OTHER

Biodiversity Conservation in Central Asia: On the Example of Turkmenistan

By E. Rustamov and A. Rustamov. 2007 Nagao Natural Environmental Foundation, Shitaya, Taito-ku, Tokyo, Japan http://www.nagaofoundation.or.jp/index_e.php

This nice book of 204 pages offers us an overview of biodiversity, habitat and conservation for a region that either is hardly known or widely ignored: Turkmenistan in Central Asia. This publication carries no ISBN number, but the three sections (Introduction, The Animals Values and Functions in Nature and Human's Life, Strictly Protected Areas in Turkmenistan) consist of 22 chapters with great and authoritive information. Naturalists with an interest in global biodiversity, desert and mountain ecology, Caspian Sea and Central Asia will have a feast because Turkmenistan covers a wide variety of over 20,000 species, consisting of 718 vertebrate species (half of them are birds; and 110 are mammals), including many reptiles as well as over 8,000 insects. Species of the high-altitude belt (1500m till 2900m) are also described. The twelve page bibliography of Turkmenistan, Russian, and English references will get appreciated by the western audience (precious literature comes from the 1930s, 1950s and 1980s). The fascinating photo section of over 60 pages must be emphasized; it greatly achieves in the promotion of Turkmenistan and its protected areas, its biodiversity and habitats. Maps and an ecological desert food web scheme are also presented. The eight state reserves are presented in detail (History; Location, Relief, Climate; Vegetation; Fauna, Fishes, Amphibians and Reptiles; Mammals; Birds; Resume): Repetek, Khazar, Badkhyz, Kopetdag, Syunt-Khasardag, Kaplankyr, Amu-Dariya, and Koitendag. All of these 'strictly' protected areas are either widely known in Asia and beyond, or carry very peculiar habitat and biodiversity features. But taken together, they only cover 1.6% of the nation, and therefore the additional 24 temporarily protected areas are also mentioned. Already the Badkhyz state reserve is a world heritage site, and has a long science tradition (e.g., with investigators such as I. A. Linchevsky, V. I. Lipsky, A. G. Bannikov, G. P. Dementiev). This reserve alone holds 50% of Turkmenistan's red data book species. The author shows us that the birds of the Kopetdag are well studied and described, and that Khazan was set up in the 1930s for the protection of wintering birds in the Caspian Sea region. The Amudar'ya state reserve was especially established for the bukhar deer and the tugai forest vegetation (which is characterized by two popular species and over 25 other plant species). Turkmenistan's famous black and white saxaul forests are mentioned in detail, and so are the Piedmont and Turan Plains, and the Karyluk Caves. Archeologists probably also want to check out Koitendag's Plateau of Dinosaurs (famous for its fossilized footprints and artefacts). Ancient plant imprints such as giant grass Aundo, Sevoika and tree ferns can be found also. Turkmenistan's Jujube Grove of Koitendag is the largest one in Central Asia. Other fascinating landscape features described by the author are for instance the Eroilanduz Depression and the Barkhans (Sand sea).

The author makes clear that UNDP and The World Bank shaped much of the modern conservation landscape in Turkmenistan. Turkmenistan is an IUCN member, holding the 1978 meeting XIV General Assembly in Ashgabat. Turkmenistan also joined six summits to address the Aral Sea problem (together with Kazakhstan, Uzbekistan, Tajikistan and Kyrgyzstan). Further, this country ratified the Convention on Biological Diversity, and later signed agreements in support of the Frame Convention on Climate Change, the Vienna Convention and the Montreal Protocol (re. Ozon), and agreements on the protection of the Caspian Sea environment and others. But the authors make clear that Turkmenisan has not yet signed CITES, nor even Ramsar and the Bonn Convention on Migratory Species (CMS).

The author divides the nature protection history of Turkmenistan into three periods: Initial protection of individual natural objects and territories, first attempts at a complex approach to the protection of natural resources and creation of legal basis (the Role of USSR was particularly strong in 1970s and 1980s), and the period from the 1980s until now (which gets characterized by the author as a series of dramatic and fatal anthropogenic impacts, and with a deleterious effect on the country's economy and human health).

If species disappear from Turkmenistan they are usually gone in central Asia also. To avoid this situation, the creation of a red data book was made possible by the Turkmen Society for Nature Conservation, Ministry of Forestry, Academy of Sciences of Turkmenistan, National Institute of Deserts, Fauna and Flora of Turkmenistan, and the Turkmensitan Ministry of Nature Protection . The first edition was published 1985 and the current second 1999 edition of this book consists of 107 species, including 29 new species (23 species got excluded due to extinction or status change). Most of the endangered species in Turkmenistan are reptiles, and many avian red data species are eagles. It becomes quickly clear though that this red data book is a huge underestimate and does not halt the extinction, nor that its really follows a pre-cautionary approach (as the IUCN demands).

Other interesting Central Asian environmental history can be found in this book with the Wild Ass. In 1880 huge populations were being described for this 'donkey' by several naturalists. But the populations got

seriously destroyed afterwards. During 1941-45 it was at the verge of extinction (a path already followed by the Przewalski's Horse in Mongolia). A re-introduction and strong conservation efforts, e.g., in Badkhyz, brought the species back to low population levels. In passing, the authors mention another Central Asian feature of landscape history, the Aral Sea rescue.

This publication is also very helpful in that the Rustamovs provide as many quantitative estimates as possible. They extrapolate that 350 million lizards live in the Karakum desert, and that 100 million Horsfield's terrapin tortoises occur. Further, the prey items of many discussed species are usually mentioned.

The reader learns in this book about Turkmenistan's stunning landscape and habitat features, but also about massive population declines, extinctions and habitat loss. This information reads like a giant biodiversity funeral, and the author leaves us with no doubt that unbalanced economic growth is responsible. An epitaph is in order. The sections on strictly protected areas in Turkmenistan make it clear that they are all but strictly protected, e.g., as can be seen in the extensive economic development that occurred in Kopetdag. Pistachio woods usually can get over 300 years old, but many of these open woodlands got widely destroyed by man. Ploughing, impacts of the Karakum Canal, and problems through cotton plantations further contribute to such problems. The development and use of clay in deserts threatens many snake species. The hyrcanian tiger existed in Turkmenistan till the 1930s, but now is extinct. Due to the vast and ongoing habitat degradation of leopard habitats they are now also found at the verge of extinction. The caracal is almost endangered. Overcutting and overgrazing from the 1920s onwards lead to huge destruction of habitat. Goitred gazelles are in wide decline (from 100,000 individuals down to now less than just 8,000). Saiga antelopes suffered dramatic declines due to traditional (Chinese) medicine demand. The Persian gazelle became very rare in just a few decades. Argali (initially over 8,000 in 1980s) and Bezoar goats (over 6,000) in central Kopetdag are now less than 2,000 animals. Bat populations are dramatically depleted. The Turamian Tiger, Cheetah and Red Deer are already extinct species. The famous Houbara Bustard is rare now in Turkmenistan. Large pheasant declines are also reported and these are due to loss of the tugai vegetation, excessive use of pesticides and illegal hunting. From 300 known black francolins the populations are now down to 50. Of the 25,000 white-tailed eagles known to occur in the 1930s, now only 150 are counted. Shelducks declined from thousands to hundreds. White-headed ducks (40,000 birds were counted in 1937) make now for a rare species in Turkmenistan. The lizard desert monitor (an animal of 1.5 m in size) is also in steep decline (in the mid1980s over 19,000 were counted, but they are now rare). The Badkhyz state reserve holds about 46 species of mammals, but the Caspian Tiger, Cheetah, Bukhar Deer, Bezoar Ibex and Asiatic Ibex were exterminated in historical times.

Intense commercial fishery also occurred in the natural lakes and water reservoirs of this desert country. Over 75% of all fish were caught by the 1970s and 1980s. Overfishing is reported for species like sabrefish, bream, pike perch, aral barbell and asp. Compared to the 1970s, nowadays the catch is eight-times smaller. Noteworthy is that not even the unique Caspian Seal is included in the red data book.

The authors state that the very existence of human society is inseparable from nature; hence, a close connection is found between nature use and protection. But they state that currently, we are running a technological self-destruction. Regardless of the large biodiversity loss, Turkmenistan has a long track record of (sustainable) nature use. Koitendag for instance is home to oil, rubber and gum-bearing, tanning, dyeing, medical and decorative plants. In Turkmenistan, walnut, almond and pistachio species are important for the national nut production. Turkmenistan's fur harvest consisted of up to 90% fox. Nutria farms got started already in the 1930s, and this species escaped and got introduced; a similar situation is found with black musk rats. The common myna penetrated the territory already in the middle of the last century, making for an avian range expansion of a synanthropic species. During WW2 Turkmenistan exported a large amount of marsh frogs; also, a large amount of tortoise meat got canned. Turkmenistan further engages in the harvest and farming of poisonous snakes. The explicit use of poisonous snakes started 50 years ago. Venom-based medicines are used worldwide for the treatment of rheumatism, radulitis and polyarthritis. And thus, snake venom is ranked in Turkmenistan higher than gold. Four venomous snakes occur: Blunt-nosed Viper, Saw-scaled viper, Cobra and Copperhead.

The first Turkmenistan studies that aimed at the establishment of strictly protected areas were carried out in 1922. And thus, this book banks a lot on the great work that was done on Nature Conservation in the 1930s. Dr Laptev's surveys from this period present the global audience with a historic baseline of a wilderness area. Already at that time the acamedician V. I. Vernadetsky found that the rapid human technological developments put a geological pressure to the biosphere. And D. N. Kashkarov also stated in 1930 "*… we must save our productive forces and natural resources from destructive use and extermination. It's a matter of natural importance*". The urgent need for Wild Ass protection was already recognized by M. P. Rozanov in 1937. The authors elaborate on contributions made by famous investigators such as V. A. Paletsky, V. A. Dubyansky and E. A. Klyushkin. V. I. Vernadsky, a prominent philosopher and environmentalist, is reported on several times. The legendary scientist N.

J. Vavilov considered Sumbar Valley as the origin of many of the world's cultivated plants. As many others, S. V. Veisov worked on Turkmenistan's nature for over 40 years. Botanist M. G. Poppov worked most of his life in the juniper woodlands. The publication of 'The Nature of Central Kopetdag' from 1986 makes for a central reference in this book and beyond.

Due to this strong earlier research base, the author can present in depth on many endemic species such as the big and small Amudarya shovelnose fishes, Blind Loach (a newly described species), Black-tailed Toad Agama, Maghor, Corsac Fox**,** Striped Hyena, Wild Boar, Porcupine, Bukhar Argali, Tien Sien Brown Bear, Tolai Hare, hedgehogs, Long-clawed Ground Squirrel, jerboas, Marbled Teal, Purple Swamp Hen, Saxaul Sparrow, shrikes, chats, larks, pipits, flycatchers, wheatears, Saxaul Jay, sandgrouse, Dalmatian and Great White Pelicans, Eurasian Spoonbill, wintering Coot, Golden Eagle, Egyptian Vulture, Black Vulture and over 30 falciformes. Some birds are described that even winter in the desert. Flamingos occur in several smaller colonies in adjacent Kazakhstan, and c. 15,000 individuals are wintering in the Khazar state reserve. Other great presented information deals with wild sugar cane, the licorice plant, black widow spiders, leishmania disease transmitted by great gerbils, and the 10 month hibernation of tortoises in Badkhyz. Seasonal Caspian Sea level change and rise is reported by up to a 1m. We further learn that the *mandragora turcomanica* (Mandrake) plant species is of paramount scientific value, but only 500 (!) plants are left in the Syunt-Khasardag state reserve. The few typos in this book can easily be forgiven.

By now, most mammals retreated into protected or less accessible mountain areas. As a consistent message from this book we learn that Turkmenistan's reserves are way too small (Badkhyz should be enlarged by at least 20%; and IUCN requires to protect at least 10% of any national area). Authors demand that better laws are needed for Turkmenistan, e.g., the Nature Conservation Law from 1991: virtually all of the hunting regulations need improvement; and rare and endangered animals and plants should be entirely protected. The introduction and acclimatization of alien species, e.g., fish, must be stopped (legally and on the ground). The Bolshoy Balkan mountains need to be protected; the cheetah in Badkhyz should be restored, and the Karlyk Caves need efficient protection from tourists. Currently, the nature reserves just have a peculiar marginal distribution, being located at the outer edges of Turkmenistan, and are designed without modern strategic conservation planning. For Sumbar valley, the world's genetic center of cultivated plants, it took four decades til protection. Now, much hope is placed on the UNDP project on "Improvement of the managing system of protected areas in Turkmenistan" (2003-2006). The authors also put hope on the GEF project of sustainable development of the Khazar state reserve for Caspian Sea. Important Bird Areas (IBA/ Birdlife International) and the ECONET project are mentioned as additional beacons of hope.

Taxonomic names of this book are unfortunately not expressed in www.itis.org for globally standardized names, known governmental failures are not presented in depth, climate change is virtually left unmentioned, and the huge and further increasing Chinese and Indian demands on Turkmenistan are hardly discussed. However, this book simply makes for the biodiversity milestone publication for this region and shows how much decline and destruction the globe is currently going through during post-communism. We are unsure what the future will bring exactly, but with an increase in human population, with more Chinese and Indian influence, as well as with climate change on the steep rise it can hardly look good for Turkmenistan, Central Asia and the global ecological services relying on this region.

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