Almaty.
Kilsay Kolderi National Park. [accessed 2017 June 30]. www.kolsay-kolderi.kz
Lukanovsiy OY, Sklyarenko SL, Meldebekov AM, Grachev UA, Grachev AA, Loginov OV. 2014. The study of snow leopard populations status in Kazakhstan in order to develop conservation measures. Report of the Committee for Forestry and Wildlife Ministry of Agriculture of the Republic of Kazakhstan
Makhaon NGO. [accessed 2017 June 30]. http://www.machaon.eu/altai/
Medeu Nature Park. [accessed 2017 June 30]. http://parkmedeu.kz/ru/
Ministry of Agriculture. [accessed 2017 June 30]. http://mgov.kz/en/
Ministry of Energy. [accessed 2017 June 30]. http://kz.energo.gov.kz/index.php?id=3
Ministry of Foreign Affairs. [accessed 2017 June 30]. http://www.mfa.kz/index.php/en/
Naurzum NGO. [accessed 2017 June 30]. http://www.greensalvation.org/old/Russian/Publish/14_rus/14_11.htm
"Sairam-Ugam National Park. [accessed 2017 June 30]. www.kolsay-kolderi.kz
http://www.sugnpp.kz/index.php/kz/"
Skl͡iarenko SL, Welch GR, Brombacher M. 2008. Important bird areas in Kazakhstan: priority sites for conservation. Almaty: Association for the Conservation of Biodiversity of Kazakhstan (ACBK).
Snow Leopard Foundation NGO. [accessed 2017 June 30]. http://slf.org.pk/
The Red List of Republic of Kazakhstan. [accessed 2017 June 30]. http://www.redbookkz.info/en/
United Nations Development Programme. [accessed 2017 June 30]. http://www.kz.undp.org/content/kazakhstan/ru/home.html
United States Agency for International Development (USAID). [accessed 2017 June 30]. https://www.usaid.gov/kazakhstan
Vasiliev VN. 1970. New species of birches (Betula L.) in Central Asia and Kazakhstan. Systematic News of Embryophyte 7:97–141.
Yashchenko RV. 2006. The reserves of Central Asia and Kazakhstan. IUCN.
Zhongar-Alatau National Park. [accessed 2017 June 30]. http://visitkazakhstan.kz/ru/guide/places/view/528/

References for Kyrgyzstan

I͡Anushevich AI, T͡iurin P. C., I͡Akovleva I.D, Kydyraliyev A, Semenova NI. 1959. Birds of Kyrgystan. Frunze, Izdatelstvo Akademii nauk Kirgizskoĭ SSR.

Kasybekov ES. 1993. The birds of eastern part of Issyk-Kul region: (Kyrghyzstan, Central Asia). Bishkek: Kyrghyz ornithological society.

Lazkov GA, Sultanova BA. 2014. Cadastre of the Flora of Kyrgyzstan. Bishkek.

Solomeshch A. 1997. Red data book of plant communities in the former USSR. Lancaster: Unit of Vegetation Science, Lancaster University.

Umralina AR. 2008. Endemiki i redkie vidy rastenij Kyrgyztana: atlas = Endemic and rare plant species of Kyrgyzstan: atlas. S.l.: s.n.

"Academy of Sciences, Institute of Biology and Soil. [accessed 2017 June 30]. http://www.nas.aknet.kg/eng/index.php?menu=0"

"Academy of Sciences, International Institute of Mountains. [accessed 2017 June 30]. http://www.nas.aknet.kg/eng/index.php?menu=0"

"Academy of Sciences, Tien Shan Mountain Centre. [accessed 2017 June 30]. http://www.nas.aknet.kg/eng/index.php?menu=0"

"Alliance of Central Asian Mountain Communities (AGOCA). [accessed 2017 June 30]. http://agoca.kg/"

"American University in Central Asia. [accessed 2017 June 30]. https://www.auca.kg/ru"

Archa Initiative Public Foundation. [accessed 2017 June 30]. https://www.facebook.com/archa.initiative/

"Association of Forest and Land Users. [accessed 2017 June 30]. http://www.landcoalition.org/en/regions/asia/member/kaflu"

"Beyme-Bet Newspaper. [accessed 2017 June 30]. http://www.mvd.kg/index.php/rus/content-news/itemlist/category/130-betme-bet"

"Biom Ecological movement. [accessed 2017 June 30]. http://www.biom.kg/"

"Bishkek Aarhus Centre Public Foundation. [accessed 2017 June 30]. http://aarhus.kg/ru/orhusskie-tsentry"

"CAMP Alatoo. [accessed 2017 June 30]. http://camp.kg/"

"Central Asia Institute of the Applied Sciences. [accessed 2017 June 30]. http://www.caiag.kg/ru/"

"Central Asia Regional Environment Centre. [accessed 2017 June 30]. http://www.old.carecnet.org/about/stranovye-ofisy/kyrgyzstan/"

"Chintamani Public Foundation. [accessed 2017 June 30]. http://ofchintamani.kyrgyzmedia.com/"

Chon-Kemin State Nature Park. [accessed 2017 June 30]. http://about.kg/nacionalnij-park-chon-kemin#/home

Department Agricultural Sector and Ecology. [accessed 2017 June 30]. http://www.cawater-info.net/water_world/kyrgyzstan_e.htm

"Ecological Information Portal EKO-IS. [accessed 2017 June 30]. http://ekois.net/english-translations-for-kyrgyz-environmental-news-service-ekois/"

"European Union. [accessed 2017 June 30]. https://eeas.europa.eu/delegations/kyrgyz-republic/1396/eu-delegation-kyrgyz-republic_en"

"GEF Small Grant Programme. [accessed 2017 June 30]. http://94.126.173.140/web/countries/KYR/kyrgyzstan.html"

"Global Snow Leopard and Ecosystem Protection Program (GLEPP) Secretariat. [accessed 2017 June 30]. http://www.globalsnowleopard.org/"

"Institute of Biology and Soil, Academy of Sciences. [accessed 2017 June 30]. http://www.nas.aknet.kg/eng/index.php?menu=0"

"Kyrgyz Climate Change Network. [accessed 2017 June 30]. http://www.climatenetwork.org/profile/member/unison"
"Kyrgyz Wildlife Conservation Society. [accessed 2017 June 30]. https://www.wildlife.kg/"
"Kyrgyz-Russian Slavic University, Sustainable Nature Use Association. [accessed 2017 June 30]. http://www.krsu.edu.kg/index.php?lang=ru"
Ministry of Foreign Affairs. [accessed 2017 June 30]. http://www.mfa.gov.kg/
Naryn State Nature Reserve and Bugu Maral. [accessed 2017 June 30]. http://www.open.kg/about-kyrgyzstan/nature/national-parks-and-reserves/54-narynskiy-gosudarstvennyy-zapovednik.html
Osh Aarhus Centre NGO. [accessed 2017 June 30]. http://aarhus.kg/ru/orhusskie-tsentry
"Osh State University, Zoology and Ecology Department. [accessed 2017 June 30]. https://oshtu.kg"
"Osh Technical University. [accessed 2017 June 30]. https://oshtu.kg"
"Public Ecological Expertise. [accessed 2017 June 30]. http://eco-expertise.org/"
"Regional Center of Expertise. [accessed 2017 June 30]. http://rcenetwork.org/portal/rce-kyrgyzstan-2016"
"Rural Development Fund. [accessed 2017 June 30]. http://www.rdf.in.kg/"
"Tien-Shan Research Centre, Academy of Sciences. [accessed 2017 June 30]. http://www.nas.aknet.kg/eng/index.php?menu=0"
"Tree of Life. [accessed 2017 June 30]. http://treelife.org.kg/"
"United Nations Development Programme. [accessed 2017 June 30]. http://www.kg.undp.org/content/kyrgyzstan/ru/home.html"

References for Tajikistan

"Academy of Agricultural Sciences. [accessed 2017 June 30]. http://taas.tj/en/"
"Academy of Sciences, Centre of Innovative Biology. [accessed 2017 June 30]. http://www.anrt.tj/index.php/en/"
"Academy of Sciences. [accessed 2017 June 30]. http://www.anrt.tj/index.php/en/"
"Agency on Forests and Hunting, Department of Protected Areas. [accessed 2017 June 30]. http://www.cawater-info.net/water_world/tajikistan_e.htm"
"Asian Development Bank. [accessed 2017 June 30]. https://www.adb.org/projects/tajikistan"
"Association for the Protection of Forests and Wildlife. [accessed 2017 June 30]. http://www.wildlife-tajikistan.org/policies-and-legal-framework"
"Avesto. [accessed 2017 June 30]. http://istc.int/en/institute/9367"
"CAMP Kukhiston. [accessed 2017 June 30]. http://camp.tj/?language=eng"
"Center on Climate Change and Disaster Risk Reduction. [accessed 2017 June 30]. http://www.fao.org/mountain-partnership/members/members-detail/en/c/43689/"
"Central Asia Regional Environment Centre. [accessed 2017 June 30]. http://www.old.carecnet.org/about/stranovye-ofisy/tadzhikistan/"
"Committee on Environmental Protection, Department on Flora and Fauna. [accessed 2017 June 30]. https://cites.org/eng/cms/index.php/component/cp/country/TJ"
"Committee on Environmental Protection. [accessed 2017 June 30]. https://cites.org/eng/cms/index.php/component/cp/country/TJ"
"Dushanbe Aarhus Centre Public Foundation. [accessed 2017 June 30]. https://aarhus.osce.org/tajikistan/dushanbe"
"Elyor. [accessed 2017 June 30]. http://www.tajikngo.tj/en/-mainmenu-1/item/1468-nazvanie-organizatsii-oo-elyor/1468-nazvanie-organizatsii-oo-elyor.html"
"European Union. [accessed 2017 June 30]. https://eeas.europa.eu/delegations/tajikistan_ru"

GEF Small Grant Programme. [accessed 2017 June 30]. https://sgp.undp.org/index.php?country=105&option=com_countrypages&view=countrypage&Itemid=204
"International Fund for Saving the Aral Sea (IFAS), Tajik Branch [accessed 2017 June 30]. http://ec-ifas.waterunites-ca.org/aral_basin/institutions/ifas/index.html"
"Interstate Commission on Water Coordination (ICWC), Tajik Branch. [accessed 2017 June 30]. http://www.icwc-aral.uz/statute4.htm"
"Kulob Botanical Garden. [accessed 2017 June 30]. http://www.bgci.org/garden.php?id=5166&ftrCountry=&ftrKeyword=&ftrBGCImem=&ftrIAReg="
"Lab for Nature Protection. [accessed 2017 June 30]. http://enrin.grida.no/htmls/tadjik/soe2/eng/htm/nilop.htm"
"Little Earth. [accessed 2017 June 30]. http://www.climatenetwork.org/profile/member/little-earth"
"Mercy Corps. [accessed 2017 June 30]. https://www.mercycorps.org/countries/tajikistan"
"National Biodiversity and Biosafety Center. [accessed 2017 June 30]. http://www.biodiv.tj/en/page?cat=11"
"National Cartography Centre. [accessed 2017 June 30]. http://www.gst.tj/geologiya/natsionalnyj-nauchnyj-tsentr.html"
"Nature Protection Team. [accessed 2017 June 30]. http://www.wildlife-tajikistan.org/policies-and-legal-framework"
"Parastor. [accessed 2017 June 30]. http://www.parastor.iweb.tj/index.php/ru/"
"Pilot Programme for Climate Resilience (PPCR), Tajik Secretariat. [accessed 2017 June 30]. http://www.ppcr.tj/"
"Shifo. [accessed 2017 June 30]. http://www.tajikngo.tj/ru/ngo-info/-othermenu-48/item/949-npo-shifo/ngo-shifo.html"
"Tajik National University, Zoology Department. [accessed 2017 June 30]. http://www.tnu.tj/index.php/ru/en/component/content/article/8-english-categories/50-rector"
The Flora of Tajikistan. USSR NSAPBC RT2003. Volume 7. 1977.
The Flora of Tajikistan. USSR NSAPBC RT2003. Volume 6. 1979.
The Flora of Tajikistan. USSR NSAPBC RT2003. Volume 6. 1980.
The Flora of Tajikistan. USSR NSAPBC RT2003. Volume 6. 1981.
The Red Book of the Republic of Tajikistan. 2015. Institute of Zoology, Academy of Sciences of the Republic of Tajikistan. [accessed 2017 June 30]. http://www.anrt.tj/index.php/en/
Wilcox BA. 1988. 1988 IUCN red list of threatened animals. Gland (Switzerland): International Union for Conservation of Nature and Natural Resources.
"Youth Ecological Center. [accessed 2017 June 30]. http://www.tajikngo.tj/en/ngo-info/item/1405-molodyozhnyiy-ekologicheskiy-tsentr-tadzhikistana.html"
"Youth of the New Century. [accessed 2017 June 30]. http://ef-ca.tj/ngoyonc_eng.html"
"Zan va Zamin. [accessed 2017 June 30]. http://zanvazamin.tj/single?cat=63&id=12"

References for Turkmenistan

Biogeography and Ecology of Turkmenistan. 2013. Springer Verlag.
Desert Institute, State Committee on Nature Protection. [accessed 2017 June 30]. http://www.science.gov.tm/en/organisations/desert_institute/
Saparmuradov, J. 2002. The Siberian Crane Migration in Turkmenistan. – Cranes of Eurasia (distribution, numbers, biology). Eds. V. Morozov and E Ilyashenko. Moscow. P. 183-185 (in Russian with English summary).
"Tebigy Kuwwat. [accessed 2017 June 30]. http://tebigykuwwat.org/"

References for Uzbekistan

Mitropolski, O. V. and Kashkarov, R. D. 2000. Information on size of the population of commercial and hunting species of land vertebral animals in the arid region of Uzbekistan. Pp. 21-30 In: Theile, S. 2002. Ranching and breeding Testudo horsfieldii in Uzbekistan - Report to TRAFFIC Europe.

Academy of Sciences of the Republic of Uzbekistan. [accessed 2017 June 30]. http://academy.uz/uz?mod=sub_sad

"Academy of Sciences, Institute of the Gene Pool of Plants and Animals. [accessed 2017 June 30]. http://www.academy.uz/en/site/slideview/30"

Akhangaran Forest, Uzbekistan Committee on Nature Protection. 2016.

Aramov B. 2011. Proceeding of nature reserves of Uzbekistan. Tashkent. (1).

Beshko N. 2015. Acantholimon zakirovii Beshko (Sect. Staticopsis Boiss., Plumbaginaceae), a new species from north-western Pamir-Alay. Turczaninowia 18:19–26.

Botman E. Forest Rehabilitation in the Republic of Uzbekistan. [accessed 2017 June 30]. http://www.iufro.org/

Brichmullinsk Forest, Uzbekistan Committee on Nature Protection. 2016.

Bukhara deer conservation and restoration. [accessed 2017 June 30]. http://www.wwf.ru/about/where_we_work/asia/closed/bukhara_deer/eng

Chatkal Reserve, Uzbekistan Committee on Nature Protection. 2016.

Conservation and sustainable use of major ecosystems of Uzbekistan. 2014. Tashkent: Uzbekistan Society for the Protection of Birds.

Donald, Azimov, Ball, Green. 2016. A globally important migration staging site for Sociable Lapwings *Vanellus gregarius* in Turkmenistan and Uzbekistan. Sandgrouse 38: 82–95.

Eastwood A, Laz'kov GA, Newton AC. 2009. The red list of trees of Central Asia. Cambridge, UK: Fauna & Flora International.

Eastwood A, Laz'kov GA, Newton AC. 2009. The red list of trees of Central Asia. Cambridge, UK: Fauna & Flora International.

Forest and Biodiversity Governance and Environmental Monitoring in five Central Asian Countries (FLERMONECA) Final Narrative Report. 2016. DCI-ASIE/2013/312-322.

"GEF Small Grant Programme. [accessed 2017 June 30]. http://sgp.uz/"

Hissar Nature Reserve. [accessed 2017 June 30]. http://www.uznature.uz/en

Kashkorov RD, Turaev MT, Azimov N, Ten AG. 2012. New data on the autumn migration Plover Chettusia gregaria in Uzbekistan. 20:138–141.

Kaškarov RD. 2008. Important bird areas in Uzbekistan: priority sites for conservation. Tashkent: Uzbekistan Society for the Protection of Birds (UzSPB).

Khabibullaev AS. 1998. Ŭzbekiston Respublikasi qizil kntobi: noëb va ĭŭqolib ketish khavei ostidagi ŭsimlikva khaĭvon turlari = Krasnaia kniga Respubliki Uzbekistan redkie i nakhodiashchiesia pod ugrozoĭ ischeznoveniia vidy rasteniĭ i zhivotnykh = Red data book of the Republic of Uzbekistan: rare and endangered species of plants and animals. Toshkent: Chinor ENK.

Korshunova EN, Korshunov EN. 2006. TheBlackVultureintheNurataumountains,Uzbekistan. Raptor Conservation:50–60.

"Logos. [accessed 2017 June 30]. http://sreda.uz/index.php?newsid=82"

Management plan of Nuratau-Kyzylkum state biospheric reserve to 2005-2010. State Nature Management Committee, State Biological Control, Society for Avifauna Protection.

Ministry of Agriculture and Water Resources, Republic of Uzbekistan. [accessed 2017 June 30]. http://agro.uz/uz/

"Ministry of Foreign Affairs. [accessed 2017 June 30]. http://mfa.uz/en/"

Nomination Dossier - Western Tien Shan, Proposal for inscription on the UNESCO World Cultural and Natural Heritage List. http://whc.unesco.org/uploads/nominations/1490.pdf.
"Phasianus Student Ornithological Club. [accessed 2017 June 30]. http://www.uzspb.uz/clubs_e.html"
Pimenov M, Tojibaev K. 2011. Kuramosciadium (Umbelliferae): A New Genus from the Uzbekistanian Part of the Western Tian Shan Mountains. Systematic Botany 36:487–494.
Resolution of the Cabinet of Ministers of Uzbekistan No. 142 from 27.05.2013 on the Environment Action Programme 2013-2017.
Resolution of the Cabinet of Ministers of Uzbekistan on Tourism Development in the Tashkent Region 2013-2015.
Sennikov A. 2016. The Flora of Uzbekistan Project. Phytotaxa 282.
Shenbrot G, Sokolov V, Heptner V. 2008. Jerboas: Mammals of Russia and Adjacent Regions. CRC Press.
Shoyakubova R. 2013. the species composition of algoflora and higher plant-hydrophytes of the Aydar-Arnasai lake system.
"State Committee for Nature Protection. [accessed 2017 June 30]. http://www.uznature.uz/en"
Strengthening Sustainability of the National Protected Areas System by Focusing on Strictly Protected Areas. 2013. UNDP.
Surkhan Nature Reserve. [accessed 2017 June 30]. http://www.uznature.uz/en
Tojibaev K, Beshko N, Azimova D, Turginov O. 2015. Distribution patterns of species of the genus Astralalus L. (sect. Macrocystis, Laguropsis and Chaetodon) in the territory of Mountain Middle Asian province. Turczaninowia 18:17–38.
Tojibaev K, Beshko N. 2014. Reassessment of diversity and analysis of distribution inTulipa(Liliaceae) in Uzbekistan. Nordic Journal of Botany 33:324–334.
Tojibaev K, Karimov F. 2016. A new species and new records of Allium (Amaryllidaceae) for Uzbekistan (Central Asia). Phytotaxa 177.
Tojibaev KS, Groot JJD, Naralieva NM. 2014. Tulipa intermediasp. nov. (Liliaceae) from the Ferghana Depression, Uzbekistan. Nordic Journal of Botany 32:546–550.
Tojibaev, Beshko, Azimova, Turginov. 2015. Specific features of species distribution from the Macrocystis, Laguropsis and Chaetodon sections of the genus Astragalus L. in the territory of the Gorno-Median Asian Province. Turczaninowia 18.
"Union for the Defense of the Aral Sea and Amu Darya. [accessed 2017 June 30]. http://www.civilsoc.org/nisorgs/uzbek/aralsea.htm"
"Uzbek Hydrometeorological Service. [accessed 2017 June 30]. http://www.meteo.uz/#/uz"
"Uzbek Society for Birds Protection. [accessed 2017 June 30]. http://www.uzspb.uz/"
Ŭzbekiston Respublikasi qizil kitobi = Krasnai͡a kniga Respubliki Uzbekistan = The Red data book of the Republikc of Uzbekistan. 2006. Toshkent: Chinor.
Ŭzbekiston Respublikasi qizil kitobi = Krasnai͡a kniga Respubliki Uzbekistan = The Red data book of the Republikc of Uzbekistan. 2006. Toshkent: Chinor.
Vvedensky, A.I. (1971) Determinant Plants of Central Asia. V. II. Tashkent
What is Econet? Development of the Econet for long-term conservation of biodiversity in the Central Asia Ecoregions. [accessed 2017 June 30]. http://www.wwf.ru/about/where_we_work/asia/closed/econet/eng/doc897/page1
Williams S, Ibrakhimov M. 2013. Strengthening Sustainability of the National Protected Area System by Focusing on Strictly Protected Areas.
Zeravshan Nature Reserve. [accessed 2017 June 30]. http://www.uznature.uz/en

APPENDICES

Appendix 1. Species outcomes

No.	Scientific Name	Common Name	Global Threat Status			Distribution by Country						
			Critically Endangered	Endangered	Vulnerable	Afghanistan	China	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
MAMMALS			**1**	**4**	**5**							
1	***Cervus hanglu***	**Bukhara Deer**		EN		+	+	+		+	+	+
2	*Equus ferus*	Przewalski's Horse		EN			+	+				+
3	*Gazella subgutturosa*	Goitered Gazelle			VU	+		+	+	+	+	+
4	***Marmota menzbieri***	**Menzbier's Marmot**			VU			+	+	+		+
5	***Ochotona iliensis***	**Ili Pika**		EN			+					
6	***Ovis orientalis****	**Urial**			VU	+		+		+	+	+
7	*Panthera pardus*	Leopard			VU	+				+	+	+
8	***Panthera uncia***	**Snow Leopard**		EN		+	+	+	+	+		+
9	*Saiga tatarica***	Saiga	CR					+				
10	*Vormela peregusna*	Marbled Polecat			VU	+		+	+	+	+	+
BIRDS			**1**	**4**	**12**							
1	***Anser erythropus***	**Lesser White-fronted Goose**			VU			+			+	+
2	***Aquila heliaca***	**Eastern Imperial Eagle**			VU	+	+	+	+	+	+	+
3	***Aquila nipalensis***	**Steppe Eagle**		EN		+	+	+	+	+	+	+
4	*Aythya ferina*	Common Pochard			VU	+	+	+	+	+	+	+
5	*Chlamydotis macqueenii*	Asian Houbara			VU	+	+	+	+	+	+	+
6	*Clanga clanga*	Greater Spotted Eagle			VU	+	+	+	+	+	+	+
7	***Columba eversmanni***	**Yellow-eyed Dove**			VU	+	+	+	+	+	+	+
8	*Falco cherrug*	Saker Falcon		EN		+	+	+	+	+	+	+
9	*Haliaeetus leucoryphus*	Pallas's Fish Eagle			VU	+	+	+	+	+	+	+
10	*Marmaronetta angustirostris*	Marbled Teal			VU	+	+	+	+	+	+	+
11	***Neophron percnopterus***	**Egyptian Vulture**		EN		+	+	+	+	+	+	+
12	*Otis tarda*	Great Bustard			VU	+	+	+	+	+	+	+
13	*Oxyura leucocephala*	White-headed Duck		EN		+	+	+	+	+	+	+
14	*Pelecanus crispus*	Dalmatian Pelican			VU	+	+	+	+	+	+	+
15	*Podiceps auritus*	Horned Grebe			VU	+	+	+	+	+	+	+
16	*Streptopelia turtur*	European Turtle Dove			VU	+	+	+	+	+	+	+
17	***Vanellus gregarius***	**Sociable Lapwing**	CR			+		+	+	+	+	+

No.	Scientific Name	Common Name	Global Threat Status			Distribution by Country						
			Critically Endangered	Endangered	Vulnerable	Afghanistan	China	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
REPTILES			**0**	**0**	**2**							
1	***Phrynocephalus strauchi***	**Strauch's Toad Agama**			**VU**					**+**		**+**
2	*Testudo horsfieldii*	Central Asian tortoise			VU	+	+	+	+	+	+	+
AMPHIBIANS			**0**	**1**	**0**							
1	***Ranodon sibiricus***	**Semirechensk (Xingjian) Salamander**		**EN**			**+**	**+**				
FISHES			**2**	**0**	**4**							
1	*Acipenser nudiventris*	Fringebarbel Sturgeon	CR				+	+				
2	***Aspiolucius esocinus***	**Pike Asp**			**VU**			**+**	**+**	**+**	**+**	**+**
3	*Cyprinus carpio*	Wild Common Carp			VU	+	+	+	+	+	+	+
4	*Luciobarbus brachycephalus*	Roundhead Barbel			VU	+		+	+	+	+	+
5	*Luciobarbus capito*	Turkestan Barbel			VU	+		+	+	+	+	+
6	***Pseudoscaphirhynchus kaufmanni***	**Amudarya Shovelnose Sturgeon**	**CR**			**+**				**+**	**+**	**+**
INVERTEBRATES			**0**	**0**	**3**							
1	*Parnassius apollo*	Mountain Apollo			VU			+	+	+	+	+
2	*Parnassius autocrator*	Pamir Parnassius			VU	+				+		
3	*Saga pedo*	Common Predatory Bush-cricket			VU			+	+	+	+	+
PLANTS			**15**	**10**	**4**							
1	*Aldrovanda vesiculosa*	Waterwheel		EN				+				+
2	*Ammopiptanthus nanus*	legume species	CR				+		+			
3	***Amygdalus bucharica***	**Wild Almond**			**VU**				**+**	**+**		**+**
4	***Armeniaca vulgaris***	**Wild Apricot**		**EN**			**+**	**+**	**+**			**+**
5	*Atraphaxis muschketowi*	Shrubby Buckwheat		EN				+	+			
6	*Berberis iliensis*	barberry species			VU		+	+				
7	***Betula talassica***	**birch species**		**EN**				**+**				
8	***Betula tianschanica***	**birch species**		**EN**			**+**	**+**	**+**			**+**
9	***Calligonum calcareum***	**smartweed species**	**CR**						**+**			**+**
10	*Calligonum elegans*	smartweed species		EN								+
11	***Crataegus darvasica***	**hawthorn species**	**CR**							**+**		
12	***Crataegus knorringiana***	**hawthorn species**	**CR**						**+**			
13	***Crataegus necopinata***	**hawthorn species**	**CR**							**+**		
14	*Lonicera karataviensis*	honeysuckle species	CR					+				

No.	Scientific Name	Common Name	Global Threat Status			Distribution by Country						
			Critically Endangered	Endangered	Vulnerable	Afghanistan	China	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
15	*Lonicera paradoxa*	honeysuckle species		EN					+	+		+
16	***Malus niedzwetzkyana***	**wild apple species**		**EN**				**+**	**+**	**+**		**+**
17	***Malus sieversii***	**wild apple species**			**VU**		**+**	**+**	**+**	**+**		**+**
18	***Polygonum toktogulicum***	**smartweed species**	**CR**						**+**			
19	***Populus berkarensis***	**poplar species**	**CR**					**+**				
20	***Pyrus cajon***	**wild pear species**		**EN**						**+**		
21	***Pyrus korshinskyi***	**wild pear species**	**CR**						**+**	**+**		**+**
22	***Pyrus tadshikistanica***	**wild pear species**	**CR**							**+**		
23	*Rhus coriaria*	Sumac			VU					+		+
24	***Ribes malvifolium***	**currant species**	**CR**									**+**
25	***Sibiraea tianschanica***	**rose species**	**CR**					**+**	**+**			
26	*Spiraeanthus schrenkianus*	rose species		EN				+	+			
27	***Swida darvasica***	**dogwood species**	**CR**							**+**		
28	*Zygophyllum bucharicum*	caltrop species	CR									+
29	*Zygophyllum darvasicum*	caltrop species	CR							+		

Notes: Bold denotes priority species for CEPF investment; * = includes both Bukhara urial (*Ovis orientalis bocharensis*) and Laddakh Urial (*Ovis orientalis vignei*); ** = occurs mainly outside of the hotspot boundaries.

Appendix 2. Globally threatened species no longer present in the Hotspot

No.	Scientific name	Common name	Global threat status
1	*Panthera tigris virgata*	Caspian Tiger	EX
2	*Cuon alpinus*	Dhole	EN
3	*Myotis bucharensis**	Bukhara Whiskered Bat	DD
4	*Pseudoscaphirhynchus fedtchenovii*	Syr-Darya Shovelnose Sturgeon	CR
5	*Pseudoscaphirhynchus hermanni*	Dwarf Sturgeon	CR

Note: * = endemic to hotspot.

Note that the Year of Last Occurrence for each species is not included here because it varies by country and is typically a disputed figure.

Appendix 3. Candidate species outcomes

No.	Scientific name and status	Common name	AFG	CHI	KAZ	KRG	TJK	TKM	UZB
MAMMALS			**7**	**7**	**10**	**9**	**8**	**6**	**9**
1	*Allactaga vinogradovi*, LC	Vinogradov's Jerboa			+	+	+		+
2	*Canis lupus,* LC	Gray Wolf	+	+	+	+	+	+	+
3	*Capra falconeri heptneri*, NT	Markhor	+				+	+	+
4	*Lutra lutra seistanica*, NT	Eurasian Otter	+	+	+	+	+	+	+
5	*Lynx lynx isabellinus,* LC	Turkestan Lynx	+	+	+	+	+	+	+
6	*Lynx lynx wardi*, LC	Altai Lynx			+				
7	*Otocolobus manul*, NT	Pallas's Cat		+	+	+			
8	*Ovis ammon karelini*, NT	Argali		+	+	+			+
9	*Ovis ammon polii*, NT	Marco Polo Sheep	+	+		+	+		
10	*Ovis ammon severtzovi*, NT	Severtzov's Sheep							+
11	*Ovis ammon nigrimontana*, NT	Karatau Sheep			+				
12	*Rhinolophus bocharicus*, LC	Bokhara Horseshoe Bat	+		+	+	+	+	+
13	*Ursus arctos,* LC	Brown Bear	+	+	+	+	+	+	+
BIRDS			**4**	**3**	**4**	**3**	**3**	**1**	**3**
14	*Acrocephalus orinus*, DD	Large-billed Reed Warbler	+		+				
15	*Aegypius monachus*, NT	Cinereous Vulture	+	+	+	+	+	+	+
16	*Gypaetus barbatus*, NT	Bearded Vulture	+	+	+	+	+		+
17	*Gyps himalayensis*, NT	Himalayan Griffon	+	+	+	+	+		+
FISHES			**0**	**0**	**4**	**4**	**0**	**0**	**4**
18	*Alburnoides oblongus* **	Tashkent riffle bleak			+				+
19	*Cottus jaxartensis* **	Chatkal Sculpin			+	+			+
20	*Cottus spinulosus* **	Turkestan Sculpin			+	+			+
21	*Glyptosternum reticulatum* **	Turkestan Catfish				+			+
22	*Leuciscus lindbergi* **	Talas Dace			+	+			
PLANTS			**1**	**3**	**2**	**3**	**1**	**1**	**25**
23	*Abies sibirica semenovii*, LC***	Tien Shan Fir		+	+	+			
24	*Astragalus abolinii**	milkvetch species							+
25	*Astragalus auratus**	milkvetch species							+
26	*Astragalus baranovii**	milkvetch species							+
27	*Astragalus bobrovii**	milkvetch species							+
28	*Astragalus butkovii**	milkvetch species							+
29	*Astragalus lasiocalyx**	milkvetch species							+
30	*Astragalus rubrivenosus**	milkvetch species							+
31	*Astragalus subschachimardanus**	milkvetch species							+
32	*Picea schrenkiana*, LC***	Schrenk's Spruce		+	+	+			
33	*Pistacia vera*, NT	Pistachio	+			+	+	+	+
34	*Saussurea involucrate****	snow lotus species		+		+			
35	*Tulipa affinis**	tulip species							+
36	*Tulipa butkovii**	tulip species							+
37	*Tulipa dasystemon**	tulip species							+
38	*Tulipa dasystemonoides**	tulip species							+
39	*Tulipa ferganica**	tulip species							+
40	*Tulipa fosteriana**	tulip species							+
41	*Tulipa greigii**	tulip species							+
42	*Tulipa ingens**	tulip species							+

No.	Scientific name and status	Common name	AFG	CHI	KAZ	KRG	TJK	TKM	UZB
43	*Tulipa intermedia**	tulip species							+
44	*Tulipa lanata**	tulip species							+
45	*Tulipa mogoltavica**	tulip species							+
46	*Tulipa orythioides**	tulip species							+
47	*Tulipa scharipovii**	tulip species							+
48	*Tulipa tubergeniana**	tulip species							+
49	*Tulipa uzbekistanica**	tulip species							+
50	*Tulipa vvedenskyi**	tulip species							+

Notes: * = narrow endemic assessed by experts in Uzbekistan as meeting the criteria for globally threatened but assessment not yet submitted to the IUCN Red List criteria; ** =narrow endemic; *** = regional endemic, iconic and culturally important; **** = endemic, high-value medical plant, assessed as threatened by overharvesting in China and Kyrgyzstan.

Appendix 4. Site outcomes

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
AFGHANISTAN													
AFG 1	**Wakhan National Park**	1,000,000	A1, B1	+	+	+		+			Y	Y	***Panthera uncia**, Acrocephalus orinus, Parnassius autocrator, Epilobium thermophilum, Astragalus bahrakianus, Echinops wakhanicus, Acantholimon diapensioides, Holosteum kobresietorum, Artemisia leucotricha, Nepeta subincisa, Allium pamiricum, Hymenolaena badachshanica, Cousinia takharensis, [**Ovis orientalis**], [Falco cherrug]*
CHINA													
CHI 1	Pamir Plateau Nature Reserve	670,000	A1, B1	+	+						Y		***Panthera uncia**, Ammopiptanthus nanus, Myricaria pulcherrima*
CHI 2	Tuomuer Nature Reserve	570,000	A1, B1	+	+						Y	Y	***Panthera uncia**, Picea schrenkiana, [**Aquila heliaca**], [Clanga clanga], [Otis tarda], [**Columba eversmanni**], [Saussurea involucrate]*
CHI 3	**Bayanbuluke and Kaidu River Valleys**	240,000	B1, [D1]			+			+		Y	Y	*Aspiorhynchus laticeps, [**Aquila heliaca**], [Falco cherrug], [Haliaeetus leucoryphus], [Podiceps auritus], [Anthropoides virgo], [Grus grus]*
CHI 4	Kunes Forest	90,000	B1	+								Y	*Picea schrenkiana, Fritillaria walujewii, [**Aquila heliaca**], [Clanga clanga], [**Columba eversmanni**], [Haliaeetus leucoryphus]*
CHI 5	**Nalati Prairie Nature Reserve**	280,000	A1, B1		+						Y		***Ochotona iliensis***
CHI 6	**Tangbula Forest**	200,000	B1	+	+								*Picea schrenkiana*
CHI 7	**Gongliu Wild Fruit Forest Nature Reserve (Kalajun-Kuerdening forests and grasslands)**	220,000	B1	+							Y	Y	*Picea schrenkiana, Iljinia regelii, [Juglans cathayensis], [**Aquila heliaca**], [Clanga clanga], [**Columba eversmanni**], [Otis tarda], [**Malus sieversii**]*
CHI 8	Ili River Basin	25,000	B1	+							Y	Y	***Betula tianschanica**, [**Aquila heliaca**], [Aythya baeri], [Clanga clanga], [Falco cherrug], [Haliaeetus leucoryphus], [Otis tarda], [**Malus sieversii**]*
CHI 9	Yining Xiaoyebaila Nature Reserve	14,000	B1	+							Y		*Fraxinus sogdiana*
CHI 10	Xitianshan Nature Reserve	215,000	A1, B1	+	+						Y		***Ochotona iliensis**, Picea schrenkiana, [**Panthera uncia**], [Haliaeetus leucoryphus]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
CHI 11	Wenquan Nature Reserve and River Basin	80,000	A1, B1	+						+	Y		***Ranodon sibiricus**, Saxicola insignis, Sarcozygium kaschgaricum*
CHI 12	Xiaerxili Nature Reserve	28,000	B1	+		+					Y		*Picea schrenkiana, Gymnocarpos przewalskii, Saussurea involucrate [Falco cherrug], [Otis tarda], [Haliaeetus leucoryphus]*
CHI 13	**Tianshan Tien Chi Lake (Bogdashan) Nature Reserve**	150,000	A1, B1	+	+		+				Y	Y	***Ochotona iliensis**, Picea schrenkiana, Teratoscincus roborowskii, [**Aquila heliaca**], [Clanga clanga], [Haliaeetus leucoryphus]*
CHI 14	Jiangbulake Forest	60,000	B1	+									*Picea schrenkiana, [Oxyura leucocephala], [Clanga clanga], [**Aquila heliaca**]*
KAZAKHSTAN													
KAZ 1	Karatau	39,000	B1	+	+	+					Y	Y	*Dryopteris mindshelkensis, Aquilegia karatavica, Eremogone turlanica, **Populus berkarensis**, Acantholimon inczevskii, Arabis mindshilkensis, Stroganowia robusta, Oxytropis echidna, Hedysarum karataviense, Hedysarum mindshilkense, Eryngium karatavicum, Schrenkia kultiassovii, Prangos equisetoides, Karatavia kultiassovii, Rubia pavlovii, Dracocephalum karataviense, Cousinia mindshelkensis, Saussurea mikeschinii, Rhaponticum karatavicum, Tanacetopsis pjataevae, Tulipa alberti, Dracocephalum karataviense, Pseudoeremostachus sewerzowii, , [Vormela peregusna], [**Aquila nipalensis**], [**Aquila heliaca**], [**Neophron percnopterus**], [Falco cherrug], [Otis tarda], [**Columba eversmanni**], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*
KAZ2	Kyzylkol	4,000	A1, D1			+		+				Y	*Aythya ferina, Oxyura leucocephala, Pelecanus crispus, Tadorna ferruginea, [Streptopelia turtur], [Saga pedo]*
KAZ 3	Arystandy	16,000	A1			+						Y	*Otis tarda, [**Aquila heliaca**], [Streptopelia turtur], [Vormela peregusna]*
KAZ 4	Turkestan	58,000	B1	+							Y		*Botschantzevia karatavica, Cotoneaster karatavicus, Cousinia grandifolia, Ferula leucographa, Fraxinus sogdiana, Lepidolopha karatavica, Pseudosedum karatavicum, Rhaphidophyton regelii, Rhaponticum karatavicum, Scutellaria karatavica, Spiraeanthus schrenkianus, Stipa karataviensis, Stroganowia robusta, Thesium minkvitzianum, [**Aquila heliaca**], [**Columba eversmanni**], [**Neophron percnopterus**], [Streptopelia turtur], [Testudo horsfieldii], [Saga pedo], [**Malus sieversii**]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
KAZ 5	Ugam	11,000	A1, B1	+	+						Y		***Marmota menzbieri**, Aconitum talassicum, Arabis popovii, Allium lutescens, Bergenia ugamica, **Betula talassica**, Lepidolopha karatavica, Oxytropis ugamica, Rhaphidophyton regelii, [**Panthera uncia**], [**Neophron percnopterus**], [Falco cherrug], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*
KAZ 6	Tolebi	17,000	A1, B1	+	+						Y		***Marmota menzbieri**, Stroganowia robusta, Ligularia pavlovii, Stipa karataviensis, [**Panthera uncia**], [**Neophron percnopterus**], [Falco cherrug], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*
KAZ 7	Boraldai	8,000	B1	+							Y		*Rhaphidophyton regelii, **Betula talassica**, Lepidolopha karatavica, Stroganowia robusta, Pseudosedum karatavicum, Bergenia ugamica, Cotoneaster karatavicus, Oxytropis talassica, Schrenkia kultiassovii, Rhaponticum karatavicum, Karatavia kultiassovii, Ferula leucographa, Rubia pavlovii, Fraxinus sogdiana, Scrophularia nuraniae, Dracocephalum karataviense, Cousinia grandifolia, Ligularia pavlovii, Allium lutescens, Pseudoeremostachus sewerzowii, Anaphalis racemifera, [Vormela peregusna], [**Aquila heliaca**], [Falco cherrug], [**Neophron percnopterus**], [Streptopelia turtur], [Saga pedo], [**Malus sieversii**]*
KAZ 8	**Aksu-Zhabagly**	70,000	B1	+							Y	Y	*Lepidolopha karatavica, Dryopteris mindshelkensis, **Malus niedzwetzkyana**, Rhaphidophyton regelii, **Betula talassica**, **Betula tianschanica**, Oxytropis talassica, Schrenkia kultiassovii, Karatavia kultiassovii, Lactuca mira, Cousinia grandifolia, Trichanthemis aulieatensis, Iris alberti, Juno kuschakewiczii, Tulipa alberti, Stipa karataviensis, Aconitum talassicum, Anaphalis racemifera, [**Panthera uncia**], [**Aquila nipalensis**], [**Aquila heliaca**], [**Neophron percnopterus**], [Falco cherrug], [Streptopelia turtur], [Parnassius apollo], [Saga pedo], [**Malus sieversii**], , [**Columba eversmanni**]*
KAZ 9	Chakpak Pass and Ters-Ashchibulak Reservoir	13,000	D1			+						Y	*Anthropoides virgo, **Columba eversmanni**, Tadorna ferruginea, Tetrax tetrax, [**Aquila nipalensis**], [**Neophron percnopterus**], [Falco cherrug], [Otis tarda], [Streptopelia turtur]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
KAZ 10	Berikkara	16,000	A1, B1	+							Y		***Populus berkarensis**, Scutellaria karatavica, Lonicera karataviensis, Fraxinus sogdiana, Schtschurowskia margaritae, **Malus sieversii**, [**Aquila heliaca**], [Falco cherrug], [**Neophron percnopterus**], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*
KAZ 11	Merke	65,000	B1	+							Y		*Abelia corymbosa, **Betula tianschanica**, Bupleurum rosulare, Tulipa zenaidae, [**Panthera uncia**], [**Aquila heliaca**], [Falco cherrug], [**Neophron percnopterus**], [Streptopelia turtur], [Parnassius apollo], [**Malus sieversii**]*
KAZ 12	**Aksay**	100,000	B1	+							Y	Y	*Atraphaxis muschketowi, Euphorbia jaroslavii, **Armeniaca vulgaris**, Oxytropis almaatensis, Iris alberti, Gagea neo-popovii, **Malus niedzwetzkyana**, **Malus sieversii**, Tulipa ostrowskiana, **Betula tianschanica**, [**Aquila heliaca**], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*
KAZ 13	**Almaty Nature Reserve**	65,000	A1, B1	+							Y	Y	*Atraphaxis muschketowi, Pastinacopsis glacialis, Hieracium kumbelicum, **Malus niedzwetzkyana**, **Armeniaca vulgaris**, Oxytropis almaatensis, Erysimum croceum, Jurinea almaatensis, Eutrema pseudocordifolium, Iris alberti, Tulipa ostrowskiana, **Sibiraea tianschanica**, [**Panthera uncia**], [Parnassius apollo], [Saga pedo], [**Malus sieversii**]*
KAZ 14	Issyk	85,000	A1, B1	+							Y		*Draba microcarpella, **Betula tianschanica**, Atraphaxis muschketowi, Oxytropis almaatensis, Eutrema pseudocordifolium, **Malus niedzwetzkyana**, **Armeniaca vulgaris**, Hieracium kumbelicum, Pastinacopsis glacialis, Jurinea almaatensis, Nepeta transiliensis, Ikonnikovia kaufmanniana, **Sibiraea tianschanica**, [**Panthera uncia**], [Streptopelia turtur], [Parnassius apollo], [Saga pedo], [**Malus sieversii**]*
KAZ 15	Assy Plateau	37,000	B1	+							Y	Y	***Betula tianschanica**, Jurinea almaatensis, Oxytropis almaatensis, [**Aquila heliaca**], [Falco cherrug], [**Neophron percnopterus**], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*
KAZ 16	**Kolsai**	130,000	B1	+							Y		*Stipa kungeica, **Betula tianschanica**, Erysimum croceum, Hieracium kumbelicum, Jurinea almaatensis, Stelleropsis tianschanica, Picea schrenkiana, [**Panthera uncia**], [Streptopelia turtur], [**Neophron percnopterus**], [Parnassius apollo], [**Aquila heliaca**]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
KAZ 17	Toraigyr	150,000	B1	+								Y	*Silene tianschanica, Ikonnikovia kaufmanniana, Jurinea robusta, Oxytropis niedzweckiana, Ferula iliensis, Ferula sugatensis, Heliotropium parvulum, Tanacetopsis goloskokovii, Galatella saxatilis, Tulipa ostrowskiana, [Gazella subgutturosa], [Vormela peregusna], [Falco cherrug], [**Neophron percnopterus**], [Streptopelia turtur], [**Aquila nipalensis**]*
KAZ 18	**Narynkol**	100,000	B1	+									*Betula jarmolenkoana, Erysimum croceum, Stipa kungeica, [**Panthera uncia**], [**Aquila heliaca**], [Streptopelia turtur], [Parnassius apollo]*
KAZ 19	Tuzkol	3,000	D1			+						Y	*Tadorna ferruginea, [Falco cherrug], [Streptopelia turtur]*
KAZ 20	Charyn Park	85,000	B1	+							Y		*Fraxinus sogdiana, Oxytropis niedzweckiana, Lonicera iliensis, Ferula iliensis, Ferula sugatensis, Galatella saxatilis, Berberis iliensis, [Gazella subgutturosa], [Vormela peregusna], [**Aquila nipalensis**], [**Aquila heliaca**], [**Neophron percnopterus**], [Streptopelia turtur], [Saga pedo], , [Falco cherrug]*
KAZ 21	Altyn-Emel	480,000	A1, B1	+	+						Y		*Equus ferus, Tschulaktavia saxatilis, Ferula iliensis, Lonicera iliensis, Gentiana dshungarica, Lepechiniella michaelis, Asterothamnus fruticosus, Fritillaria pallidiflora, Tulipa brachystemon, Berberis iliensis, [Gazella subgutturosa], [**Aquila nipalensis**], [**Aquila heliaca**], [**Neophron percnopterus**], [Pelecanus crispus], [Aythya ferina], [Oxyura leucocephala], [Chlamydotis macqueenii], [Otis tarda], [**Columba eversmanni**], [Streptopelia turtur], [Parnassius apollo], [Saga pedo], [Equus hemionus]*
KAZ 22	Koksu	240,000	A1, B1	+						+	Y		***Ranodon sibiricus**, Gentiana dshungarica, **Malus sieversii**, [**Panthera uncia**], [**Aquila heliaca**], [Falco cherrug], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*
KAZ 23	Zhongar-Alatau	350,000	A1, B1	+						+	Y		***Ranodon sibiricus**, **Malus niedzwetzkyana**, **Malus sieversii**, Stelleropsis tianschanica, Gentiana dshungarica, Senecio pyroglossus, Fritillaria pallidiflora, Tulipa alberti, [**Panthera uncia**], [**Aquila nipalensis**], [**Aquila heliaca**], [**Neophron percnopterus**], [Streptopelia turtur], [Parnassius apollo], [Saga pedo]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
KYRGYZSTAN													
KYR 1	Besh-Aral	90,000	A1, B1	+	+						Y		***Marmota menzbieri*, *Crataegus knorringiana***, *Crataegus tianschanica, Juno zenaidae, Potentilla kamelinii, Thesium minkwitzianum, Primula eugeniae, Tulipa kaufmanniana, Viola allochroa, [**Panthera uncia**], [**Aquila heliaca**], [Falco cherrug], [**Betula tianschanica**], [**Malus niedzwetzkyana**], [**Malus sieversii**], [**Pyrus korshinskyi**]*
KYR 2	Chandalash	14,000	B1	+							Y		*Astragalus sandalaschensis, Betula czatkalensis, Calophaca pskemica, Hedysarum santalaschi, Psychrogeton adylovii, Seseli tenellum, [**Betula tianschanica**], [Falco cherrug]*
KYR 3	Sumsar	2,000	B1	+									*Acantholimon karabajeviorum, Primula eugeniae*
KYR 4	**Kassan-Sai**	75,000	B1	+									*Hyalolaena intermedia, Saussurea gorbunovae, Seseli giganteum, [**Neophron percnopterus**], [**Malus niedzwetzkyana**], [**Malus sieversii**], [**Pyrus korshinskyi**], [Vormela peregusna]*
KYR 5	**Aflatun-Padyshata**	60,000	B1	+							Y		*Abies semenovii, Allium dodecadontum, Allium viridiflorum, Androsace aflatunensis, Bunium sary-cheleki, Bupleurum ferganense, Corydalis subverticillata, Elisanthe fedtschenkoana, Ferula czatkalensis, Lathyrus dominianus, Primula eugeniae, Pseudosedum ferganense, Silene fetissovii, **Malus niedzwetzkyana**, **Malus sieversii**, [**Panthera uncia**]*
KYR 6	Sary-Chalek	20,000	B1	+							Y		*Abies semenovii, Allium dodecadontum, Allium spathulatum, Allium viridiflorum, Androsace aflatunensis, Bunium sary-cheleki, Campanula eugeniae, **Crataegus knorringiana**, Crataegus tianschanica, Elisanthe fedtschenkoana, Exochorda tianschanica, Ferula czatkalensis, Ferula inciso-serrata, Hedysarum chaitocarpum, Hyalolaena intermedia, Leibnitzia knorringiana, **Malus niedzwetzkyana**, **Malus sieversii**, Onosma brevipilosa, Oxytropis fedtschenkoana, Oxytropis masarensis, Phlomoides urodonta, Pseudosedum ferganense, Saxifraga vvedenskyi, Scutellaria knorringiae, Scutellaria urticifolia, Scutellaria xanthosiphon, Seseli giganteum, Silene eviscosa, Silene fetissovii, Tanacetopsis ferganensis, Tulipa anadroma, [**Panthera uncia**]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
KYR 7	Besh-Tash	50,000	B1	+							Y		*Abies semenovii, Bupleurum ferganense, Campanula eugeniae, Cousinia margaritae, Draba sarycheleki, Kosopoljanskia turkestanica, Neuroloma korovinii, Neuroloma pulvinatum, Onosma trachycarpa, Pyrethrum sovetkinae, Scutellaria popovii*
KYR 8	Talas River	2,000	B1						+		Y		*Leuciscus lindbergi, Dzihunia turdakovi, Triplophysa coniptera*
KYR 9	Nyldy	15,000	B1	+									*Allium dasyphyllum, Kosopoljanskia turkestanica, Neuroloma pulvinatum, Tulipa talassica, [**Betula tianschanica**]*
KYR 10	**Chychkan**	30,000	A1, B1	+							Y		*Abies semenovii, Allium chychkanense, Cotoneaster cinovskisii, **Crataegus knorringiana**, Draba sarycheleki, Juno zenaida, Leibnitzia knorringiana, Salvia vvedenskyi, Seseli korshinskyi, Silene sussamyrica*
KYR 11	Torkent-Kara-Jygach	16,000	B1	+									***Polygonum toktogulicum**, Pyrethrum sovetkinae, Pyrethrum sussamyrense, Salvia vvedenskyi, Scutellaria botbaevae*
KYR 12	Sargata	4,000	B1	+									*Phlomoides korovinii, Phlomoides milkoi, Tanacetopsis korovinii*
KYR 13	Karasu	1,000	B1	+									*Acantholimon linczevskianum, Allium dodecadontum, Allium formosum, Delphinium knorringianum, Festuca tzveleviana, Phlomoides kurpsaica, Scutellaria andrachnoides, Seseli galioides, Seseli korshinskyi, Silene fetissovii, Silene neoladyginae*
KYR 14	Kurp-Sai	4,500	B1	+									*Cousinia abolinii, Phlomoides adylovii, Phlomoides kurpsaica, Scutellaria andrachnoides, Silene fetissovii*
KYR 15	Bekechal	12,000	B1	+									*Allium bekeczalicum, Phlomoides kurpsaica, Pyrethrum brachanthemoides*
KYR 16	Dashman	42,000	B1	+							Y		*Acantholimon knorringianum, Astragalus irisuensis, Campanula eugeniae, Chesneya quinata, Elisanthe fedtschenkoana, Exochorda tianschanica, Hedysarum chaitocarpum, Onosma brevipilosa, Oxytropis masarensis, Pseudosedum ferganense, Primula eugeniae, Salvia schmalhausenii, Scutellaria knorringiae, Scutellaria xanthosiphon, Tanacetopsis ferganensis, [**Pyrus korshinskyi**]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
KYR 17	Kyzyl-Unur	48,000	B1	+									*Astragalus irisuensis, Campanula eugeniae, Exochorda tianschanica, Geranium sophiae, Hedysarum chaitocarpum, Juno zenaidae, Onosma brevipilosa, Oxytropis masarensis, Phlomoides adylovii, Phlomoides cordifolia, Pseudosedum ferganense, Salvia schmalhausenii, Scutellaria xanthosiphon, Silene fetissovii, Seseli korshinskii, Ungernia ferganica, [**Malus niedzwetzkyana**], [**Malus sieversii**], [**Pyrus korshinskyi**]*
KYR 18	Bazar-Korgon	24,000	B1	+									*Astragalus irisuensis, Astragalus kugartensis, Delphinium ferganicum, Elisanthe fedtschenkoana, Exochorda tianschanica, Hedysarum chaitocarpum, Hylotelephium tianschanicum, Juno zenaidae, Oxytropis masarensis, Phlomoides cordifolia, Pseudosedum ferganense, Silene fetissovii, Ungernia ferganica, Eminium regelii, Primula eugeniae, Viola allochroa*
KYR 19	Leilek	66,000	B1	+							Y		*Acantholimon strictiforme, Astragalus neobotschantzevii, Seselopsis pusilla, Incarvillea olgae, Tulipa korolkowii, Corydalis pseudoadunca*
KYR 20	**Isfairam-Shakhimardan**	220,000	B1	+							Y		*Acantholimon langaricum, Astragalus khassanovii, Bupleurum isphairamicum, Cousinia jassyensis, Crataegus isfajramensis, Eremurus zenaidae, Ferula alaica, Ferula subtilis, Incarvillea olgae, Nathaliella alaica, Neuroloma botschantzevii, Neuroloma tianschanicum, Pedicularis popovii, Phlomis drobovii, Phlomoides pulchra, Phlomoides stellata, Physochlaina alaica, Saussurea schachimardanica, Scutellaria nepetoides, Seseli alaicum, Semenovia alaica, Stubendorffia botschantzevii, Stubendorffia curvinervia*
KYR 21	Tuz	55,000	B1	+									*Draba alajica, Iskandera alaica, Littledalea alaica, Paraquilegia scabrifolia, Pulsatilla kostyczewii, Rindera alaica, [**Betula tianschanica**]*
KYR 22	Alai Valley	270,000	B1	+	+		+						*Acantholimon alaicum, Artemisia knorringiana, Draba alajica, Hedysarum daraut-kurganicum, Iskandera alaica, Littledalea alaica, Prangos gyrocarpa, Pulsatilla kostyczewii, Sorbaria olgae, Gloydius rickmersi, Ellobius alaicus, [**Panthera uncia**], [Falco cherrug]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
KYR 23	**Alai-Kuu**	165,000	B1	+							Y		*Acantholimon karadarjense, Acanthophyllum coloratum, Allium zergericum, **Crataegus knorringiana**, Hedysarum chaitocarpum, Helichrysum ferganicum, Nepeta pseudokokanica, Neuroloma tianschanicum, Olgaea vvedenskyi, Onosma azurea, Oxytropis masarensis, Phlomoides cordifolia, [**Panthera uncia**]*
KYR 24	Ak-Sai	90,000	B1	+									*Allium semenovii, Taraxacum syrtorum, Anthropoides virgo*
KYR 25	Chatyr-Kul Lake	22,000	B1, D1	+		+					Y	Y	*Tadorna ferruginea, Tianschaniella umbellifera, [Falco cherrug], Anser indicus*
KYR 26	Kavak-Too and Moldo-Too	12,000	B1	+									*Acantholimon linczevskianum, Cousinia schischkinii, Mogoltavia narynensis, Nepeta narynensis, Seseli luteolum*
KYR 27	Son-Kul Lake	32,000	B1, D1	+		+					Y	Y	*Tadorna ferruginea, Taraxacum syrtorum, [Falco cherrug], [Aythya ferina]*
KYR 28	Kumtor and Sarychat-Ertash	134,000	A1, B1	+	+						Y		***Panthera uncia**, Berberis kaschgarica, Saussurea involucrate, Taraxacum syrtorum, [Falco cherrug]*
KYR 29	Karkyra	67,000	A1, D1	+		+					Y	Y	***Sibiraea tianschanica**, Anthropoides virgo*
KYR 30	Sary-Djaz	300,000	A1, B1	+	+						Y		***Panthera uncia**, Asterothamnus schischkinii, Astragalus dschangartensis, Artemisia saposhnikovii, Artemisia nigricans, Chorispora insignis, Cuscuta syrtorum, Oxytropis chantengriensis, Oxytropis piceetorum, Saussurea involucrata, Saussurea kara-artscha, Seseli kaschgaricum, **Sibiraea tianschanica**, Taraxacum syrtorum*
KYR 31	Eastern Issyk-Kul Lakeshore	68,000	D1			+					Y	Y	*Anthropoides virgo, Netta rufina, Tadorna ferruginea, [Otis tarda], [Chlamydotis undulate], [Numenius tenuirostris]*
KYR 32	Western Issyk-Kul Lakeshore	50,000	B1, D1	+		+					Y	Y	*Netta rufina, Chesneya villosa, [Gavia arctica], [**Vanellus gregarius**], [Aythya ferina]*
TAJIKISTAN													
TJK 1	Aktash	12,000	B1	+			+				Y	Y	***Phrynocephalus strauchi**, Ferula mogoltavica, [Falco cherrug]*
TJK 2	Asht	50,000	B1	+									***Amygdalus bucharica**, Rhus coriaria, [Falco cherrug], [**Malus sieversii**]*
TJK 3	Kayrakkum	100,000	B1	+			+					Y	*Phrynocephalus helioscopus, Eremias scripta pherganensis, Carex bucharica, Cousinia darwasica, Cousinia leptocampyla, Lonicera paradoxa, [**Columba eversmanni**], Anas platyrhynchos, Grus grus, [Chlamydotis undulate], [Otis tarda]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
TJK 4	Turkestan Mountains Southern Slope	50,000	B1	+									*Iskandera hissarica, Lonicera paradoxa, [**Neophron percnopterus**], [**Malus sieversii**], [Falco cherrug]*
TJK 5	Upper Zeravshan	33,000	B1	+									*Blanfordimys bucharensis, Carex bucharica, Cousinia darwasica, Cousinia leptocampyla, Lonicera paradoxa, Blanfordimys bucharensis, [**Panthera uncia**]*
TJK 6	Yagnob	2,000	B1	+									*Acantholimon komarovii, Iris hoogiana, Rochelia claviculata, Roegneria carinata, [Falco cherrug], [**Neophron percnopterus**], [Streptopelia turtur]*
TJK 7	Upper Gissar	30,000	A1, B1	+		+							***Amygdalus bucharica**, Iskandera hissarica, [**Panthera uncia**], [**Malus sieversii**],*
TJK 8	Ramit	66,000	B1	+							Y		*Dracocephalum formosum, Eremurus tadshikorum, Iris hoogiana, Polygonum baldshuanicum, Thuja orientalis, [Clanga clanga], [Falco cherrug], [Testudo horsfieldii]*
TJK 9	Sarikhadang	18,000	B1	+							Y		***Amygdalus bucharica**, Cousinia splendida, Lagochilus kschtutensis, Rhus coriaria, [**Panthera uncia**], [Falco cherrug], [**Malus sieversii**], [**Aquila nipalensis**]*
TJK 10	Kondara	1,000	B1	+	+								*Allium flavellum, Allium lipskyanum, Dracocephalum formosum, Stubendorffia aptera, Thesium gontscharovii, Tulipa praestans, Sorex buchariensis*
TJK 11	Shirkent	8,000	A1, B1	+							Y		***Amygdalus bucharica**, Lonicera paradoxa, Rhus coriaria, Juniperus semiglobosa, [Falco cherrug], [**Neophron percnopterus**], [Testudo horsfieldii], [**Malus sieversii**]*
TJK 12	Karnay	8,000	B1	+									*Astragalus tashkutanus, Gagea holochiton, Gagea villosula, Juniperus semiglobosa, Cousinia splendid [Falco cherrug], [**Neophron percnopterus**]*
TJK 13	Tajik Babatag	85,000	B1	+			+						*Calligonum griseum, Gypsophila tadshikistanica, Gypsophila vedeneevae, Stipa longiplumosa, Stipa ovczinnikovii, Tulipa tubergeniana, Testudo horsfieldii, [**Neophron percnopterus**]*
TJK 14	Gazimalik	70,000	B1	+									*Allium gypsodictyum, Anemone bucharica, Circaetus ferox, Tulipa tubergeniana*
TJK 15	Sarsaryak	20,000	B1	+									*Salvia baldshuanica, Tulipa maximowiczii, Tulipa subpraestans, [Testudo horsfieldii], [Haliaeetus leucoryphus]*
TJK 16	Ayvaj	22,000	A1, B1	+			+		+				*Allium gypsodictyum, Alsophylax tadjikensis, **Pseudoscaphirhynchus kaufmanni**, [**Aspiolucius esocinus**], [Chlamydotis macqueenii]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
TJK 17	Tigrovaya Balka	62,000	A1, B1, D1		+	+			+		Y	Y	***Cervus hanglu***, *Netta rufina,* ***Pseudoscaphirhynchus kaufmanni****, [****Columba eversmanni****], [Falco cherrug], [****Neophron percnopterus****], [****Aspiolucius esocinus****]*
TJK 18	Tajik Karatau	60,000	B1	+							Y		*Anemone bucharica, Ferula decurrens, Tulipa maximowiczii, Tulipa rosea, Tulipa tubergeniana, [Testudo horsfieldii]*
TJK 19	Khojamumin	3,000	B1	+									***Amygdalus bucharica****, Crocus korolkowii, Ostrowskia magnifica, Rhus coriaria*
TJK 20	Kushvoristan	83,000	A1, B1	+							Y	Y	***Amygdalus bucharica****, Amygdalus vavilovii,* ***Crataegus darvasica****, Ostrowskia magnifica, Rhus coriaria*
TJK 21	**Baljuvan**	94,000	A1, B1	+									***Crataegus necopinata****, Iris hoogiana,* ***Pyrus cajon****,* ***Pyrus tadshikistanica****, Ranunculus baldshuanicus, Salvia baldshuanica, Tulipa praestans,* ***Malus sieversii***
TJK 22	Muminabad	46,000	B1	+							Y		*Arabidopsis bactriana,* ***Crataegus necopinata****, Ostrowskia magnifica, Tulipa praestans, Iris hoogiana, Ranunculus baldshuanicus,* ***Pyrus tadshikistanica****, [****Malus sieversii****]*
TJK 23	**Dashtijum**	40,000	A1, B1	+							Y		***Amygdalus bucharica****, Amygdalus vavilovii, Arabidopsis bactriana, Ostrowskia magnifica,* ***Swida darvasica****, Ungernia tadshikorum, Rhus coriaria, [****Columba eversmanni****], [Falco cherrug]*
TJK 24	**Darvaz**	93,000	A1, B1	+							Y		***Crataegus darvasica****,* ***Crataegus necopinata****, Diospyros lotus, Iris darvasica, Kudrjaschevia korshinskyi,* ***Pyrus tadshikistanica****, Rhus coriaria, Tulipa anisophylla, Tulipa linifolia, Ungernia tadshikorum, Zygophyllum darvasicum, [Falco cherrug]*
TJK 25	Kamarou	20,000	B1	+							Y		*Lonicera heterotricha, Taraxacum srtizhoviae, Ungernia tadshikorum, Aquila chrysaetos*
TJK 26	Tavildara	300,000	A1, B1	+	+								*Iris darvasica, Iris hoogiana, Juno popovii, Juno tadshikorum, Lonicera paradoxa, Rosa longisepala,* ***Panthera uncia***
TJK 27	Vanj	7,000	A1, B1	+				+					*Nepeta badachschanica, Parnassius autocrator*
TJK 28	Rushan	5,000	B1	+									*Cicer garanicum, Cicer macracanthus, Hordeum brevisubulatum, Triticum aestivum*
TJK 29	**Shakhdara**	3,000	A1, B1	+									*Lonicera pamirica, Myrtama elegans,* ***Pyrus korshinskyi***
TJK 30	Kudara	30,000	B1	+									*Artemisia kuschakewiczii, Cephalopodum badachschanicum, Lonicera pamirica, Taraxacum murgabicum, Taraxacum tzvelevii, [Falco cherrug],*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
TJK 31	**Ishkashim**	3,500	B1	+									*Acrocephalus orinus, Cicer garanicum, Hordeum brevisubulatum, Hordeum turkestanicum, Triticum aestivum, [Falco cherrug]*
TJK 32	Alichur Valley	6,500	B1	+									*Desideria pamirica, Myrtama elegans, Taraxacum jaschilkuliense, [Falco cherrug]*
TJK 33	Zorkul Mountains	100,000	B1, D1	+		+					Y	Y	*Tadorna ferruginea, Acantholimon alexeenkoanum, Acantholimon varivtzevae, Artemisia kuschakewiczii, Astragalus alexeenkoi, Desideria pamirica, Taraxacum murgabicum, Taraxacum tzvelevii, [**Panthera uncia**], Anser indicus, [**Vanellus gregarius**], Charadrius mongolus*
TJK 34	Shorkul Lake	65,000	D1	+		+						Y	*Tadorna ferruginea, Anser indicus, Charadrius mongolus*
TJK 35	Tajik National Park	2,300,000	A1, B1, D1	+	+	+					Y	Y	***Panthera uncia**, Tadorna ferruginea, Arabidopsis ovczinnikovii, Astragalus alexeenkoi, Clematis hilariae, Desideria pamirica, Piptatherum purpurascens, Potentilla borissi, Pulsatilla kostyczewii, [Clanga clanga], [Falco cherrug], Anser indicus, [**Aquila heliaca**]*
TURKMENISTAN													
TKM 1	**Koytendag**	68,000	B1	+					+		Y	Y	*Astragalus aemulans, Astragalus kahiricus, Astragalus kelifi, Astragalus kuhitangi, Astragalus leiosemius, Astragalus plumbeus, Astragalus rubrigalli, Astragalus willisii, Artemisia tenuisecta, Bunium kuhitangi, Carabus fedtschenkoi, Chesneya tribuloides, Cleome gordjaginii, Cousinia bobrovii, Cousinia dimoana, Cousinia glabriseta, Echinops multicaulis, Echinops praetermissus, Haplophyllum vvedenskyi, Hedysarum plumosum, Hymenocrater incisodentatus, Jurinea tapetodes, Lagochilis nevskii, Lepidolopha fedtschenkoana, Melanoides kainarensis, Melanotus dolini, Onobrychis nikitinii, Oxytropis megalorrhyncha, Pentanema parietarioides, Phlomis spinidens, Rosa bellicosa, Scutellaria heterotricha, Scutellaria leptosiphon, Scutellaria nevskii, Scutellaria squarrosa, Silene nevskii, Tanacetopsis kraschenninikovii, Xylanthemum rupestre, Troglocobitis starostini, [Falco cherrug], [Clanga clanga], [Streptopelia turtur], [Panthera pardus]*
TKM 2	**Tallymerjen**	150,000	D1			+						Y	*Grus grus, Tadorna ferruginea, Vanellus gregarius, [Anser anser]*
TKM 3	Zeyid Reservoir and Kelif Lakes	78,000	D1			+					Y	Y	*Netta rufina, [Pelecanus crispus], Pelecanus onocrotalus, Anas plathyrhynchos, [Aythya ferina], [Leucogeranus leucogeranus]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
UZBEKISTAN													
UZB 1	Pskem River Basin	255,000	A1, B1	+					+		Y	Y	*Cottus jaxartensis, Glyptosternum reticulatum, Acantholimon pskemense, Allium aflatunense, Allium pskemense,* ***Armeniaca vulgaris****, Astragalus abolinii, Astragalus lasiocalyx, Astragalus michaelis, Astragalus pskemensis, Bergenia ugamica,* ***Betula tianschanica****, Cousinia dolichophylla, Cousinia pterolepida, Dimorphosciadium gayoides, Dracocephalum adylovii, Dracocephalum spinulosum, Eremurus lactiflorus, Erysimum aksaricum, Hedysarum drobovii, Jurinea mariae,* ***Malus niedzwetzkyana****, Oxytropis maidantalensis, Pseudoglossanthis simulans, Pyrus asiae-mediae, Tulipa dasystemon, Tulipa dubia, Tulipa dasystemonoides, Tulipa greigii, [****Panthera uncia****], [****Neophron percnopterus****], [****Malus sieversii****]*
UZB 2	Karzhantau Ridge	15,000	B1	+							Y		*Cousinia dolichophylla, Eremurus lactiflorus, Tulipa dubia, Tulipa greigii*
UZB 3	Chimgan	20,000	B1	+							Y		*Acantholimon ekatherinae, Astragalus abolinii, Astragalus baranovii, Dracocephalum spinulosum, Eremurus lactiflorus, Hedysarum drobovii, Nanophyton botschantzevii, Oxytropis fedtschenkoi, Parrya tschimgamica, Phlomoides tschimganica, Tulipa dubia, Tulipa greigii, [****Malus sieversii****]*
UZB 4	**Akbulak River Basin**	65,000	A1, B1	+	+				+		Y	Y	***Marmota menzbieri****, Cottus jaxartensis, Allium aflatunense, Allium dodecadontum, Allium pskemense, Astragalus abolinii, Astragalus rubrivenosus,* ***Betula tianschanica****, Dimorphosciadium gayoides, Dracocephalum komarovii, Dracocephalum spinulosum, Ferula juniperina, Tulipa butkovii, Tulipa dasystemon, Tulipa dubia, [****Malus sieversii****]*
UZB 5	**Bashkyzylsay River Basin**	16,000	B1	+							Y	Y	*Adonis leiosepala, Allium pskemense, Astragalus nucleosus, Astragalus pseudoamygdalinus, Astragalus rubrivenosus, Bunium angreni, Dracocephalum komarovii, Euphorbia mucronulata, Ferula juniperina, Oxytropis fedtschenkoi, Rindera fornicate, Salsola titovii, Salvia tianschanica, Thesium minkvitzianum, Tulipa dubia, Tulipa greigii, [****Neophron percnopterus****], [Falco cherrug], [****Malus sieversii****]*
UZB 6	**Karabau and Dukentsay River Basins**	32,000	B1	+							Y		*Allium pskemense, Astragalus rubrivenosus,* ***Betula tianschanica****, Euphorbia mucronulata, Kamelinia tianschanica, Salsola titovii, Tulipa mogoltavica, Tulipa vvedenskyi, [****Malus sieversii****]*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
UZB 7	Angren Plateau	70,000	A1, B1	+	+							Y	***Marmota menzbieri***, *Vormela peregusna*, *Adonis leiosepala, Bunium angreni, Dimorphosciadium gayoides, Dracocephalum komarovii, Ferula juniperina, Hedysarum angrenicum, Hedysarum popovii, Oxytropis fedtschenkoi, Parrya kuramensis, Parrya saxifraga, Scutellaria angrenica, Tulipa dasystemon, Tulipa dasystemonoides, Tulipa dubia, Tulipa vvedenskyi, Helianthemum songaricum*
UZB 8	Northern Slope of the Kuramin Ridge	68,000	B1	+								Y	*Acantholimon laxiusculum, Acantholimon margaritae, Allium praemixtum, Allium pskemense, Astragalus dolonus, Astragalus nucleosus, Astragalus pseudoamygdalinus, Bunium angreni, Cicer mogoltavicum, Eremurus korovinii, Rindera fornicate, Salsola titovii, Tulipa mogoltavica, Tulipa vvedenskyi, [Falco cherrug], [**Malus sieversii**]*
UZB 9	Upper Reaches of Chadak and Chorkesar Rivers	53,000	B1	+									*Acantholimon laxiusculum, Dracocephalum komarovii, Euphorbia mucronulata, Kuramosciadum corydaliifolium, Tulipa dasystemon, Tulipa dasystemonoides, Tulipa dubia*
UZB 10	Pap Foothills	24,000	B1	+									*Allium haneltii, Allium isakulii, Allium kuramense, Anthochlamys tianschanica, Astragalus austroferganicus, Astragalus pseudodianthus, Dorema microcarpum, Mogoltavia sewerzowii, Salsola drobovii, Tulipa intermedia, Tulipa scharipovii*
UZB 11	Karatag	4,000	B1	+									*Acantholimon nabievii, Allium filidentiforme, Mogoltavia sewerzowii*
UZB 12	Ungor Tepa	2,000	B1	+									*Allium filidentiforme, Allium tatyanae, Allium viridiflorum, Tulipa ferganica*
UZB 13	Chartak Foothills	3,000	B1	+									*Acantholimon nabievii, Hedysarum gypsaceum, Lamyropappus schakaptaricus, Mogoltavia sewerzowii*
UZB 14	Akkum Sands	11,000	A1, B1	+			+				Y		***Phrynocephalus strauchi**, Astragalus rubellus, Astragalus subauriculatus, Calligonum elegans*
UZB 15	Syr Darya Upstream	4,000	B1						+				*Cottus spinulosus*
UZB 16	Teshiktash Foothills	27,000	B1	+									*Salsola drobovii, Tulipa ferganica*
UZB 17	Chilustun and Kyrtashtau Mountains	6,000	B1	+									*Allium alaicum, Astragalus rhacodes, Ferula vicaria, Salsola drobovii, Tulipa ferganica*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
UZB 18	Shakhimardan	4,000	B1	+									*Acantholimon katrantavicum, Acantholimon muchamedshanovii, Acantholimon schachimardanicum, Allium backhousianum, Allium isakulii, Allium schachimardanicum, Astragalus auratus, Astragalus borissianus, Astragalus dianthoides, Astragalus rhacodes, Fergania polyantha, Fumariola turkestanica, Iskandera alaica, Lepidium curvinervium, Lonicera paradoxa, Salsola drobovii, Salvia margaritae, Tulipa dasystemon, Tulipa ferganica*
UZB 19	Sokh	20,000	B1	+									*Astragalus auratus, Astragalus dianthoides,* ***Calligonum calcareum****, Calligonum elegans, Ferula vicaria, Tulipa ferganica*
UZB 20	Northern Slope of the Turkestan Mountains	135,000	B1	+							Y	Y	*Astragalus belolipovii, Astragalus knorringianus,* ***Amygdalus bucharica****, Cousinia haesitabunda, Dracocephalum komarovii, Eremurus chloranthus, Ferula fedtschenkoana, Ferula sumbul, Lonicera paradoxa, Oxytropis kamelinii, Parrya olgae, Serratula lancifolia, Silene paranadena, Tulipa affinis, Tulipa dasystemon, Tulipa dasystemonoides, [****Malus sieversii****]*
UZB 21	Northern Aydarkul	140,000	A1, D1			+						Y	*Pelecanus crispus, Fulica atra, Microcarbo pygmaeus*
UZB 22	Tuzkan Lake	93,000	A1, D1			+						Y	*Pelecanus crispus, Tadorna ferruginea*
UZB 23	Northern Piedmont Plain of Nuratau Ridge	270,000	B1	+	+								*Allactaga vinogradovi, Astragalus kelleri, Tulipa lehmanniana, [Testudo horsfieldii]*
UZB 24	**Nuratau Ridge**	**96,000**	B1	+							Y	Y	*Acantholimon nuratavicum, Acantholimon subavenaceum, Acantholimon zakirovii, Allium isakulii, Allium praemixtum, Allium svetlanae,* ***Amygdalus bucharica****, Anura pallidivirens,* ***Armeniaca vulgaris****, Astragalus kelleri, Astragalus knorringianus, Astragalus leptophysus, Astragalus stipulosus, Cicer grande, Cousinia dshisakensis, Eremurus nuratavicus, Erysimum nuratense, Ferula sumbul, Helichrysum nuratavicum, Jurinea zakirovii, Lagochilus olgae, Lagochilus proskorjakovii, Lepidium olgae, Lepidolopha nuratavica, Nanophyton saxatile, Oxytropis pseudorosea, Parrya olgae, Parrya sarawschanica, Phlomis nubilans, Phlomoides anisochila, Salvia submutica, Seseli turbinatum, Silene paranadena, Tulipa affinis, [Falco cherrug], [****Neophron percnopterus****], [****Malus sieversii****]*
UZB 25	Koytash Ridge	18,000	B1	+									*Acantholimon nuratavicum, Anura pallidivirens, Astragalus kelleri, Astragalus knorringianus, Cousinia dshisakensis, Erysimum nuratense, Helichrysum nuratavicum, Seseli turbinatum, Tulipa affinis*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
UZB 26	Aktau Ridge	36,000	B1	+							Y		*Allium eremoprasum, Allium isakulii, Allium praemixtum, Anura pallidivirens, Astragalus kelleri, Astragalus nuratensis, Cicer grande, Cousinia pseudolanata, Ferula nuratavica, Helichrysum nuratavicum, Nanophyton saxatile, Parrya sarawschanica, Salsola titovii, Vicoa krascheninnikovii*
UZB 27	Kattakurgan Reservoir	13,000	D1			+						Y	*Anthropoides virgo*
UZB 28	Western Zeravshan	115,000	B1	+									*Astragalus chrysomallus, Astragalus stipulosus,* ***Amygdalus bucharica****, Cerastium borisii, Cousinia adenophora, Cousinia butkovii, Cousinia dshisakensis, Dianthus uzbekistanicus, Ferula sumbul, Hedysarum amankutanicum, Jurinea asperifolia, Komarovia angiosperma, Lepidium minor, Oenanthe heterococca, Oxytropis lipskyi, Parrya olgae, Salsola titovii, Serratula lancifolia, Silene oreina, Silene popovii, Tulipa fosteriana, Tulipa ingens, [****Malus sieversii****]*
UZB 29	Chimkurgan Reservoir	4,000	D1			+						Y	*Anser anser, Tadorna ferruginea*
UZB 30	**Talimarjan Reservoir**	**78,000**	A1, D1			+						Y	*Anser anser,* ***Vanellus gregarius***

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
UZB 31	Western Hissar	500,000	A1, B1	+	+						Y	Y	***Panthera uncia**, Acantholimon annae, Acantholimon gontscharovii, Acantholimon hissaricum, Acantholimon taschkurganicum, Acantholimon vvedenskyi, Allium brevidentiforme, Allium dolichomischum, Allium hexaceras, Allium majus, Allium tytthanthum, **Amygdalus bucharica**, Astomaea galiocarpa, Astragalus bobrovii, Astragalus butkovii, Astragalus komarovii, Astragalus massagetowii, Astragalus pseudanthylloides, Astragalus schutensis, Astragalus stipulosus, Astragalus terrae-rubrae, Astragalus tupalangi, Bergenia hissarica, Cephalopodum hissaricum, Cicer incanum, Cousinia allolepis, Cousinia campyloraphis, Cousinia subcandicans, Cousinia vvedenskyi, Dianthus uzbekistanicus, Dimorphosciadium gayoides, Dionysia hissarica, Dracocephalum formosum, Eremurus aitchisonii, Eremurus iae, Eremurus pubescens, Erysimum nabijevii, Euphorbia kudrjaschevii, Ferula fedtschenkoana, Ferula pratovii, Ferula sumbul, Hedysarum bucharicum, Hedysarum kudrjaschevii, Hedysarum magnificum, Iskandera hissarica, Jurinea asperifolia, Jurinea pjataevae, Jurinea sangardensis, Lepidium minor, Ostrowskia magnifica, Oxytropis lasiocarpa, Oxytropis microcarpa, Oxytropis tyttantha, Parrya pjataevae, Pedicularis grandis, Rhus coriaria, **Ribes malvifolium**, Saponaria gypsacea, Scutellaria guttata, Scutellaria holosericea, Scutellaria villosissima, Seseli merkulowiczii, Silene michelsonii, Sphaerosciadium denaense, Tanacetopsis botschantzevii, Thesium ramosissimum, Tulipa carinata, Tulipa ingens, Tulipa lanata, Tulipa orythioides, Tulipa tubergeniana, Ungernia victoris, Vvedenskia pinnatifolia, Zeravschania regeliana, Xylanthemum rupestre, [Falco cherrug], [**Neophron percnopterus**], [**Malus sieversii**]*
UZB 32	Tarkapchigay River Basin	70,000	B1	+									*Allium botschantzevii, Allium ophiophyllum, Crambe gordjaginii, Eremurus suworowii, Eversmannia botschantzevii, Hedysarum bucharicum, Hedysarum magnificum, Heliotropium bucharicum, Jurinea gracilis, Phlomoides gypsacea, Salsola lipschitzii, Salvia lilacinocaerulea, Scutellaria colpodea, Spirostegia bucharica, Tulipa uzbekistanica*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
UZB 33	Kugitang and Baysuntay Ridges	180,000	B1	+					+		Y		*Glyptosternum reticulatum, Acantholimon butkovii, Acantholimon majewianum, Allium decoratum, Allium dolichomischum, Allium giganteum, Allium tytthanthum,* ***Amygdalus bucharica****, Astragalus bobrovii, Astragalus bucharicus, Astragalus juniperetorum, Astragalus plumbeus, Astragalus pseudanthylloides, Astragalus rotundus, Astragalus subschachimardanus, Astragalus terrae-rubrae, Astragalus willisii, Calispepla aegacanthoides, Calophaca reticulata, Cicer grande, Cleome tomentella, Cousinia glabriseta, Cousinia glaphyrocephala, Cousinia gnezdilloi, Cousinia haplophilla, Cousinia leptocladoides, Cousinia platystegia, Cousinia rhodantha, Cousinia vvedenskyi, Dionysia hissarica, Dracocephalum formosum, Eremurus aitchisonii, Eremurus alberti, Eremurus baissunensis, Eremurus iae, Eremurus pubescens, Eremurus suworowii, Euphorbia densiuscula, Ferula tuberifera, Halothamnus schurobi, Hedysarum bucharicum, Hedysarum magnificum, Heliotropium bucharicum, Jurinea gracilis, Jurinea sangardensis, Lepidium minor, Lepidolopha fedtschenkoana, Otostegia bucharica, Oxytropis megalorrhyncha, Oxytropis pseudoleptophysa, Oxytropis tyttantha, Oxytropis vvedenskyi,* ***Pyrus korshinskyi****,* ***Ribes malvifolium****, Salvia lilacinocaerulea, Scutellaria colpodea, Scutellaria fedtschenkoi, Seseli nevskii, Silene nataliae, Spirostegia bucharica, Tulipa carinata, Tulipa ingens, Tulipa lanata, Tulipa orythioides, Tulipa tubergeniana, Xylanthemum rupestre, [****Neophron percnopterus****], [****Malus sieversii****], [****Ovis orientalis****]*
UZB 34	Kelif-Sherabad Range	95,000	B1	+								Y	*Allium giganteum, Allium margaritiferum, Allium ophiophyllum, Allium rhodanthum, Astragalus alexeji, Astragalus rubrigalli, Chesneya tribuloides, Cleome gordjaginii, Cleome tomentella, Cousinia platystegia, Eremurus alberti, Eremurus baissunensis, Euphorbia densiuscula, Hammada eriantha, Heliotropium bucharicum, Phlomoides baburii, Plocama botschantzevii, Spirostegia bucharica, Tulipa tubergeniana, Zygophyllum bucharicum*
UZB 35	Khaudaktau	44,000	B1	+									*Allium ophiophyllum, Allium rhodanthum, Climacoptera oxyphylla, Dipcadi turkestanicum, Euphorbia triodonta*

Code	KBA name	Hectares	Global KBA criteria met	Plants	Mammals	Birds	Reptiles	Insects	Fish	Amphibians	Protected area overlap	IBA overlap	KBA trigger species
UZB 36	Uzbek Babatag	98,000	B1	+									*Allium giganteum, Allium gypsodictyum, Allium margaritiferum, Allium sulphureum,* ***Amygdalus bucharica****, Astragalus bucharicus, Astragalus pseudoeremophysa, Astragalus pseudorhacodes, Cousinia candicans, Cousinia stricta, Echinops babatagensis, Echinops brevipenicillatus, Eremurus alberti, Halothamnus babatagi, Lagochilus botschantzevii, Oxytropis babatagi, Reaumuria babataghi, Salvia insignis, Scutellaria colpodea, Tulipa lanata, Tulipa tubergeniana, [****Neophron percnopterus****], [Panthera pardus]*

Notes on Column 2 (KBA name): bold denotes priority sites for CEPF investment.
Notes on Column 14 (KBA trigger species): bold denotes priority species for CEPF investment; underlining denotes other (non-priority) species outcomes; brackets denote globally threatened species that are not confirmed to meet the threshold for any global KBA criterion.

Appendix 5. Corridor outcomes

Code	Conservation corridor name	Area (km^2)	No. of KBAs	Countries
1	Kelif-Talimarjan-Termez wetlands	6,800	3	TKM, UZB
2	Upper Amudarya and Panj River	1,600	2	UZB, AFG, TJK
3	Babatag and Karatau Mountains	6,800	6	UZB, TJK
4	Koytendag and Hissar Mountains	28,800	11	TKM, UZB, TJK
5	Central Tajikistan	15,300	7	TJK
6	Upper Zeravhan River Basin	4,800	1	TJK, UZB
7	**Turkestan and Alai Mountains**	**24,300**	**5**	**KYR, TJK, UZB**
8	Aidarkul Lake and Nuratau Mountains	17,000	6	UZB
9	**Western Tien Shan**	**35,300**	**22**	**KAZ, UZB, KYR, TJK**
10	Kazakh Karatau Mountains	12,700	6	KAZ
11	Upper Talas River Basin	5,400	1	KYR, KAZ
12	Kyrgyz Mountains	12,100	2	KYR, KAZ
13	Ferghana Valley Periphery (including KBAs inside the Ferghana Valley)	17,600	8	UZB, TJK, KYR
14	Ferghana Mountains	14,200	7	KYR
15	**Pamir-Alai and Wakhan Mountains**	**123,500**	**10**	**KYR, TJK, AFG, CHI**
16	Central Tien Shan	33,700	4	KYR, CHI
17	Issyk-Kul Lake Basin	20,500	3	KYR
18	**Khan-Tengri and Tomur Mountains**	**24,900**	**4**	**KYR, KAZ, CHI**
19	Chu Ili Divide	7,200	0	KAZ, KYR
20	Middle Ili River Basin	38,800	8	KAZ
21	Upper Ili River Basin	48,500	6	CHI
22	**Dzungaria**	**29,500**	**4**	**KAZ, CHI**
23	Bayanbuluke and Kaidu River Basin	23,200	1	CHI
24	Bogdashan Mountains	11,100	2	CHI
25	Barkolshan Mountains	13,200	1	CHI

Note: bold denotes priority corridors for CEPF investment.