

## **A Checklist of the Amphibians and Reptiles of the Republic of Uzbekistan with a review and summary of species distribution**

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**Abstract:** Taxonomy dependent, four amphibian (three toads and a frog) and 57 reptile species (a tortoise, 36 lizards and 20 snakes) appear confirmed as occurring within the Republic of Uzbekistan. One of these species, Szczerbak's even-fingered gecko *Alsophylax szczerbaki*, has perhaps been extirpated. The presence of a further two taxa, i.e., long-legged bent-toed gecko *Tenuidactylus longipes* and multi-ocellated racerunner *Eremias multiocellata* is unclear (but both probably absent), whilst the standing of Turkestan salamander *Hynobius turkestanicus* remains an enigma. Species distributions in Uzbekistan are summarised based on a literature review supplemented by recent field observations.

**Keywords:** Central Asia, Kyzylkum, amphibian distribution, reptile distribution, herpetofauna, literature review

### **Introduction**

The impetus for compiling the checklist came about in spring 2012 whilst the author was working on a conservation project in the Kyzylkum Desert, Uzbekistan. It became apparent that there was no English language checklist available (or, if in existence, none easily accessible) to the herpetofauna of the Republic of Uzbekistan.

The checklist comprises species whose presence has been confirmed in Uzbekistan via fieldwork conducted over many years (principally by Russian/Central Asian herpetologists, but also others). It includes Szczerbak's even-fingered gecko *Alsophylax szczerbaki*, known very locally in the Amu Darya valley of W Karakalpakstan and possibly Khorezm (adjacent to its main area of distribution along the Amu Darya in NE Turkmenistan), that appears unrecorded in Uzbekistan for over 25 years. The checklist additionally addresses three taxa whose status is uncertain: (i) long-legged bent-toed gecko *Tenuidactylus l. longipes* - known from three, 100-year old specimens from the far south on the Afghan border; (ii) multi-ocellated racerunner *Eremias multiocellata* (or another species in the '*multiocellata* complex') - based on available evidence, probably absent; and (iii) Turkestan salamander *Hynobius turkestanicus* - all specimens lost, collection localities also unknown, possibly montane SE Uzbekistan but more likely SW Kyrgyzstan (if indeed a valid species).

Additional to the checklist, information is collated (via a literature review supplemented by recent field observations) regarding species distributions within Uzbekistan. There is no single, English language publication that synthesises information of herpetofauna distribution in Uzbekistan. During this process it became apparent that the distribution of several species within Uzbekistan remains rather unclear; this lack of information is highlighted within respective species accounts.

The classification of several taxa present in Uzbekistan is variably unresolved (primarily the green toad *Bufo* (*Bufo*) *viridis*, sand boa *Eryx miliaris-tataricus* and racerunner *Eremias velox* complexes, and the agamid genus *Phrynocephalus*), hence subject to ongoing study and accordant revision. Nomenclature in the checklist mostly follows that of two authoritative online databases: (i) *Amphibian Species of the World* (AMNH; research.amnh.org/vz/herpetology/amphibia), and (ii) *The Reptile Database* (TRD; reptile-database.org). For taxa undergoing recent changes in nomenclature, up-to-date revisions are incorporated (thus sometimes deviating from the two aforementioned references). It is acknowledged that for some species/taxa, treatments adopted in the checklist are, inevitably, not universally accepted.

### **Objectives**

- 1) To provide a checklist of the extant herpetofauna of Uzbekistan.
- 2) To summarise distribution of each species/ssp. within the country, with an emphasis on clarifying the distribution of taxa for that which it is currently unclear, and by association, highlight lack of information.
- 3) To appraise the status of taxa that have been indicated or inferred as occurring, but whose presence is uncertain.

### **Methods**

**Literature review:** A herpetological review was undertaken of the more recent (late 1960s onwards), mostly English language literature (including Russian translations), but also that in Russian with English summaries and/or incorporating distribution maps indicating localities where species have been recorded. Original Russian language papers/articles were only specifically sought and consulted in order to clarify distribution/status of a few species if ambiguously described in more recent publications. Sources consulted to collate the checklist comprised three main components:

- 1) Books that synthesise the information concerning species distribution within the region, principally: i) *Guide to the Amphibians and Reptiles of the USSR* (Bannikov et al. 1977; in Russian); ii) *Gecko Fauna of the USSR and Contiguous Regions* (Szczerbak & Golubev 1996; originally published in Russian, 1986); iii) *Guide to the Reptiles of the Eastern Palearctic* (Szczerbak 2003); iv) *The Reptiles of Northern Eurasia: taxonomic diversity, distribution, conservation status* (Ananjeva et al. 2006; originally published in Russian, 2004); v) *The Red Data Book of the Republic of Uzbekistan* (Azimov et al. 2009; in Russian with English summaries); vi) *The Reptiles of the Western Palearctic – annotated checklist and distributional atlas* (in 2 vols: Sindaco & Jeremčenko 2008, Sindaco et al. 2013); and vii) *The Amphibians of the Former Soviet Union, revised 2<sup>nd</sup> edition* (Kuzmin 2013).
- 2) Scientific papers/articles identified via keyword searches of online search engines.
- 3) Online databases, e.g. *Amphibian Species of the World* (research.amnh.org/vz/herpetology/amphibia/), *The Reptile Database* (www.reptile-database.org), *L@certidae Eidechsen Online* (www.lacerta.de) etc.

**Additional observations:** Summaries describing species distributions are supplemented by recent field observations principally made by Thomas E. Martin and the author (DS) in Bukhara, Navoi, Samarkand and Tashkent provinces (2011 to 2015), but also with (acknowledged) contributions by others.

## Checklist contents

**Genus accounts:** Preceding the species accounts, for some genera recent changes in nomenclature relevant to the genus are summarised.

**Species accounts** include:

- 1) **English vernacular name, scientific name and author citation;**
- 2) **Synonyms:** up to three alternatives, primarily those more recent and likely to be encountered in the main literature;
- 3) **Distribution:** for taxa endemic to Central Asia (several with very restricted ranges), and also some others, distribution in adjacent countries is included where this helps to clarify distribution within Uzbekistan;
- 4a) **Distribution in Uzbekistan:** *for species known to occur* – a summary of distribution. Co-ordinates simply given as degrees (e.g. 40°N 63°E), refer to 1° latitude-longitude ‘squares’. Where Bannikov et al. 1977 is cited, maps indicating site localities were inspected (but not the text) and the map number is given in each species account (if referred to) upon first use, e.g. ‘(Bannikov et al. 1977: map 28)’. Other mapped information in other publications i.e. ‘maps’ (Russian: Карта) and/or ‘figures/figs.’ (Рис. or Рис.), are similarly indicated.  
For the purpose of broadly describing distribution within Uzbekistan, five regional terms are used (see: **Species distribution**, below). For names of given localities it should be borne in mind that transliteration of place names from Uzbek/Russian Cyrillic into English vary greatly. A common English alternative is given (in parentheses) if very different from original text.  
Where **altitudinal data** relevant to Uzbekistan (or secondarily Central Asia) is available, this is included. For numerous species however, such data appears lacking, therefore altitudinal limits are estimated (if site localities are known) using ‘Google Earth Pro’.
- 4b) **Distribution and status:** *for three taxa of uncertain status*, denoted [?] – an evaluation of distribution and status (i.e. whether or not present) within Uzbekistan.
- 5) **Red List Category:** (i) the most recent (version 2018-1) *International Union for the Conservation of Nature* (IUCN) *Red List* ‘Extinction risk’ category (www.iucnredlist.org); and (ii) category in the *Red Data Book of the Republic of Uzbekistan 2009* (Azimov et al. 2009) with a brief appraisal of main threats.
- 6) **Subspecies:** specified as ‘Monotypic’ or the number of subspecies (ssp.), with those in Uzbekistan indicated.
- 7) **Remarks:** as required, e.g. clarifying taxonomy, highlighting variations of author citation, habitat notes etc.

**Species distribution:** Administratively, Uzbekistan is divided into Karakalpakstan (a semi-autonomous region, officially the ‘Republic of Karakalpakstan’) that occupies the northwest of the country, 12 provinces (also, in English, referred to as ‘regions’) in Uzbek (transliteration): ‘viloyatlar’, plural; ‘viloyat’, singular; ‘viloyati’ in compound (e.g. ‘Bukhara (Buxoro) viloyati’), and one independent city, ‘Tashkent’ (Toshkent) within Tashkent province (see map, Fig. 1). In the text ‘province’ is mostly only used to clarify as necessary from a city of the same name (i.e. Andijan, Bukhara, Fergana, Jizzakh, Namangan, Navoi, Samarkand and Tashkent). For the purpose of broadly describing distributions, five regional terms are used:

- 1) Karakalpakstan – the northwest of the country (165,600 sq. km, or about 37% of the land area of Uzbekistan). In the west lies the arid, rocky Ustyurt Plateau and the Sarygamysh (Sarykamysh) depression that protrudes into the southern Ustyurt; to the east lies the remnants of the Aral Sea, the Aralkum (a post-1950s, ‘man-made’ desert formed on the recently exposed parts of the dry sea bed), and Amu Darya delta and plain (now mostly cultivated) that extends south into Khorezm province. About 25% of its land area (i.e. most of the SE) lies in the Kyzylkum.

2) Kyzylkum – the Kyzylkum Desert (298,000 km<sup>2</sup>) lies between the two major rivers of Central Asia, the Amu Darya (historically the Oxus; ‘darya’ Persian for river) to the west (approximating to the Uzbekistan-Turkmenistan border along much of its course) and the Syr Darya (Jaxartes) in S Kazakhstan to the east. Both broadly flow northwest to the Aral Sea, although little water now reaches it as most is diverted for irrigation. About two thirds of the desert lies within Uzbekistan and one third in adjacent S Kazakhstan, but at its southern extremity it includes a small area of SE Turkmenistan east of the Amu Darya. Within Uzbekistan, the Kyzylkum (that includes several relict mountain ranges and hills, and freshwater and brackish lakes/wetlands) covers about 190,000 km<sup>2</sup> of the central area of the country, i.e. SE Karakalpakstan, most of Navoi and Bukhara provinces (excluding parts of their south and the Amu Darya valley), SE Khorezm and N Jizzakh, south to the mostly cultivated and fairly densely populated zone along the Zerafshan Darya. The Sundukli Sands (southern extremity of the Kyzylkum) lie mostly within SE Turkmenistan but extend into a small area of extreme S Bukhara province and NW Kashkadarya. If not recorded in the Uzbekistan part, herpetofauna documented within the Sundukli of Turkmenistan (Schammakov et al. 1993) are indicated, as potentially likely to occur.

3) SE Uzbekistan – the non-desert zone (but mostly still quite arid) primarily S/SE of the Kyzylkum and either side of the Zerafshan Darya, comprising SE Bukhara, S Navoi, Samarkand, C-S Jizzakh and Sirdarya provinces. It includes the approximately E-W orientated Nuratau and Turkestan Ugam (Turkestan, Turkestansky) Ranges (north and east of Samarkand city respectively), and the Zerafshan Darya valley.

4) E Uzbekistan – east of the Syr Darya, the four ‘Eastern provinces’ comprising Tashkent, Andijan, Fergana and Namangan. The Fergana Valley (Pherghan Valley, Ferganskaya; Uzbek: Farg'ona vodiysi), a zone of high reptile endemism, spreads across the latter three provinces (separated from Tashkent to the north by the Chatkal Range, a spur of the W Tien Shan) and adjacent N Tajikistan and SW Kyrgyzstan. Note, four small Uzbek enclaves (Chon-Qora, Jani-Ayil, Shakhimarden and Sokh) included in Fergana province, lie within SW Kyrgyzstan.

5) S Uzbekistan – primarily Kashkadarya and Surkhandarya provinces, including the Gissar and Zerafshan Ranges (the latter approximating to the eastern part of the provincial boundary between Samarkand and Kashkadarya) and the Kugitang Mountains that extend into adjacent SE Turkmenistan.



**Figure 1.** Map of Uzbekistan showing the location of Karakalpakstan (including the Ustyurt Plateau and Aralkum Desert) and the 12 provinces, approximate northern and southern limits of the Kyzylkum Desert within Uzbekistan, and major rivers/waterbodies. (Base map courtesy of Wikipedia).

## ANNOTATED CHECKLIST

### AMPHIBIA

#### Family Bufonidae (Typical toads)

**Genus *Bufotes* (Green toads):** The green toad *Bufo viridis* (and other members of the widespread Palearctic green toad species complex) was placed into the resurrected genus *Pseudepidalea* by Frost et al. (2006). However, there was disagreement regarding use of *Pseudepidalea* over *Bufo*, and subsequently Dubois and Bour (2010) proposed three *Bufo* subgenera, that for the *Bufo viridis* complex being *Bufotes* Rafinesque, 1815. Frost, in 2013, raised *Bufotes* to genus rank (see Frost 2018, for discussion) as is followed in the checklist, although *Bufo* is retained by some authorities. The complex comprises 16 species to date (AmphibiaWeb 2018).

Within Uzbekistan three members of the complex are known to occur, *B. pewzowi* (a tetraploid), *B. shaartusiensis* and *B. turanensis* (both diploids, often considered conspecific and validity of separation from *B. viridis* questioned; Kuzmin 2013). Their distributions are rather unclear (sympatric in some areas), primarily due to difficulty (or impossibility) of separation in the field as morphometric characters overlap broadly, the only reliable method of identification being via genetic analysis. Some literature implies presence of *B. variabilis* in Uzbekistan but closest proven localities are on the north shore of the Aral Sea in Kazakhstan (Stöck et al. 2006), although range limits are not precisely known (*variabilis* genotypes have been found in Sweden, Denmark and Germany, and from S Greece, through much of W Asia, east to NW Kazakhstan). Validity of separation of *B. variabilis* from *B. viridis* is also questioned by Kuzmin (2013).

In Uzbekistan *Bufotes* are widespread but of local occurrence on the Ustyurt Plateau and through the Kyzylkum where restricted to localities with suitable waterbodies for breeding. An increase in the range of some green toad populations has been human-facilitated (e.g. via dispersal along canals, colonisation of previously arid areas now under irrigated cultivation, and use of artificial waterbodies for spawning), and they may occur in built-up environments (villages, towns and cities) as well as agricultural landscapes.

- Central Asian green toad *Bufotes pewzowi* (Bedriaga, 1898)

**Synonyms:** *Bufo viridis pewzowi*, *Bufo viridis* var. *pewzowi*.

**Distribution in Uzbekistan:** Primarily montane (Kuzmin 2013) but also in semi-desert, plains and foothills, recorded from 322 to 2,049 m asl (in Tajikistan up to 3,492 m; Litvinchuk et al. 2011). Perhaps occurs at lower elevation, e.g. in Karakyr wetlands but species here uncertain (see below). Widespread in foothills and mountains of SE (e.g. Nuratau Range, 900 to 1,600 m; Stöck et al. 2006), and south through the Zerafshan and Gissar Ranges to the Kugitang Mountains, Surkhandarya (Litvinchuk et al. 2011: Fig. 1). Also widespread in E (Kuzmin 2013), including records through Tashkent and NW Namangan referred to as '*Bufo viridis* complex' (Vashetko et al. 2003; Fig.1) where *B. turanensis* and *shaartusiensis* are unconfirmed. However, it should be noted that there are many records of green toads of unknown ploidy in Uzbekistan (Kuzmin 2013: Fig. 100) south of about 42°N, and it is feasible that both *turanensis* and *shaartusiensis* may occur in the E, if so most likely at lower elevations. Predicted potential geographical distribution (Litvinchuk et al. 2011) suggests that *B. pewzowi* could be widespread in the S Kyzylkum (approximating to Bukhara and S Navoi provinces, north to about the Kuldjuktai Mountains). Within this part of the Kyzylkum, green toads, perhaps *B. pewzowi* (i.e. photos look like polyploid toads, M. Stöck pers. comm. 2012) but unconfirmed, are common around Karakyr Lake and associated wetlands (formed in the 1970s through water seepage from canals and subsequent flooding) at 185-195 m asl (DS pers. obs. 2012-15). Also observed as far north as Shuruk village (southern foothills of the Kuldjuktai), 317 m asl (A. Swash pers. comm. 2015), and east to Zafarabad town, 320 m asl (DS pers. obs. 2012), Bukhara province.

**Red List Category:** Least Concern (IUCN 2018; last assessed 2004).

**Ssp:** *Bufotes* is a species complex.

- Shaartuz green toad *Bufotes shaartusiensis* (Pisanets, Mizhzhherin & Shcherbak, 1996)

**Synonyms:** *Bufo viridis shaartusiensis*, *Bufo turanensis*.

**Distribution:** A southern Central Asian endemic known from Uzbekistan, W Turkmenistan and SW Tajikistan (Litvinchuk et al. 2011). Also stated as in N Afghanistan (Frost 2018) but not on the Afghanistan checklist of Wagner et al. (2016a); within this checklist it is indicated that 'some historical records cannot be assigned with surety' to the four subspecies of the *B. viridis* complex that are included.

**Distribution in Uzbekistan:** Distribution unclear, broadly sympatric with *B. turanensis*; undoubtedly under-recorded due to similarity with *B. turanensis* (with which often considered conspecific; see: Remarks) and *B. pewzowi*. In Uzbekistan, of five widespread confirmed (via DNA analysis) records (Litvinchuk et al. 2011: Fig.1), four are in the W/S in the vicinity of the Amu Darya valley (not known from the Kyzylkum) and one along the Zerafshan Darya, from N to S: (i) Qunghiro (Qo'n'irat, Kungiro; 42°49'N 59°00'E), Karakalpakstan; (ii) Khonqa

(Khanka; 41°29'N 60°46'E), Khorezm; (iii) Jondor (39°45'N 64°12'E) just north of Zerafshan Darya, 18 km WSW of Bukhara city, Bukhara province; (iv) Talimardzhan (38°23'N 65°38'E), Kashkadarya; and (v) Jarqo'rg'on (Djarkurgan; 37°31'N 67°27'E), S Surkhandarya. Known altitudinal limits in Uzbekistan (and currently applicable to entire range) are 53 to 385 m asl (Litvinchuk et al. 2011).

In N Uzbekistan and W Kazakhstan, numerous localities referred to as '*Bufo viridis*' are mapped on the fringes of the Ustyurt and around the shore and on islands of the Aral Sea (Bannikov et al. 1977: map 16, Kuzmin 2013: Fig. 97). It is uncertain as to which taxa these are attributable but those within Uzbekistan, probably mostly *B. turanensis* (see below). However, some may refer to *shaartusiensis* as it has been recorded as far north as Kungirov town (i.e. only about 110 km S of the southern Aral coast).

**Red List Category:** Not yet assessed (IUCN 2018).

**Remarks:** Distinctiveness from *Bufo viridis turanensis* (as then was) thought doubtful (Stöck et al. 2001) and considered a synonym of *Bufo (Bufotes) turanensis* by Papenfuss et al. (2009). *B. shaartusiensis* was subsequently treated as a valid species by some authorities on the basis that it and *B. turanensis* were notably genetically different (Litvinchuk et al. 2011, Stöck et al. 2013). However, Kuzmin (2013) considers *shaartusiensis* a subspecies of *B. viridis* as the level of genetic divergence does not seem sufficient to elevate it to species rank, and further, hybridization indicates compatibility with *B. v. turanensis*. Considered a species by Frost (2018).

Distribution simply described as 'southwestern Tajikistan' (Betto-Colliard et al. 2015) and 'south-western Tajikistan' (Ficetola & Stöck 2016).

**Ssp:** *Bufotes* is a species complex.

- Turan green toad *Bufotes turanensis* (Hemmer, Schmidtler & Böhme, 1978)

**Synonyms:** *Bufo viridis turanensis*, *Bufo viridis* var. *turanensis*.

**Distribution:** Until fairly recently *B. turanensis* appeared endemic to mountains of N Iran and S Turkmenistan, and possibly adjacent N Afghanistan and S Uzbekistan (Papenfuss et al. 2009). Subsequently confirmed in N and S Uzbekistan (Litvinchuk et al. 2011), and N Afghanistan (Wagner et al. 2016a).

**Distribution in Uzbekistan:** Widespread, excluding the Ustyurt Plateau and E. Confirmed (via DNA analysis) localities are spread through lowland Uzbekistan (Litvinchuk et al. 2011: Fig. 1): (i) five scattered sites across the N Kyzylkum (W to E): Dzharakuduk (42°06'N 62°36'E); Mingbulak (42°13'N 62°51'E); Bakhaly (42°40'N 63°23'E), Jamanuru (42°39'N 63°19'E) and Uchkuduk (Uchquduq) (42°07'N 63°31'E), N Navoi province; (ii) Nukus (42°22'N 59°34'E), Karakalpakstan; (iii) Kyzyl-Ravat (39°35'N 63°59'E), approx. 42 km WSW of Bukhara city, Bukhara province; and (iv) Katta-Kum Sands (37°23'N 67°18'E), S Surkhandarya.

Although unconfirmed in E, there are many green toad records of unknown ploidy (Kuzmin 2013: Fig. 100) and *turanensis* has been recorded further east in neighbouring Kyrgyzstan (to just north of Bishkek, 43°18'N 75°00'E; Stöck et al. 2006: appendix A) so perhaps to be expected. Predicted potential geographical distribution suggests that both diploids (i.e. *B. turanensis* and *shaartusiensis*) might occur through much of lowland Uzbekistan, where recorded from 44 to 448 m (Litvinchuk et al. 2011). *B. turanensis* is known from higher altitudes elsewhere, e.g. up to 1,467 m in the Kopet Dag, NE Iran (Stöck et al. 2006).

Numerous records referred to as '*Bufo viridis*' are mapped on the Ustyurt Plateau fringe and around the shore and on islands of the Aral Sea (Bannikov et al. 1977: map 16, Kuzmin 2013: Fig. 97). Within Uzbekistan, these are perhaps mostly attributable to *B. turanensis* (but see *B. shaartusiensis*, above) on the basis of known proximity to the south (Litvinchuk et al. 2011) and that *turanensis* genotypes '*B. cf. turanensis*' have been found further north in C Kazakhstan, (i.e. 48°13'N 67°03'E; Stöck et al. 2006).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2008).

**Ssp:** *Bufotes* is a species complex.



*Bufotes* sp. (cf. *pewzowi*) near Karakyr wetlands, C-N Bukhara province (Photo: Vladimir Terentyev).

## Family Ranidae (Typical frogs)

**Genus *Pelophylax* (Water frogs):** Based on molecular phylogenetic studies and morphological differences, Frost et al. (2006) proposed changing the genus of ‘water frogs’ from *Rana* to the previously erected genus *Pelophylax* Fitzinger, 1843, and this is now widely accepted. *Rana* is retained for the more terrestrial ‘brown frogs’.

- Eurasian marsh frog *Pelophylax ridibundus* (Pallas, 1771)

**Synonyms:** *Pelophylax ridibunda*, *Rana ridibunda*.

**Distribution in Uzbekistan:** Widespread but in north and west mostly confined to the Amu Darya valley. Absent from large areas where permanent freshwater is lacking, i.e. Ustyurt Plateau, Aralkum, Aral Sea coast and most of the Kyzylkum (Bannikov et al. 1977: map 20, Kuzmin 2013: Fig. 121). In Central Asia it is often difficult to distinguish between the periphery of the natural range and areas occupied after dispersal due to human habitat alteration (e.g. uses canals as pathways into arid areas, occupies irrigated areas and its range can change relatively rapidly) and introductions (Kuzmin 2013). In some otherwise arid areas of Uzbekistan, it has dispersed along canals into e.g. (i) the Karshi steppe, Kashkadarya (Salikhbaev et al. 1967 and Vashetko 1981, in Kuzmin 2013) and Karnabchul steppe, S Navoi (Martin et al. 2017); (ii) the C-S Kyzylkum, colonising the ‘man-made’ Karakyr wetlands (arisen through canal leakage and subsequent flooding, in the 1970s), Bukhara province, where now abundant (DS pers. obs. 2012); also in at least some of the 14 or so lakes/reservoirs on the desert periphery 35 to 40 km NW of Bukhara city (DS pers. obs. 2015).

Altitudinal range in Uzbekistan estimated at 50 m (Amu Darya delta, Karakalpakstan) up to 2,000 m asl (i.e. W Tien Shan ‘not found above 2,000 m’; Vashetko et al. 2003).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2008).

**Ssp:** *Pelophylax ridibundus* is the central member of the *P. ridibundus* complex.

**Remarks:** Mitochondrial DNA investigations suggest that some C Asian populations of *P. ridibundus* might represent separate species (Kuzmin et al. 2009). However, no one has apparently yet looked at the DNA of *Pelophylax* in Uzbekistan. The closest localities with genetic investigations (N Caspian area) has produced both *P. ridibundus* and *bedriagae* haplotypes; frogs in S Tajikistan have been described as Terentjev’s frog *Pelophylax terentievi* (Mezhzherin, 1992) and are apparently genetically distinct (P. Crochet pers. comm. 2012). The distribution of *P. terentievi* is unclear but closest confirmed localities to Uzbekistan are near Obi-Garm (type locality) east of Dushanbe city, S Tajikistan (approx. 130 km E of the border with Surkhandarya), and Kunduz, N Afghanistan (Wagner et al. 2016a; approx. 110 km SE of Surkhandarya). Pending further research, all water frogs in Uzbekistan are referred to as *P. ridibundus*.



*Pelophylax ridibundus* Karakyr wetlands, C-N Bukhara province (left), and in canal by Jeyran Ecocenter Reserve, S Bukhara province (Photos: David A. Showler).

## Family Hynobiidae (Asiatic Salamanders)

[?] Turkestan salamander *Hynobius turkestanicus* Nikolsky, 1909

**Distribution and Status:** There is no precise information regarding the distribution of *Hynobius turkestanicus* and the species validity is uncertain (see: Remarks). The collection localities (type series collected 1902), described as ‘between Pamir and Samarkand’ (i.e. Kyrgyzstan, Tajikistan and/or Uzbekistan), are also unknown; subsequently all specimens lost and no records since. Based on habitat preferences of salamanders and the most suitable areas along the expedition route of V.N. Nikolsky (the collector), considered by Kuzmin et al. (2004) as most probably present in humid montane valleys with rivers in SW Kyrgyzstan and/or adjacent S Andijan province, E Uzbekistan (distribution tentatively mapped, IUCN database). Borkin and Litvinchuk (2011) subsequently reassessed the available information including ‘new data’ regards Nikolsky and his 1902 Pamir travels. An outcome of this was a re-evaluation of the possible distribution of *H. turkestanicus*, in part, based on habitat preferences of *Ranodon* and *Paradactylon* salamanders (Hynobiidae). They consider it [translation from Russian] most likely collected in the vicinity of streams/rivers in two sections of forested steppe (of about 11 km

and 20 km in length) along the Alai Ridge and Valley in a small area of montane SW Kyrgyzstan (Borkin & Litvinchuk 2011: Fig. 6) [centred about Maydan village, 40°02'43"N 72°04'46"E, Batken province], within probable altitudinal limits of 1,830 to 3,200 m (altitudinal range of suitable habitat at one site estimated 2,500 to 2,900 m). This area is about 20 km S of the border with Fergana province (Uzbekistan) and less than 15 km E of the small Uzbek enclave of Shakhimarden (i.e. a little west of the postulated mapped range, Kuzmin et al. 2004).

**Red List Category:** Data Deficient (IUCN 2018; last assessed 2004).

**Ssp:** Monotypic.

**Remarks:** Known only from specimens usually attributed as collected by V.N. Nikolsky in 1902, however, there was perhaps more than one collector (Kuzmin 2013). Investigations indicate that seven individuals were obtained, the holotype (a female) collected by V.N. Nikolsky (later described by A.M. Nikolsky). Although all specimens have apparently been lost, based on the holotype description, Kuzmin (2013) suggests that *H. turkestanicus* seems a valid species but highlights that numerous problems (including, clearly, loss of specimens) make this judgement uncertain. Its taxonomic position is also unclear as salamanders of the genus *Hynobius* are unlikely to occur in Turkestan (Poyarkov 2010), all other species (about 30) occurring considerably further east (Russian Far East, E China, Korea and Japan).

The year of publication of species description is given as 1910, i.e. 'Nikolsky, 1910' by Borkin and Litvinchuk (2011). This is perhaps attributable to the 'original publication' (dated 1910) having 'reprints' printed in 1909, and dated as such; 'there are reasons to suppose that they had been printed and distributed early' (Kuzmin 2013).

## REPTILIA

### Family Testudinidae (Tortoises)

- Central Asian tortoise *Testudo horsfieldii* Gray, 1844

**Synonyms:** Sometimes assigned to the monospecific genus *Agrionemys* but *Agrionemys* is usually ranked as a subgenus of *Testudo*: *Agrionemys horsfieldi*, *Agrionemys horsfieldii*.

**Distribution in Uzbekistan:** Widespread. Scarce on the Ustyurt Plateau (Karakalpakstan) but recorded around its periphery (Bannikov et al. 1977: map 28, Fritz et al 2009, Nuridjanov et al. 2016: Fig. 1), and in S Ustyurt documented in the Shakhpakhty area, Assake-Audan depression and Sarygamysh depression (Murzakhanov 2012). Very local in the N Kyzylkum where recorded in the Bukantau hills/Uchkuduk area (Bannikov et al. 1977, Nuridjanov et al. 2016) to about 50 km east of Uchkuduk (Martin et al. 2017), N Navoi province. Further south mapped in the Zarafshan area, C Navoi (Bannikov et al. 1977), and widespread in semi-desert of the C Kyzylkum through N-C Bukhara (40°N 62-64°E; DS pers. obs. 2012-15) and S Navoi (Fritz et al. 2009; Martin et al. 2017). There appear no records from the Sundukli Sands within Uzbekistan but documented in adjacent Turkmenistan (Schammakov et al. 1993). Widespread in S, SE and E but distribution has become fragmented and localised, and some populations much reduced (or extirpated), this attributed to habitat loss and collection (see: Remarks).

Occurs from an estimated 45 m asl (Aral Sea coast), up to 1,150 m in mountains (Nuridjanov et al. 2016).

**Red List Category:** Vulnerable (IUCN 2018; last assessed TFT Specialist Group 1996).

**Ssp:** 6 (taxonomy not fully resolved). In Uzbekistan *T. h. kazachstanica* occurs through most of the country and *T. h. horsfieldii* in S Surkhandarya. Another 'clade' appears restricted to the Fergana Valley and tortoises corresponding to *T. h. rustamovi* (distribution usually considered SW Turkmenistan, N Iran and SW Kazakhstan) have been recorded from the Ustyurt (Fritz et al. 2009).

**Remarks:** An assessment of conservation status in Uzbekistan (Nuridjanov et al. 2016) concludes that habitat loss (e.g. due to agricultural development) and long-term collection for the pet trade, has led to reduced numbers and extirpation in some areas, and that current collection levels are unsustainable. Hence it is proposed that *T. horsfieldii* be added to the *Red Data Book of the Republic of Uzbekistan*, thus receiving a level of legal protection.



*Testudo horsfieldii* C-N Bukhara province (Photo: David A. Showler).

## Suborder Sauria (Lizards)

### Family Gekkonidae (Typical geckos)

- Smooth even-fingered gecko *Alsophylax laevis* Nilosky, 1907

**Synonyms:** *Alsophylax kashkarovi*, *Alsophylax pipiens*.

**Distribution:** Endemic to Uzbekistan and S/SW Turkmenistan.

**Distribution in Uzbekistan:** Very local in the N and C Kyzylkum, and S Surkhandarya. In the Kyzylkum there appear only six documented localities, three in N Bukhara province (W to E): ‘Shuruk settlement [40°41’ 63°47E]’ on the southern train [periphery] of the Kuldjuktai Mountains [Mountains]’; ‘30 km W of Ayakagytmā’; and ‘Ayakagytmā’ [village located at 40°40’ 64°29E]’ (Szczerbak & Golubev 1996); and three in Navoi province (N to S): Buzaubay IBA (41°46’N 62°39’E; BirdLife 2018a); ‘Mynbulak Hollow’ [Mingbulak depression takyr; recorded prior to 1976, perhaps now extirpated], and ‘Karakatta Hollow’ [36 km N of Ayakagytmā; approx. 41°00’ 64°29E]’ (Szczerbak & Golubev 1996). Much further south, recorded at one locality in S Surkhandarya, ‘Karasu [a stream] around Termez’ (Szczerbak & Golubev 1996: Fig. 30 [mapped just E of the Surkhan Darya river, at very approximately 37°21’N 67°27’E, about 15 km NE of Termez city]).

Areas inhabited by *A. laevis* (takyr in the sand desert zone) are said to be at elevations between 200-250 m asl (Szczerbak & Golubev 1996). However, altitudinal limits are probably a little broader as Ayakagytmā village lies at 170 m [takyr habitat in vicinity estimated at from 152 to 190 m; DS pers. obs. 2013], terrain around Termez lies at its lowest at about 290 m, and Shuruk village is situated at approx. 315-320 m asl (but perhaps potentially suitable habitat near Shuruk, falls within 200-250 m).

**Red List Category:** Critically Endangered (IUCN 2018; last assessed 2008). Vulnerable, RDB of Uzbekistan (Azimov et al. 2009); extirpated from many former known areas and in others sharply declining, this attributed to habitat loss due to irrigation projects and agricultural encroachment, ploughing of desert takyr considered particularly damaging.

**Ssp:** Monotypic.

**Remarks:** Year of holotype description sometimes given as 1905.

- Strauch’s even-fingered gecko *Alsophylax loricatus* Strauch, 1887

**Distribution:** Endemic to the Fergana Valley of E Uzbekistan and N Tajikistan. Suggested as perhaps also present in adjacent SW Kyrgyzstan (Sindaco & Jeremčenko 2008) where reported from Naukat (Nookat) region to the southeast of Fergana province (Yadgarov 1981 in Szczerbak & Golubev 1996); not indicated as in Kyrgyzstan by Nazarov et al. (2016).

**Distribution in Uzbekistan:** Known from six sites in W Fergana province: five to the west and south of Kokand city, as well as the vicinity of Kokand itself (Nazarov et al. 2016: Fig. 2). Previously also at a locality described as ‘watershed of Angren and Syr-Darja Rivers’ [border of Sirdarya/Tashkent provinces] northeast of Gulistan city (Szczerbak & Golubev 1996: Fig. 30) where current status uncertain and perhaps extirpated (i.e. not mapped as present here by Nazarov et al. 2016).

Altitudinal limits unclear, described as: ‘within 200-400 m elevation’ (Szczerbak & Golubev 1996) and ‘found between 200 and perhaps 600 m asl’ (Nazarov & Sattarov 2017). Recorded (and photographed by R.A. Nazarov in Sindaco & Jeremčenko 2008) in Sariqurgan (Sariqurgon) village [40°20’N 71°01’E], SW Fergana province, at 668 m asl (Nazarov et al. 2016).

**Red List Category:** Vulnerable (IUCN 2018; last assessed 2016). Endangered, RDB of Uzbekistan (Azimov et al. 2009); considered extirpated from natural habitats, persisting only in the vicinity of ancient oases, including ruins of adobe [mud brick] construction and along old canal banks.

**Ssp:** Monotypic. Note, *A. szczerbaki* originally described as a subspecies of *loricatus* (i.e. *A. l. szczerbaki*) is now generally recognised as a species, as treated in the present checklist (see: *Alsophylax szczerbaki* account, below).

**Remarks:** *A. loricatus* (likewise *A. szczerbaki*) appears now to be exclusively synanthropic (a relic of saline clay takyr, now almost entirely lost to agriculture and buildings) with all contemporary observations ‘from ancient oases’ (Szczerbak & Golubev 1996), in the present day comprising mostly built-up and agricultural areas. Usually associated with old man-made constructions, e.g. inhabits gaps between loess bricks of ruins and cracks in duvals (i.e. clay-brick walls around houses). Known sites are all in close proximity to remnant areas of takyr characterized by shrubby plants (e.g. camelthorn *Alhagi maurorum*, *Lycium* sp. [*barbarum*], saltwort *Salsola* sp. and tamarisk *Tamarix* sp.). As well as ruins, observed by T. Sattarov [= Sattarov] in residential buildings in Kanibadam town [Konibodom; approx. 40°18’N 70°26’E], N Tajikistan, about 7 km SW of the border with Fergana province. At its few known localities, as long ago as the 1980s considered threatened by loss and unsympathetic renovation of historic buildings, and old earthen buildings being replaced by modern brick and concrete constructions, as well as loss of remnant semi-natural habitat to agriculture (Szczerbak & Golubev 1996).



- Caspian even-fingered gecko *Alsophylax pipiens* (Pallas, 1811)

**Synonyms:** *Alsophylax microtis*.

**Distribution:** Widespread through Central Asia east to NW China and S Mongolia.

**Distribution in Uzbekistan:** Most localities are from C Kungirost (Qo'n'irat) district (W Karakalpakstan) on the C-S Ustyurt Plateau (e.g. Jaslyk, Kirk-kiz, Sor-Barsakelmes and hills near Lake Sudochoye; Szczerbak & Golubev 1996: Fig. 27), also in the Sarygamysh depression (Murzakhanov 2012) in S Ustyurt. Just south of the Uzbekistan border in Turkmenistan, recorded on Kipillar-kir spit (NW periphery of Lake Sarygamysh) and said to be common around the lake (Fet & Atamuradov 1994). Local in the N (recorded within 43°N 63°E) and C Kyzylkum (41°N 63°E; Sindaco & Jeremčenko 2008), south to the Tamditau area [approx. 41°12'N 64°50'E] southeast of Zarafshan city (Bannikov et al. 1977: map 36), Navoi province. Not indicated as occurring this far south (or indeed within the Kyzylkum) by Szczerbak and Golubev (1996), thus the southern limits of distribution appear unclear.

Altitudinal range in Uzbekistan uncertain. In the 'Middle Asia and Kazakhstan' part of range recorded 'up to 150-350 m asl', further east in NW China/Mongolia, up to 1,550 m (Szczerbak & Golubev 1996).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.

**Remarks:** Habitat described [paraphrased] as slopes of slight elevation covered in small to large disintegrating rock slabs in semi-desert, less frequently on clay-gravel plains, characterised by sparse grass cover and dwarf xerophytic shrubs (Szczerbak & Golubev 1996). An inconspicuous species, in Uzbekistan perhaps under-recorded with undiscovered localities potentially in hills of the N and C Kyzylkum.



*Alsophylax pipiens* Ustyurt Northern Chink (Photo: Mark Pestov).

- Szczerbak's even-fingered gecko *Alsophylax szczerbaki* Golubev & Sattarov, 1979

**Synonyms:** *Alsophylax loricatus szczerbaki*.

**Distribution:** A restricted-range endemic known from a few localities in NE Turkmenistan (Ananjeva et al. 2006), and adjacent Uzbekistan in W Karakalpakstan (Szczerbak 2003) and possibly Khorezm.

**Distribution in Uzbekistan:** Very local in the Amy Darya valley of 'western Karakalpakstan' [=Karakalpakstan] Szczerbak (2003). 'Hiva town' is a named and mapped locality (Szczerbak & Golubev 1996: Fig. 30), and although this map indicates Hiva as on the Turkmenistan side of the border, this might in fact correspond to Khiva city in adjacent Khorezm province (Uzbekistan). *A. szczerbaki* may also occur further southeast in SE Khorezm (see below). There is no data regarding population status in Uzbekistan where known only from a small number of specimens (Nazarov & Shestapol 2017a), and surveys in the Uzbekistan part of its range between 2002 and 2015 failed to find any (R. Nazarov unpubl. data in Nazarov & Shestapol 2017a).

As accounts in the literature concerning the distribution of *A. szczerbaki* are somewhat at odds, i.e. broadly described as the Amu Darya valley of NE Turkmenistan, or the Amu Darya valley NE Turkmenistan and adjacent Uzbekistan, descriptions from several publications are summarised.

(1) Szczerbak and Golubev (1996) describe distribution as the 'left bank of the Amu-Darja River in NE Turkmenia [=Turkmenistan] {also found on the right bank of this river; Golubev & Streltsov 1989, Golubev 1990}' (note the 'braces' {} simply indicate a substantive deviation from the original 1986 Russian text) and seven named localities are mapped. In their short article (cited in Szczerbak & Golubev 1996), Golubev and Streltsov, 1989, [translated from Russian courtesy of V. Terentyev] describe localities in Turkmenistan and their failed attempt to find this gecko in Karakalpakstan (Uzbekistan), and discuss potential presence on a line between Bukhara and Chardzhou (Türkmenabat city); in ancient times there was a caravan route between these two localities. The second cited reference, Golubev (1990), could not be located. Localities (Szczerbak & Golubev 1996) are mostly in Turkmenistan along the Amu Darya (from Kunya-Urgench, [approx. 70-85 m asl] in the north (where said to be historically numerous), southeast to Darghanata settlement [40°28'N 62°12'E approx. 150 m asl.]). However (as indicated above) one locality, 'Hiva town' (mapped as in Turkmenistan), may refer to Khiva city in Khorezm.

(2) Szczerbak (2003) describes distribution as ‘in the valley of Amu-Darja (eastern Turkmenistan and western Karakalpakstan [=Karakalpakstan])’.

(3) Ananjeva et al. (2006) state that *A. loricatus szczerbaki* [=*A. szczerbaki*] only occurs in north eastern Turkmenistan, at ‘Kabakly, Dargana, Gorelde, Takhta and Kunya-Urgench’ on the left bank of the Amu Darya, and ‘El’dzhik’ and ‘Koshkala’ on the right bank. It is unknown why presence in Karakalpakstan is disregarded by Ananjeva et al., who cite Szczerbak (2003) in their bibliography.

(4) Sindaco and Jeremčenko (2008) simply describe distribution as ‘Turkmenistan (left bank of the lower Amu-Darja)’.

(5) Nazarov and Shestapol (2017a) in their IUCN summary, describe distribution as ‘confined to the banks of the Amu Darya River in northeastern Turkmenistan (Ščerbak et al. 1996, Sindaco & Jeremčenko 2008) and southern Uzbekistan’. Within Uzbekistan, mapped distribution (IUCN database) indicates presence in SE Khorezm south to 40°32’N (part-coinciding with Tuyamuyun Reservoir, part of a hydro complex constructed 1969-1983). However, this is not really ‘southern Uzbekistan’ thus a bit misleading, but equally as Uzbekistan follows a NW-SE axis, difficult to describe.

Distribution is mapped as far south as 40°N by Sindaco and Jeremčenko 2008 (map 20), although one locality, ‘El’dzhik’ [approx. 170-230 m asl] in Turkmenistan (Ananjeva et al. 2006), lies a little further south at 39°25’N 62°59’E (80 km northwest of Türkmenabat).

A lowland species but altitudinal limits unclear. Nazarov and Shestapol (2017a) suggest between 200-400 m, i.e. ‘Ščerbak [=Szczerbak] & Golubev (1996) referring to both this taxon and *A. loricatus*, report an elevational range of 200-400 m; this is thought also to be correct for *A. szczerbaki sensu stricto*’. In fact, terrain around sites reported for *A. szczerbaki* appears to lie at about 100 to 250 m asl (although precise localities are uncertain).

**Red List Category:** Vulnerable (IUCN 2018; last assessed 2016). Not in the RDB of Uzbekistan but there are plans to include it (Nazarov & Shestapol 2017a).

**Ssp:** Monotypic.

**Remarks:** *A. loricatus szczerbaki*, only described in 1979 (holotype collected 1976), was raised to species rank in 1999 (Jeremčenko & Panilov 1999 in Sindaco & Jeremčenko 2008), although referred to as a subspecies by some authorities. Bauer et al. (2013) recognise *A. szczerbaki* as a species, as followed in the present checklist.

*A. szczerbaki* is considered a relic of former saline takyr habitat that existed along the Amu Darya valley (lost mostly to agriculture) and now appears exclusively synanthropic. Although areas where it persists (primarily ancient buildings/ruins) are in close proximity to saline clay desert, numerous searches within ‘natural biotopes’ [habitat associated with a particular ecological community] failed to record any (Szczerbak & Golubev 1996). As well as old buildings, in E Turkmenistan it has been recorded along a section of saline clay bank of an old ‘aryk’ [a small aqueduct supplying water for irrigation] between cotton fields (Shammakov 1974 in Szczerbak & Golubev 1996), near Dargan-Ata village [= Darghanata settlement].

- Comb-toed gecko *Crossobamon eversmanni* (Wiegmann, 1834)

**Synonyms:** *Gymnodactylus eversmanni*.

**Distribution in Uzbekistan:** Mainly Karakalpakstan, south to Surkhandarya. Widespread in sandy desert/semi-desert in the Amu Darya delta and around the S and E Aral Sea coast (Karakalpakstan), also Khiva (Khorezm) area, with a few scattered localities in the N Kyzylkum (Bannikov 1977: map 32, Szczerbak & Golubev 1996: Fig. 18). Common in dwarf shrub semi-desert through N and C Bukhara province (40°N 62-64°E, 184-225 m asl; DS pers. obs. 2012-15) in the C Kyzylkum. Just north of the Sundukli Sands there are records from ‘Bukhara; Kagan; Kyzyl-kuduk’ [S of Bukhara city, approx. 39°40’N 64°36’E] and ‘Uchkum Sands to W of Kagan’ (Szczerbak & Golubev 1996). No records were located regarding presence on the Sundukli Sands of Uzbekistan but recorded in adjacent Turkmenistan (Schammakov et al. 1993). There are single isolated sites in the SE, i.e. ‘Samarkand’ [approx. 39°39’N 66°58’E], and E, i.e. sands of the Fergana Valley ‘18 km NW [of] Kokand’ [satellite imagery suggests that this locality at approx. 40°38’N 70°45’E, may have been lost to agriculture], W Fergana province. Also in S Surkhandarya, ‘sands near Djarkurghan village’ [approx. 37°31’N 67°27’E] and ‘15 km N of Termez’ [approx. 37°23’N 67°18’E] (Szczerbak & Golubev 1996).

No altitudinal data located. Localities in Uzbekistan are estimated at almost all between 50-325 m asl; that in the Fergana Valley lies at about 370 m. No further information could be found regards the location described simply as ‘Samarkand’ (Szczerbak & Golubev 1996; specimen(s) in Zoo. Inst., Leningrad) and mapped approximating to the city (Fig. 18); perhaps a sandy valley, but even so seemingly at considerably higher elevation than other locations, the lowest-lying areas within a 20 km radius of Samarkand city being approx. 600 m asl.

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 2: nominate in Uzbekistan.

**Remarks:** Not documented from Sarygamysh depression within Uzbekistan (e.g. Murzakhanov 2012) but might be expected as recorded in adjacent Turkmenistan (Szczerbak & Golubev 1996).



*Crossobamon eversmanni* C-N Bukhara province (Photo: David A. Showler).

**Genus *Mediodactylus*:** *Mediodactylus*, previously regarded as a subgenus or synonym of *Cyrtopodion* (bent-toed geckos), is now considered a valid genus (Bauer et al. 2013).

- Transcaspian bent-toed gecko *Mediodactylus russowii* (Strauch, 1887)

**Synonyms:** *Cyrtopodion russowii*, *Mediodactylus russowii*, *Tenuidactylus russowii*.

**Distribution in Uzbekistan:** Mainly SE and E, from 39°N 67°E (S Jizzakh/NE Samarkand provinces) to the Eastern provinces where widespread (Bannikov et al. 1977: map 35, Szczerbak & Golubev 1996: Fig. 74, Vashetko et al. 2003: Fig. 2). Scattered records elsewhere: in Karakalpakstan recorded from (i) Shakhpakhty area and Sarygamys depression, S Kungiro (Qo'n'irat) district (Murzakhanov 2012); (ii) 'Chink of Ustyurt near Lake Sudochoye' [approx. 43°35'N 58°30'E, 50 km SW of Muynak (Mo'ynoq) city]; (iii) 'Chabankazghan' on the border with Kazakhstan [approx. 43°50'N 61°30'E] (Szczerbak & Golubev 1996); and (iv) three localities on the W Aral Sea coast (Bannikov et al. 1977), but these excluded by Szczerbak and Golubev (1996), and Sindaco and Jeremčenko (2008). In Khorezm known from 'Urgench' (Urgench) and 'Khazarasp' (Szczerbak & Golubev 1996). Status in the Kyzylkum unclear, pre-1986 records from three unnamed but mapped localities are described simply as 'S Kyzylkum' (Szczerbak & Golubev 1996), from W to E, approximately: (i) 30-35 km NW of Bukhara city [39°54'N 64°06'E; 210 m asl] towards the northern edge of, but within, a now extensive agricultural area adjacent to the desert; (ii) Kokcha village/Zafarabad town area [40°32'N 65°01'E; 327 m asl] ; and (iii) near Sanchikul village [40°06'N 65°34'E; 389 m asl] 16 km ENE of Navoi city within an extensive agricultural area. Today, due to agricultural expansion in recent decades, only the Kokcha-Zafarabad locality might be considered in the desert. Not indicated as in the S Kyzylkum by Sindaco and Jeremčenko (2008), who do though map isolated presence further north in C Navoi (map 36: 41°N 63°E), but the source of the information regarding this could not be deduced. Undocumented in the Sundukli Sands of Uzbekistan but recorded in adjacent Turkmenistan (Schammakovi et al. 1993).

Altitudinal limits are estimated at from about 70 m (NE Karakalpakstan) up to 1,800 m asl, perhaps a little higher (Kamchik Pass area of Tashkent/Namangan; Vashetko et al. 2003). In the Naryn depression (Kyrgyzstan) recorded up to 2,000 m (Szczerbak & Golubev 1996).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2009).

**Ssp:** 2: nominate in Uzbekistan.

**Remarks:** In sand desert *M. russowii* is associated with large shrubs and trees, e.g. saxaul *Haloxylon* spp. (Szczerbak & Golubev 1996). Mature saxaul woodland is now a very rare habitat in Uzbekistan as saxaul (collection previously unregulated) has been unsustainably exploited for fuelwood. As such, loss of desert woodland probably has detrimentally impacted some populations. May occur around buildings and forage around lights at night on small insects.



*Mediodactylus russowii* Ustyurt State Nature Reserve, Kazakhstan (Photo: Mark Pestov).

**Genus *Tenuidactylus*:** Previously regarded as a subgenus or synonym of *Cyrtopodion* (bent-toed geckos), *Tenuidactylus* is now considered a valid genus (Bauer et al. 2013).

- Caspian bent-toed gecko *Tenuidactylus caspius* (Eichwald, 1831)

**Synonyms:** *Cyrtopodion caspium*, *Cyrtopodion caspius*, *Gymnodactylus caspius*.

**Distribution in Uzbekistan:** From north (Karakalpakstan) to south (Surkhandarya) in lowland desert/semi-desert and hills, with a few records in the SE, absent from E. Recorded as far north as Urga (SW Aral Sea coast [approx. 44°02'N 58°15' E], Karakalpakstan), south through the Amu Darya deltaic plain where widespread (Szczerbak & Golubev 1996: Fig. 61); also in S Ustyurt, Kungiroi (Qo'n'irat) district, in the Shakhpakhty area, and Assake-Audan and Sarygamysh depressions (Murzakhanov 2012). There are scattered localities through the Kyzylkum to S Uzbekistan (Szczerbak & Golubev 1996). In the C Kyzylkum widespread in semi-desert and hills of C-N Bukhara (40°N 62-64°E, 180-250 m asl; DS pers. obs. 2012-2015). In SE local, documented from as far west as the 'Karakul Reserve' (20 km S of Alat), then eastwards to Bukhara city area, the 'Nuratau Ridge: Temirkauk Well' [= Temir-Kabuk, approx. 40°43'N 66°25'E] (Szczerbak & Golubev 1996) and Karnabchul steppe, S Navoi (39°55'N 65°09'E, 310 m asl; T. Martin pers. comm. 2018). In S recorded from '60 km N Karshi: Uch-tepe locality' [Uch-tepe weather station lies at 38°48'N 66°22'E, east of Karshi city], N Kashkadarya, and 'Termez', S Surkhandarya (Szczerbak & Golubev 1996). Approaching the eastern limits of the species distribution, a disjunct population is present in the western Fergana Valley (south of Tashkent province) in adjacent 'Leninabad Dist.' [now Ghafurov district], N Tajikistan ([mapped north of Ghafurov town at approx. 40°25'N 69°40'E]; Szczerbak & Golubev 1996), but not documented for Tashkent province itself (Vashetko et al. 2003).

Altitudinal limits in Uzbekistan uncertain. Estimated as from about 60 m asl (south of Ara Sea) up to at least 400 m (Temir-Kabuk in foothills of the Nuratau Range). Known from higher elevations elsewhere, e.g. up to 900 m in the Kopet Dagh (S Turkmenistan/NE Iran), and 1,653 m in N Afghanistan (Szczerbak & Golubev 1996).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** 2: nominate in Uzbekistan.

**Remarks:** In the Kyzylkum observed (at night) in shrubby desert on semi-consolidated substrates (e.g. silt with gravel/stones and/or boulders), as well as low down on walls and amongst piles of broken concrete slabs (DS pers. obs. 2012-15); also on loose sand where in fairly close proximity to solid substrates (natural and man-made).



*Tenuidactylus caspius* C-N Bukhara province (Photo: David A. Showler).

- Turkestan bent-toed gecko *Tenuidactylus fedtschenkoi* (Strauch, 1887)

**Synonyms:** *Cyrtopodion fedtschenkoi*, *Gymnodactylus fedtschenkoi*.

**Distribution in Uzbekistan:** Primarily SE and S, but also local in the (SE) Kyzylkum. In SE, recorded from Bukhara city, east along the Zerafshan Darya (Katturgan Reservoir and Samarkand) to as far east as 'Khavast; Djulanghar' ([Khavast town, 40°13'N 68°50'E; 363 m asl]; Szczerbak & Golubev 1996), S Sirdarya province; also on isolated rocky outcrops on Karnabchul steppe and common in low mountains just to the north (39°56'N 65°10'E, 350 m asl; T. Martin pers. comm. 2018). In the SE Kyzylkum recorded east of Zerafshan city (41°N 65°E; Sindaco & Jeremčenko 2008: map 38); 'Western Aktau: Kockcha Village' ([40°32'N 64°59'E]; Szczerbak & Golubev 1996); rocky hills 1 km E of Zafarabad town (40°32'N 65°01'E, 385 m asl; DS pers. obs. 2013); and on the desert periphery 5 km SW of Nurata (Nurota) town in the Aktau foothills (approx. 40°33'N 65°40'E), S Navoi. In S recorded in NE Kashkadarya and widespread through Surkhandarya (Bannikov et al. 1977: map 37, Szczerbak & Golubev 1996: Fig. 64).

In Uzbekistan known from at least as low as 230 m asl (Bukhara city; DS pers. obs. 2013) up to 1,036 m (i.e. elevation of 'Derbent Settlement' [38°13' 67°01'E], Surkhandarya; Szczerbak & Golubev 1996). In Tajikistan recorded up to 2,300 m asl (Chernov 1959 in Szczerbak & Golubev 1996).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.

**Remarks:** Usually in rocky areas, also inhabits buildings where several may gather and forage at night on small insects attracted to lights.



*Tenuidactylus fedtschenkoi* in hills east of Zafarabad, E Bukhara province (Photo: Maxim A. Koshkin).

### [?] Long-legged bent-toed gecko *Tenuidactylus longipes* (Nilosky, 1896)

**Synonyms:** *Cyrtopodion longipes*, *Gymnodactylus longipes*.

**Distribution and Status:** Ananjeva et al. (2006) report three specimens (in Zoo. Inst. of the Russian Academy of Sci. collection) of *Cyrtopodion* (= *Tenuidactylus*) *l. longipes* (Nikolsky's bent-toed gecko) as collected in 1916 from the vicinity of Termez town (Surkhandarya) - essentially the southern-most point of Uzbekistan on the border with Afghanistan. However, there appear no other records of the species from this area and the distribution of *T. l. longipes* is generally described as E Iran and SW Afghanistan (e.g. Ananjeva et al. 2006, Sindaco & Jeremčenko 2008, Szczerbak 2003). In Afghanistan it is not vouchered by specimens but based on occurrence on the Iranian side of the border it is considered that 'there is a high possibility that it also occurs on the Afghan side' (Wagner et al. 2016a). Regardless, this lends weight to absence from Uzbekistan, as likely areas of occurrence in SW Afghanistan are far (over 600 km) from Uzbekistan. The nearest confirmed localities to Uzbekistan appear to be of the subspecies *T. l. microlepis* (sometimes considered a species), about 300 km to the WSW in S Turkmenistan (Szczerbak & Golubev 1996: Fig. 64). Thus, perhaps the records from Termez are attributable to an incidence of human importation or erroneous (e.g. due to mislabelling of collection locality), or perhaps its range is much more widespread than currently known.

**Red List Category:** *T. (l.) longipes* and *T. (l.) microlepis* Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic or 2 (nominate and *T. l. microlepis*). *T. l. microlepis* (S Turkmenistan and NW Iran), is treated as a species, *T. microlepis*, by Nazarov and Poyarkov 2013 (in Nazarov & Shestopal 2017b).

**Remarks:** Note, in the Iranian checklist of Šmíd et al. 2014, *T. longipes* is mentioned as in W Afghanistan but no reference is cited. Alternatively, Afghan records may stem from when *Tenuidactylus* (*Cyrtopodion*) *voraginosus* (S Afghanistan endemic), now raised to species rank (Bauer et al. 2013), was considered a subspecies of *C. longipes* (Wagner et al. 2016a).

### Family Sphaerodactylidae (Plate-tailed geckos)

- Turkestan plate-tailed gecko *Teratoscincus scincus* (Schlegel, 1858)

**Synonyms:** *Stenodactylus scincus*, *Teratoscincus rustamowii*.

**Distribution in Uzbekistan:** *T. t. scincus* is widespread in sandy desert from N to S. In Karakalpakstan recorded in the Assake-Audan depression and Sarygamysh depression (Murzakhanov 2012), and around the southern and eastern periphery of the Aral Sea (Bannikov et al. 1977: map 34, Szczerbak & Golubev 1996: Fig. 12). Southeastwards through the Kyzylkum, there are a few documented localities (Bannikov et al. 1977, Szczerbak & Golubev 1996); but widespread (and common) in the C-S of the desert through C-N Bukhara province (40°N 62-64°E, 165-200 m; DS pers. obs. 2012-15), and also SE Navoi (41°06'N 64°53'E, 110-130 m; T. Martin pers. comm. 2018). Very local in SE (Samarkand and S Navoi provinces) and S (S Surkhandarya; Szczerbak & Golubev 1996). A separate population, *T. s. rustamowi*, is endemic to the Fergana Valley of E Uzbekistan and adjacent N Tajikistan. It is mostly found on sands of W Fergana province, sites including (formerly at least) Buvaidy Station [40°38'29"N 71°05'10"E] near Kokand city (Szczerbak & Golubev 1996), the Akkum (Peski Akkum) [approx. 40°45'N 71°23'E] and Yazyavan deserts between Kokand and Shakhrikhan town (Azimov et al. 2009), with other sites scattered through W and C Fergana (Nazarov et al. 2016: Fig. 1). There are also three localities in S Namangan province including, the northern-most, located north of the Naryn River (Nazarov et al. 2016) between Chust and Namangan cities [approx. 40°57'N 71°24'E].

*T. scincus* occurs below 2,000 m (Macey et al. 1997). In Uzbekistan, nominate recorded from at least as low as an estimated 70 m asl (NW Kyzylkum, Karakalpakstan) up to about 350 m (Djarkurgan (Jarqo'rg'on), S

Surkhandarya). There is an old record from ‘Samarkand’ (Nikolsky 1915 *in* Szczerbak & Golubev 1996); Samarkand city lies between 650-750 m asl (but this may not reflect the elevation of the actual site locality). Localities for *T. s. rustamowi* are estimated at between 370 to 490 m asl.

**Red List Category:** Not yet assessed (IUCN 2018). *T. s. rustamowi* Endangered, RDB of Uzbekistan (Azimov et al. 2009); extirpated from most previously occupied areas due to conversion to agriculture (e.g. for cotton production).

**Ssp:** 2: nominate widespread; *T. s. rustamowi* endemic to Fergana and Namangan provinces (and N Tajikistan).

**Remarks:** *T. s. rustamowi* is treated as a species ‘*Teratoscincus rustamowii*’ by Nazarov et al. (2016).



*Teratoscincus scincus* C-N Bukhara province (Photo: David A. Showler).

## Family Agamidae (Agamids)

**Genus *Paralaudakia*:** Commonly known as Asian rock agamas, the two species occurring in Uzbekistan were reassigned from *Laudakia* (formerly *Agama*, now restricted to African species) to the new genus *Paralaudakia* (currently comprising 8 spp.) following morphological-based revisions by Baig et al. (2012). Although Himalayan rock agama *P. himalayana* is indicated in some publications (e.g. Szczerbak 2003) as in mountains of S/SE Uzbekistan, it is not considered present as these records are deemed referable to *P. bochariensis* (see *Paralaudakia bochariensis* species account).

- Bochar rock agama *Paralaudakia bochariensis* (Nikolsky, 1897)

**Synonyms:** *Agama chernovi*, *Laudakia chernovi*, *Paralaudakia himalayana bochariensis*.

**Distribution:** Endemic to mountains of southern Central Asia: SW Tajikistan, adjacent S Uzbekistan and SE Turkmenistan in the western Pamir-Altai region (Gissar and Zeravshan Ranges and Kugitang-Tau Mountains; Ananjeva et al. 2006). In Tajikistan confined to the southwest in the Gissar and Vakhsh Mountains, and in SE Turkmenistan to the Kugitang Mountains (Shestapol et al. 2017). See also: Remarks.

**Distribution in Uzbekistan:** Montane, described as confined to the ‘western side of the Baisoon and Gissar Mountains’ (Shestapol et al. 2017). The Baisoon (Baisun, Baysun) Mountains lie mainly in N Surkhandarya (along the border with Kashkadarya province to north) rising from just north of Baysun town (38°12’N 67°12’E) and contiguous with the Vakhsh Mountains to the east (that run along the northwest border of adjacent Khatlon province, SW Tajikistan). The Gissar Range runs NE-SW from Tajikistan through SE Kashkadarya and N Surkhandarya (Uzbekistan), the Kugitang lie at the southwestern extremity of the Gissar Range, straddling the Turkmenistan-Uzbekistan border.

Through its distribution range, recorded from 1,200 to 3,100 m asl (Shestapol et al. 2017).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.

**Remarks:** Sindaco and Jeremčenko (2008) include S Kyrgyzstan in the distribution of *P. bochariensis* (probably based on a locality indicated on a distribution map in the thesis of Baig, 1992), but distribution simply described as ‘Tadjikistan and Uzbekistan (western side of Pamir)’ in Baig et al. (2012), and presence in Kyrgyzstan considered doubtful (Shestapol et al. 2017).

Although *P. himalayana* is indicated in some publications (e.g. Szczerbak 2003) as in mountains of S/SE Uzbekistan, it is not considered present. Most records of *P. himalayana* from Central Asia (i.e. SE Uzbekistan, SE Turkmenistan, S Kyrgyzstan and Tajikistan) are considered by Baig 1992 (*in* Sindaco & Jeremčenko 2008) as referable to *Laudakia* [*Paralaudakia*] *bochariensis*. In their ‘*Laudakia himalayana*’ account, Sindaco and Jeremčenko (2008) further emphasise that data [i.e. records of *himalayana*] ‘from Turkmenistan, Uzbekistan and Kyrgyzstan, and probably Tajikistan’ must be referred to *L. bokhariensis*. In mountains of the Zerafshan Range, W Tajikistan, Ananjeva et al. (1981) described ‘*Agama chernovi* sp. nov.’ at a locality close to Uzbekistan, but subsequently it is suggested that *A. chernovi* be considered a junior synonym of *L. bochariensis* (Baig et al. 2012).

- Turkestan rock agama *Paralaudakia lehmanni* (Nikolsky, 1896)

**Synonyms:** *Agama lehmanni*, *Laudakia lehmanni*, *Stellio lehmanni*.

**Distribution:** Endemic to the Pamir Mountains (Pamirs) of southern Central Asia: SE Turkmenistan, SE/S Uzbekistan, N Afghanistan, W Tajikistan and S Kyrgyzstan.

**Distribution in Uzbekistan:** Mainly rocky foothills and mountains of SE, including: the Nuratau Range (S Jizzakh/S Navoi/N Samarkand provinces) incorporating the southern Aktau spur (e.g. Sarmysh Nature Park, 40°19'N 65°39'E, S Navoi); low mountains (rising to 703 m asl; 39°56'N 65°10'E) at the northern edge of the Karnabchul steppe, 20 km southwest of Navoi city (T. Martin pers. comm. 2018); the Oalyk (Agalyk) Mountains (Wagner et al. 2016a) in the Zerafshan Range about 8 km southwest of Samarkand city; and the Turkestan Ugam Range east to [approx. 39°45'N 68°27'E] SE Jizzakh province. Also in S, in the Kugitang Mountains where recorded northwest of Sherabad (SW Surkhandarya) on the border with SE Turkmenistan [approx. 37°55'N 66°43'E] (Ananjeva & Golynsky 2013: Fig. 1). Not recorded in E Uzbekistan (e.g. Vashetko et al. 2003) but widespread in adjacent N Tajikistan and Kyrgyzstan foothills along the southern periphery of the Fergana Valley, e.g. in the Mogoltau Range [40°19'N 69°28'E] of Tajikistan (Baig et al. 2012) that borders Tashkent province to the southwest, and mountains further east (east to Dodon village, Kyrgyzstan; 40°19'N 72°16'E; Ananjeva & Golynsky 2013) fringing S Tashkent/W Namangan and S Fergana provinces. Given proximity to known localities in Tajikistan and Kyrgyzstan, and that distribution modelling indicates 'medium habitat suitability' (Ananjeva & Golynsky 2013), it might be expected to occur in mountains of S Tashkent, NW Namangan and/or SW Fergana.

*P. lehmanni* has been observed as low as 320 m asl on rocky/scree spurs of low mountains (39°56'N 65°10'E) 20 km southwest of Navoi city (T. Martin pers. comm. 2018). This is of considerably lower elevation than previously recorded (i.e. 457 m in Mazar-i-Shrif, N Afghanistan [60 km S of the border with Surkhandarya]; Anderson & Leviton 1969 in Baig et al. 2012). Upper altitudinal limits in Uzbekistan uncertain; through its range recorded up to 2,600 m (Ananjeva et al. 1998 in Baig et al. 2012).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.

**Remarks:** Sindaco and Jeremčenko (2008) state that *P. lehmanni* occurs in extreme S Kazakhstan and it is mapped (map 87) on the border adjacent to NE Jizzakh province (Uzbekistan). However, the (sole) area in Kazakhstan where recorded in 1956 (low mountains northeast of the Nuratau Range) now lies within Uzbekistan territory (Dujsebajeva 2010), therefore no longer included on the Kazakhstan national checklist.



*Paralaudakia lehmanni*, mountains north of Karnabchul steppe, S Navoi province (Photo: Tom Martin – RENECO - ECCH).

**Genus *Phrynocephalus*:** A taxonomically difficult genus due to high polymorphism in Central Asia and the many 'forms' (species/subspecies and substrate varieties) described (Barabanov & Ananjeva 2007), especially within the former USSR, including Uzbekistan. As such, subject to ongoing research and revision.

- Spotted toad-headed agama *Phrynocephalus guttatus* (Gmelin, 1789)

**Distribution in Uzbekistan:** *P. g. guttatus* (the taxa considered here) appears confined within Uzbekistan to isolated populations on sands around the southern coast of the Aral Sea [altitudinal range approx. 60-120 m asl] in Karakalpakstan (Barabanov & Ananjeva 2007). Note, however, it is mapped (in isolation) as present much further southeast in the C-E Kyzylkum, 42°N 65°E (map 94), by Sindaco and Jeremčenko (2008).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic to 5 (see: Remarks): nominate in Karakalpakstan (NW Uzbekistan).

**Remarks:** Taxonomy of the '*P. guttatus* group' is unresolved. *P. moltschanovi*, treated as a species in the checklist (see below), is often considered a subspecies or variant of *P. guttatus*. Phylogenetic analysis supports elevation to species rank of three of the four previously generally recognised *P. guttatus* ssp. (Solovyeva et al. 2014), one being *P. moltschanovoi* (as well as *P. alpherakii* of the Ili River valley in extreme E Kazakhstan/W China, and *P. melanurus* of E Kazakhstan).

- Sunwatcher toad-headed agama *Phrynocephalus helioscopus* (Pallas, 1773)

**Distribution in Uzbekistan:** Nominate widespread but mostly tied to localised areas of silty and clay substrates within otherwise sandy semi-desert. Recorded in W Karakalpakstan on the Ustyurt Plateau (Bannikov et al. 1977: map 47) including the Shakhpakhty area, Assake-Audan depression and Sarygamysh depression (Murzakhanov 2012). Very few records from the N Kyzylkum but several localities in the C-S part of the desert (Bannikov et al. 1977), including more recently in foothills of the Kuldjuktai Mountains, SW Navoi/N Bukhara (40°46'N 63°47'E; V. Terentyev pers. obs. 2013) and near Shuruk village (40°41'N 63°47'E; J. Guilherme pers. obs. 2016), and about 20 km NW of Lake Ayakagytma (40°48'N 64°23'E; DS pers. obs. 2015), N Bukhara province. Numerous localities in SE (e.g. abundant on loessial deposits of the Karnabchul steppe at around 300 m asl, S Navoi; T. Martin pers. comm. 2018); also recorded in S Surkhandarya (Bannikov et al. 1977). Not documented from the Sundukli Sands in Uzbekistan but known from adjacent Turkmenistan (Schammakov et al. 1993).

*P. h. saidalievi* is endemic to the Fergana Valley foothills of E Uzbekistan, N Tajikistan and S Kyrgyzstan. In Uzbekistan it is known from only nine scattered sites in S and W Fergana (5 sites), W Namangan (2 sites) and extreme E Andijan (2 sites; Nazarov et al. 2016: Fig. 3).

Within Uzbekistan, altitudinal limits of *P. h. helioscopus* are estimated as from 40 m asl (S Ustyurt, Karakalpakstan) up to 480 m (Kuldjuktai foothills, SW Navoi; pers. obs. V. Terentyev 2013). *P. h. saidalievi* occurs from an estimated 400 m (near Kokand city) up to 900 m (west of Churst city).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2009); *P. h. saidalievi* (treated as a sp. by IUCN), Vulnerable (IUCN 2018; last assessed 2016). *P. h. saidalievi*: Endangered, RDB of Uzbekistan (Azimov et al. 2009); declines attributed primarily due to habitat loss due to agricultural development.

**Ssp:** 3: nominate through most of Uzbekistan; *P. h. saidalievi* in Fergana Valley foothills.

**Remarks:** In the checklist *P. h. saidalievi* is considered a subspecies of *P. helioscopus* (following Barabanov & Ananjeva 2007), although afforded species rank (i.e. Said-Aliev's toad-headed agama *Phrynocephalus saidalievi* Sattorov, 1981) by some authorities.



*Phrynocephalus helioscopus*, Kuldjuktai foothills, SW Navoi province (Photo: Vladimir Terentyev).

- Rose-shouldered toad-headed agama *Phrynocephalus interscapularis* Lichtenstein, 1856

**Synonyms:** *Phrynocephalus (Microphrynocephalus) interscapularis*, *Phrynocephalus sogdianus*.

**Distribution in Uzbekistan:** Nominate widespread in sandy desert/semi-desert, from the S Aral Sea coast and Amu Darya deltaic plain (Karakalpakstan), southwards through the Kyzylkum (Bannikov et al. 1977: map 54, Sindaco & Jermčenko 2008: map 90). Widespread (and common) in the C-S Kyzylkum in C-N Bukhara (40°N 62-64°E, 165-220 m; DS pers. obs. 2012-15) and SE Navoi (e.g. dune field at 40°52'N 65°03'E, 150-200 m asl; T. Martin pers. comm. 2018). In SE Uzbekistan there are a few scattered localities mapped along the Zerafshan Darya from the Alat area/N Sundukli Sands, eastwards to a little north of Bukhara city, and in desert to the southeast in Karaul Bazar (Qoroulbozor) district (Bukhara province); absent from the E (Bannikov et al. 1977). It seems likely, given irrigation projects/agricultural expansion, that habitat at some sites where previously recorded in the vicinity of the Zerafshan Darya is no longer suitable. Recorded from an estimated 50 m asl (Aral Sea coast) up to at least 220 m (C Kyzylkum; DS pers. obs. 2013).

*P. i. sogdianus* (Sogdian toad-headed agama) is endemic to sands of S Uzbekistan (S Surkhandarya) and SW Tajikistan (from the Surkhan Darya valley eastward to the eastern border of the Vakhsh River valley, Tajikistan; Ananjeva et al. 2006, Szczerbak 2003), and adjacent N Afghanistan (Wagner et al. 2016a). Widespread in S Surkhandarya (Bannikov et al. 1977: map 54 '*Phrynocephalus sogdianus*') where the estimated elevation of sand habitats is between 280-400 m asl. The type locality 'Pjandzh village' [approximately 37°14'N 69°05'E] (Barabanov & Ananjeva 2007) in SW Tajikistan, lies at about 360 m asl. Recorded up to 400 m in adjacent N Afghanistan (Wagner et al. 2016a).

**Red List Category:** Not yet assessed (IUCN 2018).



**Ssp:** 2: nominate through most of range in Uzbekistan; *P. i. sogdianus* endemic to S Uzbekistan, SW Tajikistan and N Afghanistan.

**Remarks:** ‘Sogdian toad-headed agama’ has variably been considered a subspecies of *P. interscapularis* or afforded species rank, i.e. *P. sogdianus*. A recent phylogenetic analysis (mitochondrial DNA sequencing; Solovyeva et al. 2014) found insignificant differentiation between *interscapularis* and *sogdianus* (thus *sogdianus* treated as a ssp. in the checklist), and *P. interscapularis* was assigned to the new subgenus *Microphrynocephalus*.



*Phrynocephalus interscapularis* C-N Bukhara province (Photo: David A. Showler).

- Molchanov’s toad-headed agama *Phrynocephalus moltschanovi* Nikolsky, 1913

**Synonyms:** *Phrynocephalus guttatus moltschanovi*, *Phrynocephalus guttatus moltschanovii*, *Phrynocephalus guttatus moltschanowi*.

**Distribution in Uzbekistan:** A restricted-range endemic confined to the Amu Darya deltaic plain adjacent to the Aral Sea, Karakalpakstan. The type locality is Bel’tau (Beltau) Mountain within the Amu Darya estuary, with records from the southeast part of the ‘Bel’tau upland’ (Ananjeva et al. 2006). Bel’tau is situated in the northern part of the Akcha Darya delta (located east of the modern Amu Darya delta) ‘on its right bank’ (Zonn et al. 2009). *P. moltschanovi* is described as occurring on clayey deposits in inter-stream areas of the ancient northern Akhchadar alluvial-deltaic plain within the Amu Darya delta, and also ancient deltas of the Syr Darya (Ananjeva et al. 2006, Solovyeva et al. 2014).

**Red List Category:** Not yet assessed (IUCN 2018). Data Deficient, RDB of Uzbekistan (Azimov et al. 2009).

**Ssp:** Monotypic (but see Remarks).

**Remarks:** Taxonomy unresolved. Treated as a species, or subspecies (i.e. *P. guttatus moltschanovi*) or variant or a synonym of *P. guttatus* (Barabanov & Ananjeva 2007). A recent phylogenetic analysis supports species rank (Solovyeva et al. 2014) but considered a synonym of *P. guttatus* by Uetz and Hošek (2017).

There appears to be little available information generally, regarding *P. moltschanovi*.

- Frilled toad-headed agama *Phrynocephalus mystaceus* Pallas, 1776

**Synonyms:** *Megalochilus mystaceus*.

**Distribution in Uzbekistan:** Widespread in lowland sand desert from east of the Amu Darya delta (Karakalpakstan), south through the Kyzylkum to S Surkhandarya (Bannikov et al. 1977: map 52, Sindaco & Jeremčenko 2008: map 89, Szczerbak 2003). Absent from the SE and E.

Within Uzbekistan, recorded from an estimated 60 m (Karakalpakstan) up to 220 m asl (barkan dunes at 40°15’N 64°19’E in the Kyzylkum, E Bukhara province; DS pers. obs. 2013).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 2 usually recognised: *P. m. galli* in Asian part of range (including Uzbekistan) and nominate in European range (i.e. to west and north of the Caspian Sea, east to the Volga-Ural Sands; Barabanov & Ananjeva 2007) but with evidence of intergradation (Szczerbak 2003).

**Remarks:** Ananjeva (1986, 1987) proposed restoring *P. mystaceus* to the genus *Megalochilus* (Eichwald, 1831), supported by a phylogenetic study (Melville et al. 2009). The situation is unresolved thus *Phrynocephalus* is followed in the checklist.

*P. mystaceus* occurs almost exclusively on mobile wind-driven sand expanses and larger dunes (Clemann et al. 2008), including sometimes, those accumulating along roadsides and buildings (DS pers. obs. 2012-15).



*Phrynocephalus mystaceus* on barkhan dune, C Bukhara province (Photo: João Guilherme).

- Radde's toad-headed agama *Phrynocephalus raddei* Boettger, 1888

**Synonyms:** *Phrynocephalus raddei*, *Phrynocephalus raddei* var. *boettgeri*, *Phrynocephalus reticulatus*.

**Distribution:** Southwestern Central Asian endemic found in extreme S Uzbekistan, S and SE Turkmenistan, extreme SW Tajikistan, N Afghanistan (Bannikov et al. 1977, Sindaco & Jeremčenko 2008, Wagner et al. 2016a) and NE Iran (Khosravani et al. 2014).

**Distribution in Uzbekistan:** Restricted to S Surkhandarya province (Bannikov et al. 1977: map 50, Sindaco & Jeremčenko 2008). Considered rare, inhabiting clay desert in lowland areas with some hills and sparse seasonal vegetation (Sattorov, Shestapol & Nazarov 2017).

Altitudinal limits unclear, a lowland species 'with an upper elevation limit at or below 1,000 m asl' (Sattorov, Shestapol & Nazarov 2017).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** 2 (but see Remarks): *P. r. boettgeri* in Uzbekistan.

**Remarks:** Treated as monotypic by Barabanov and Ananjeva (2007) who consider *P. r. boettgeri*, a synonym of *P. raddei*, but treated as a subspecies by Solovyeva et al. (2014). *P. r. boettgeri* occurs through most of species range, *P. r. raddei* is restricted to S Turkmenistan (Sindaco & Jeremčenko 2008) and NE Iran (where recently discovered; Khosravani et al. 2014).

Within Uzbekistan, *P. raddei* occurs in an area attractive for pastoral agriculture (sheep and goat grazing) and is of conservation concern (likewise in adjacent SW Tajikistan) as much of its habitat has been destroyed as a result [of overgrazing] (Sattorov, Shestapol & Nazarov 2017). Habitat (through range) described as 'hard earthy or, rarely, rocky soils' (Szczerbak 2003).

- Ocellated toad-headed agama *Phrynocephalus reticulatus* Eichwald, 1831

**Synonyms:** *Phrynocephalus ocellatus*.

**Distribution:** Western Central Asian endemic. There are two populations separated by the Karakum desert, one (*P. r. bannikovi*) in NW Turkmenistan, the other (*P. r. reticulatus*) about 600 km to east in E Turkmenistan and the Kyzylkum of Uzbekistan.

**Distribution in Uzbekistan:** Local in gravelly areas of sand desert, mainly in the C-W Kyzylkum between Uchkuduk and Bukhara city (Barabanov & Ananjeva 2007), extending in the SE Kyzylkum to as far east as 39°N 67°E, and south to the Alat area (39°N 63°E; Sindaco & Jeremčenko 2008: map 97). Absent from the Sundukli Sands. Also long ago reported as in the 'Karshi desert, SE of Bukhara' (Nikolsky 1905 in Barabanov & Ananjeva 2007), where current status is unknown.

Localities indicated in Bannikov et al. (1977: map 53) in Karakalpakstan southeast of the Aral Sea (and also those in Kazakhstan), appear erroneous and suggested as may be referring to specimens wrongly identified or mislabelling of collection localities (Dunayev 1995). Localities indicated in the Fergana Valley (Bannikov et al. 1977), said by Sindaco and Jeremčenko (2008) to be erroneous as *P. reticulatus* is replaced here by *P. strauchi*, presumably can simply be explained by *P. strauchi* being previously considered a subspecies of *P. reticulatus*.

Observed in the Kyzylkum (C-N Bukhara province) at altitudes of 185 to 210 m asl (DS pers. obs. 2012-15).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** 2: nominate in Uzbekistan.

**Remarks:** Erroneously reported from N Afghanistan by Leviton and Anderson (1970 in Wagner et al. 2016a) who mention *boettgeri* as a subspecies of *P. reticulatus* (now recognised as synonym or ssp. of *P. raddei*) and thus deleted from the Afghan checklist (Wagner et al. 2016a). Given this, presumably incorrectly mapped as in N Afghanistan by Sindaco and Jeremčenko (2008) and unlikely in bordering S Surkhandarya (S Uzbekistan).



*Phrynocephalus reticulatus* C-N Bukhara province (Photo: David A. Showler).

- **Khentau toad-headed agama** *Phrynocephalus rossikowi* Nikolsky, 1898

**Distribution:** Western Central Asian endemic. Nominate occurs mainly along the Amu Darya valley in NW Uzbekistan and NE Turkmenistan, with an isolated population (*P. r. shammakowi*) in the Karakum Desert of N Turkmenistan (Sindaco & Jeremčenko 2008, Szczerbak 2003).

**Distribution in Uzbekistan:** Very local, restricted to Karakalpakstan and Khorezm mostly in areas adjacent to the Amu Darya, also peripheral N Kyzylkum (Golubev et al. 1994). In Karakalpakstan recorded from areas near Muynak (43°47'50"N 59°01'24"E) and Nukus cities, southeast to Turtkul city (42°18'N 60°03'E; Bannikov et al. 1977: map 50, Azimov et al. 2009). Eastwards on the northern periphery of the Kyzylkum, collected in Boktybulak area at 'Boktybulak Well, Taschuko Well and Bukan Well' (Golubev et al. 1994); Bukan (other wells not located) lies 212 km ENE of Nukus just northwest of the border with Navoi province and 40 km south of the border with Kazakhstan. In Khorezm it occurs west of the Amu Darya, likewise south of Khorezm restricted to the west (i.e. Turkmenistan) side of the river, where recorded as far south as between Lake Danishor and Neftezavodsk town/village ([39°20'34"N 62°56'40"E]; Bannikov et al. 1977, Ananjeva et al. 2006).

Altitudinal limits uncertain; a lowland species occurring up to 500 m (Shestapol, Ananjeva & Nazarov 2017).

**Red List Category:** Endangered (IUCN 2018; last assessed 2014). Endangered, RDB of Uzbekistan (Azimov et al. 2009); extirpated from most localities and only low numbers recorded where still found, declines are attributed to agricultural development of virgin desert.

**Ssp:** 2: nominate in NW Uzbekistan.

**Remarks:** Originally described from Chen-tau (Khentau) mountain by the Amu Darya near Nukus, hence vernacular name. The population of *P. r. rossikowi* (Uzbekistan and Turkmenistan) has been estimated at only 2,000-3,000 individuals (Fet & Atamuradov 1994).

- **Fergana toad-headed agama** *Phrynocephalus strauchi* Nikolsky, 1899

**Synonyms:** *Phrynocephalus reticulatus strauchi*.

**Distribution:** Endemic to the Fergana Valley of Uzbekistan, Tajikistan and Kyrgyzstan (Sindaco & Jeremčenko 2008, Sattorov et al. 2017; but see Remarks).

**Distribution in Uzbekistan:** Within Uzbekistan restricted to remnant areas of sand, sand-clay and gravel desert in S Namangan, Fergana and N Andijan provinces (Nazarov et al. 2016: Fig. 4).

Localities given in Nazarov et al. (2016) suggests altitudinal limits of about 350 m to 700 m asl. Indicated as 'found from sea level to 5-600 m asl' (T. Sattorov pers. comm. 2016 *in* Sattorov et al. 2017), but presumably in error as there are no areas within its range that lie as low as sea level.

**Red List Category:** Vulnerable (IUCN 2018; last assessed 2014); its distribution is severely fragmented and there is a continuing decline in extent and quality of its habitat due to the conversion of land to agriculture. Endangered, RDB of Uzbekistan (Azimov et al. 2009); declining due to agricultural development of virgin lands in desert zone.

**Ssp:** Monotypic.

**Remarks:** Said to be limited to the Fergana Valley of N Tajikistan and Uzbekistan (Ananjeva et al. 2006), but Kyrgyzstan is included by Sindaco and Jeremčenko (2008), and Sattorov et al. (2017). Not indicated as in Kyrgyzstan by Nazarov et al. (2016), although the closest locality, Uchkurgan (E Namangan), is on its border.

**Genus *Trapelus*:** *Trapelus* was previously part of *Agama* (*Agama* now retained only for African spp.).

- **Steppe agama** *Trapelus sanguinolentus* (Pallas, 1814)

**Synonyms:** *Agama sanguinolenta*, *Trapelus agilis sanguinolentus*.

**Distribution in Uzbekistan:** Widespread in bushy semi-desert and arid foothills. Mostly absent from the Ustyurt Plateau (Karakalpakstan) but in S Ustyurt recorded in the Shakhpakhty area, Assake-Audan depression and Sarygamysh depression, S Kungirov (Qo'n'irat) district (Murzakhanov 2012), and widespread through the Amu Darya deltaic plain (Bannikov et al. 1977: map 42). Few documented localities in the N Kyzylkum (Bannikov et al. 1977, Sindaco & Jeremčenko 2008: map 100) but widespread further south. In E, absent from C/NE Tashkent and NW Namangan provinces (Vashetko et al. 2003).

Altitudinal limits in Uzbekistan uncertain, recorded from an estimated 50 m (N Karakalpakstan) up to at least 480 m asl (Kuldjuktai Mountains; DS pers. obs. 2013). In Turkmenistan recorded up to 1,200 m asl (Rustamova & Shammakov 1982).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 2: *T. s. aralensis* in Uzbekistan.

**Remarks:** Year of description by Pallas sometimes given as '1827'. A phylogenetic study (Pyron et al. 2013) indicates that *T. sanguinolentus* is a distinct species (as previously treated by many authorities) rather than a subspecies of *T. agilis* (i.e. *T. a. sanguinolentus*). More southerly Iranian, Afghan and other SW Asian populations are referred to as *T. agilis*, with a zone of sympatry with *T. sanguinolentus* in N Afghanistan (Wagner et al. 2106a).

Found on a variety of substrates from clay to sand to rock, but presence of moderate- to large-sized bushes (upon which they frequently sit) appears to be an essential habitat component.



*Trapelus sanguinolentus* on *Astragalus villosissimus*, C-N Bukhara province (Photo: David A. Showler).

## Family Scincidae (Skinks)

- Desert snake-eyed skink *Ablepharus deserti* Strauch, 1868

**Synonyms:** *Ablepharus tenuis*, *Ablepharus turkestanicus*.

**Distribution in Uzbekistan:** A relict population occurs along the Amu Darya valley from approximately as far north as Nukus city (42°25'N 59°37'N), S Karakalpakstan, just east of the Amu Darya, southwards to the west of the river into Khorezm, thence further south in SE Turkmenistan (Bannikov et al. 1977: map 49, Eremchenko [= Jeremčenko] & Szczerbak 1986: Fig. 24). Its main distribution in Uzbekistan (lowlands to uplands in mountains), broadly follows the Zerafshan Darya from the Alat area, northeast to Bukhara city, east through Samarkand and Sirdarya provinces, and through the Eastern provinces where widespread (Fuhn 1969: Fig. 16, Eremchenko & Szczerbak 1986, Vashetko et al. 2003: Fig. 4). Also in S Surkhandarya (Eremchenko & Szczerbak 1986).

Recorded from an estimated 80 m (Amu Darya valley, S Karakalpakstan) up to about 2,000 m asl (Kamchik Pass area, Tashkent/NW Namangan; Vashetko et al. 2003). Recorded at 3,000 m above Khujand city (formerly Leninbad) in adjacent NW Tajikistan (Fuhn 1969).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.

**Remarks:** *A. deserti* is not really a desert species (despite specific and common names). It occurs in semi-arid areas within damp habitats, e.g. around oases, along rivers and streams, and in man-made habitats such as margins of irrigated cultivated land and gardens (Fuhn 1969, Szczerbak 2003). It also occurs at high elevations where observed, for example, in the Chimgan Mountains (Tashkent province) inhabiting the lower edges of scree slopes part-covered in herbaceous vegetation and grasses at around 1,930 m asl (DS pers. obs. 2015).



*Ablepharus deserti* Chimgan, Tashkent province (Photo: David Hodkinson).

- Asian snake-eyed skink *Ablepharus pannonicus* (Fitzinger in Eversmann, 1823)

**Synonyms:** *Ablepharus brandti*, *Ablepharus pannonicus grayanus*, *Ablepharus persicus*.

**Distribution in Uzbekistan:** Foothills and mountains of the SE (Zerafshan and Turkestan Ugam Ranges) in SW Jizzakh and Samarkand provinces (Fuhn 1969: Fig.16, Bannikov et al. 1977: map 48), south through the Gissar Range (Bannikov et al. 1977, Eremchenko & Szczerbak 1986) within Kashkadarya and Surkhandarya. Recorded in the Fergana Range, Kyrgyzstan (Fuhn 1969), that borders the southern Fergana Valley, so might perhaps occur in adjacent S Fergana province (E Uzbekistan).

Altitudinal limits in Uzbekistan uncertain. Reported from ‘Samarkand’ (Fuhn 1969); Samarkand city lies between 650-750 m asl. In Central Asia found up to 2,800 m (Eremchenko & Szczerbak 1986), and in high altitude pastures frequently encountered up to 2,500 m (Fuhn 1969).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** Monotypic.

**Remarks:** Records of *A. pannonicus* (Lichtenstein, 1823/Fitzinger, 1824) from ‘Bokhara’ [= Bukhara city, the type locality] are considered by Cernov, 1959 (in Fuhn 1969) to be erroneous on the basis that: 1) Lichtenstein had two specimens of *A. deserti* (said to be common in the area at that time) and not *A. pannonicus* (unfortunately the specimens are lost so cannot be validated); 2) *A. pannonicus* had not been recorded from the Bukhara area since (there appear no, more recent records); and 3) habitat around Bukhara is not suitable (closest localities appear to be in foothills/mountains 150-200 km to the east). *A. pannonicus* is mapped as in 1° square 39°N 64°E (Sindaco & Jeremčenko 2008) that encompasses the Bukhara city area, but it is not indicated as occurring in this area by Fuhn (1969), Bannikov et al. (1977) nor Szczerbak (2003).

Note, the distribution map (Fig. 29) in Eremchenko & Szczerbak (1986), refers to *A. bivittatus* (mostly SW Iran), *A. lindbergi* (Afghanistan), as well as *A. grayanus* (Pakistan, NW India) and *A. pannonicus* (for clarification see Sindaco & Jeremčenko 2008: map 111).

Habitats include oases, riversides, foothills and grass-covered areas in mountains, also in man-made habitats e.g. canal banks, gardens and wasteland (Szczerbak 2003); never ranges far from water (Fuhn 1969).

- Alai skink *Asymblepharus alaicus* (Elpatjevsky, 1901)

**Synonyms:** *Ablepharus alaicus*, *Ablepharus saposhnikovii*.

**Distribution:** Southeastern Central Asian endemic of the Tien Shan and Pamir-Alai Mountains in S Kazakhstan, NE Uzbekistan, Kyrgyzstan and Tajikistan, east to extreme W Xinjiang, China (Ananjeva et al. 2006; Sindaco & Jeremčenko 2008).

**Distribution in Uzbekistan:** Restricted to mountains of NE Tashkent and NW Namangan provinces on the western spurs of the Tien Shan. Most known localities are in Botanlik district (Eremchenko & Szczerbak 1986: Fig. 5, Vashetko et al. 2003: Fig. 3), and these are mostly within the present-day ‘Ugam-Chatkal National Park’ northeast of Lake Charvak. A few localities lie east of Tashkent city on slopes and plateau above the Angren River, including one east of the river in NW Namangan at Kamchik Pass (Kamchiq Dovon) [41°06’N 70°31’E] (Vashetko et al. 2003).

Altitudinal limits in Uzbekistan uncertain, recorded up to approx. 2,270 m asl (Kamchik Pass area). Through range found from 800-4,000 m asl (Szczerbak 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 3: *A. a. yakovlevae* in Uzbekistan.

**Remarks:** In the Tien Shan, habitat is described as rocky valleys with herbaceous vegetation, and valleys with ‘steppic vegetation’ (Fuhn 1969), the latter presumably upland grass-dominated habitats.

- Gold skink *Eumeces schneideri* (Daudin, 1802)

**Synonyms:** *Scincus schneideri*, *Novoeumeces princeps*.

**Distribution:** Considered a species complex with populations in North Africa, Arabia, West and southern Central Asia, Pakistan and NW India. *E. s. princeps* occurs in the Caucasus and southern Central Asia.

**Distribution in Uzbekistan:** Found in foothills and valleys of the SE (but appears not to extend westwards into Bukhara province where there no records of the species were located) and S, from the Nuratau Range south through the Zerafshan and Gissar Ranges (Bannikov et al. 1977: map 62, Sindaco & Jeremcenco 2008: map 123). Recorded eastwards to Tashkent province where recorded on the western spurs of the Chatkal Range/lower reaches of the Chirchik River, and documented as far east as the west bank of the Angren River in foothills [approx. 41°05'N 70°03'E] rising to the north of Angren city (Vashetko et al. 2003: Fig. 1).

Altitudinal limits within Uzbekistan unclear, recorded at approx. 650 m asl on rocky slopes in a canyon at Sarmysh Nature Park, S Navoi (T. Martin pers. comm. 2018). Within the Caucasus/C Asia, recorded up to 1,400 m asl (Szczerbak 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 5: *E. s. princeps* in Uzbekistan.

**Remarks:** Assigned to a newly proposed genus (*Novoeumeces*) by Griffith et al. (2000), who elevated *E. s. princeps* to species rank (i.e. *N. princeps*). A subsequent phylogenetic review rejected this treatment, retaining its subspecies status within *Eumeces* (Schmitz et al. 2004). Publication year of species description sometimes given as 1803, i.e. '(Daudin, 1803)'.



*Eumeces schneideri* Sarmysh Nature Park, S Navoi province (Photo: Tom Martin – RENECO - ECCH).

## Family Anguinidae (Anguids)

- Glass lizard *Pseudopus apodus* (Pallas, 1775)

**Synonyms:** *Ophisaurus apodus*.

**Distribution:** C-E Mediterranean Europe, east to SC Kazakhstan.

**Distribution in Uzbekistan:** Widespread in plains, foothills and mountains of the SE where there are many known localities (but appears unrecorded in Bukhara province) and S, from the Nuratau Range (including the Aktau spur, e.g. Sarmysh Nature Park [40°19'N 65°39'E], S Navoi province; Martin et al. 2017) south through the Zerafshan and Gissar Ranges, into E Kashkadarya and Surkhandarya (Bannikov et al. 1977: map 58, Sindaco & Jeremcenco 2008: map 136). Recorded eastwards through Sirdarya and the Eastern provinces, including the Fergana Valley. The most northerly locality in Uzbekistan is along the valley of the River Pskem (Vashetko et al. 2003: Fig. 3 [approx. 41°50'N 70°18'E]) in NE Tashkent province (about 95 km NE of Tashkent city). Absent from Karakalpakstan and the Kyzylkum.

Altitudinal limits in Uzbekistan unclear, recorded at about 650 m (Sarmysh Nature Park, S Navoi; T. Martin pers. comm. 2018) up to an estimated 1,300 m asl (NE Tashkent province). In mountains of the Caucasus/C Asia reported up to 2,300 m (Szczerbak 2003).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2009).

**Ssp:** 2: nominate *P. a. apodus* in Uzbekistan.

**Remarks:** In the C Asian part of its range (i.e. S Kazakhstan, S Tajikistan and Uzbekistan), *P. apodus* inhabits moister habitats within otherwise semi-arid areas. It is associated with rivers and oases (Bogdanov 1986 in Telenchev et al. 2017), and wetlands were determined an important element in habitat preferences in Uzbekistan (Siroitchkosky 1958 in Telenchev et al. 2017). In Sarmysh Nature Park (S Navoi), observed in tall grass meadows in close proximity to streams (Martin et al. 2017), and in Tashkent province [translated from Russian] along irrigation ditches, and in river valleys, vegetable gardens and vineyards etc. (Vashetko et al 2003).



*Pseudopus apodus* (roadkill) near Sarmysh Nature Park, S Navoi province (Photo: Rémy Eudeline – RENECO - ECCH).

## Family Varanidae (Monitors)

- Desert monitor *Varanus griseus* (Daudin, 1803)

**Synonyms:** *Psammosaurus griseus*.

**Distribution in Uzbekistan:** An isolated locality on the southwest Aral Sea periphery (Bannikov et al. 1977: map 55 [approx. 43°55'N 58°20'E]) in Karakalpakstan may represent the most northerly record for the species. Otherwise scarce in Karakalpakstan where recorded at three localities south/southeast of the Aral Sea (Nuridjanov et al. 2016: Fig. 3) and in the south just east of Khorezm province (Bannikov et al. 1977). Occurs around the southern fringe of the Ustyurt in N Turkmenistan (Sindaco & Jeremčenko 2008: map 135), so perhaps in adjacent S Kungirov (Qo'n'irat) district (Karakalpakstan). Also documented for the N Kyzylkum in E Karakalpakstan between Nukus city and the Bukantau Mountains (Nuridjanov et al. 2016: Fig. 3 [approx. 42°34'N 61°43'E]); and in N Navoi, east and northeast of Uchkuduk city (42°N 64-65°E; Bannikov et al 1977, Martin et al. 2017). There are many documented localities further southeast through the Kyzylkum with numerous observations clustered around hills/low mountains (Nuridjanov et al. 2016), but also reflective of roads/tracks traversing the desert whereby surveys undertaken. Widespread in semi-desert and foothills of the Auminzatau and Kuldjuktai Mountains in C-N Bukhara and SW Navoi (39°N 63°E, 40°N 62-64°E; DS pers. obs. 2012-15). Local in SE, e.g. Karnabchul steppe (Martin et al. 2017) and foothills of the Nuratau Range (Nuridjanov et al. 2016). In S, widespread in Kashkadarya and Surkhandarya (Nuridjanov et al. 2016). In E almost lost or extirpated (Makayev 1982); formerly on the Dalverzinskaya steppe and in the Fergana Valley.

Altitudinal limits in Uzbekistan unclear; recorded from an estimated 80 m asl (Karakalpakstan) up to 490 m (Kuldjuktai; DS pers. obs. 2013). Elsewhere *V. g. caspius* has been recorded from 6 m bsl (NE Iran; Kami 2005) up to 800 m asl (Kopet Dagh).

**Red List Category:** Not yet assessed (IUCN 2018). Vulnerable, RDB of Uzbekistan (Azimov et al. 2009); declines attributed to agricultural development, human disturbance and death due to collision with traffic on roads.

**Ssp:** 3: *V. g. caspius* (Caspian desert monitor) in Uzbekistan.

**Remarks:** Although protected, subject to illegal hunting/killing as witnessed on a few occasions in the Kyzylkum (i.e. one being killed, pers. obs. 2012; one recently killed, J. Guilherme pers. comm. 2012; and two skinned carcasses hung to dry outside a shepherd's caravan, V. Terentyev pers. comm. 2013). This may be both for food for local consumption, and for sale of body parts for 'traditional medicinal use'.



*Varanus griseus* near Chantobay, SW Navoi province (Photo: David A. Showler).

## Family Lacertidae (Lacertid lizards)

- Steppe racerunner *Eremias arguta* (Pallas, 1771)

**Synonyms:** *Ommateremias arguta*, *Eremias (Ommateremias) arguta*. Recently placed in the subgenus *Eremias* by Orlova et al. (2017).

**Distribution in Uzbekistan:** Nominate *E. a. arguta* occurs in NW Karakalpakstan (primarily Ustyurt Plateau) west of the Amu Darya (Bannikov et al. 1977: map 75, Poyarkov Jr. et al. 2014: Fig. 1, Sindaco & Jeremčenko 2008: map 164). *E. a. uzbekistanica* is a submontane subspecies of foothills of the SE and S in the Nuratau and Zerafshan/Gissar Ranges, south to at least Kyzylcha village (Poyarkov Jr. et al. 2014), S Kashkadarya (38°17'N 66°13'E), approaching the southern-most extent of the species' distribution. Recorded a little further south in neighbouring extreme SE Turkmenistan (Sindaco & Jeremčenko 2008), thus perhaps present to the east/northeast in contiguous hills of N Surkhandarya (Uzbekistan). Recorded east to Tashkent province (Vashetko et al. 2003: Fig. 3, Poyarkov Jr. et al. 2014), but appears absent from (lowland) C/S Sirdarya, Namangan (possibly in Tien Shan foothills of northwest), Fergana and Andijan provinces (Bannikov et al. 1977, Poyarkov Jr. et al. 2014).

Note, *E. arguta* is indicated in some publications as present throughout the Kyzylkum where in fact it is probably absent (see Remarks).

Altitudinal limits unclear. *E. a. arguta* occurs in lowlands whilst *E. a. uzbekistanica* is found at higher elevations up to (very tentatively) an estimated 900 m asl (based on documented localities in Vashetko et al. 2003).

**Red List Category:** Populations relevant to Central Asia not yet assessed (IUCN 2018).

**Ssp:** 5-6 traditionally recognised. Taxonomy unresolved but five subspecies are tentatively proposed (based on preliminary phylogenetic results) by Poyarkov Jr. et al. (2014), who stress that morphological variability is so high that subspecies delimitation has always been problematic. Within Uzbekistan, *E. a. arguta* occurs in NW Karakalpakstan, and *E. a. uzbekistanica* in SE, S and E (in E, appears restricted to Tashkent province).

**Remarks:** *E. arguta* is mapped in Szczerbak (2003: map 44) and Ananjeva et al. (2006) as widespread in Uzbekistan, including throughout the Kyzylkum; it is acknowledged that these maps are very small scale, the latter especially so, and only designed to give a general indication of distribution. However, there appear no records from the Kyzylkum (e.g. not indicated as present by Bannikov et al. 1977, Sindaco & Jeremčenko 2008 or Poyarkov Jr. et al. 2014, and not recorded by DS, 2012-15). The closest known populations to the desert appear to be of *E. a. uzbekistanica* (the most distinct taxon within *E. arguta*) in foothills of the Nuratau Range around its southeastern periphery (Poyarkov Jr. et al. 2014).

- Reticulate racerunner *Eremias grammica* (Lichtenstein, 1823)

**Synonyms:** *Scapteira grammica*, *Eremias (Scapteira) grammica*.

**Distribution in Uzbekistan:** A psammophile, recorded from a few localities in Karakalpakstan (southern periphery of Aral Sea and Amu Darya deltaic plain) and Khorezm (Bannikov et al. 1977: map 73). Not documented as in the N Kyzylkum of Uzbekistan, although present in the north of the desert (to 44°N) in adjacent Kazakhstan (Sindaco & Jeremčenko 2008: map 161). Its main area of distribution within Uzbekistan appears to be the C-S Kyzylkum where widespread and common in some areas (DS pers. obs. 2012-15). In the desert observed from as far north as 42°N 64°E, east of Uchkuduk, C Navoi province (Martin et al. 2017) and through N/C Bukhara province (DS pers. obs. 2012-15), southeast to north of Navoi city, S Navoi (Martin et al. 2017), and around the Alat area and the Sundukli Sands. Also in S, in S Surkhandarya (Bannikov et al. 1977).

Altitudinal limits in Uzbekistan unclear but estimated at 60 m asl (Aral Sea coast) up to at least 400 m (S Surkhandarya).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.



*Eremias grammica* C-N Bukhara province (Photo: David A. Showler).



- Aralo-Caspian racerunner *Eremias intermedia* (Strauch, 1876)

**Synonyms:** *Eremias transcaspia*, *Ommateremias intermedia*, *Scapteira intermedia*. Recently placed in the subgenus *Eremias* (previously *Ommateremias* or *Scapteira*) by Orlova et al. (2017).

**Distribution in Uzbekistan:** Widespread in lowland desert/semi-desert, but absent from E. In Karakalpakstan recorded from the S Ustyurt in the Shakhpakhty area, Assake-Audan depression and Sarygamysh depression (Murzakhanov 2012), and the southern Aral Sea coast and Amu Darya deltaic plain (Bannikov et al. 1977: map 56, Sindaco & Jeremčenko 2008: 166). There appear to be no records from the N Kyzylkum, but fairly widespread in the C-S of the desert in Bukhara province (DS pers. obs. 2012-15; Sindaco & Jeremčenko 2008). Appears unrecorded from the Sundukli Sands of Uzbekistan but documented in adjacent Turkmenistan (Schammakov et al. 1993). Mapped in SE at two localities along the Zerafshan Darya near Bukhara city (Bukhara province), and in S at a few locations in Kashkadarya and Surkhandarya provinces (Bannikov et al. 1977).

Altitudinal limits unclear (in Uzbekistan and elsewhere) but estimated at 55 m asl (Aral Sea coast) up to 350 m (Surkhandarya).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.



*Eremias intermedia* C-N Bukhara province (Photo: David A. Showler).

- Striped racerunner *Eremias lineolata* (Nikolsky, 1897)

**Syn:** *Rhabderemias lineolata*, *Scapteira lineolata*. Placed in subgenus *Rhabderemias* by Orlova et al. (2017).

**Distribution in Uzbekistan:** Widespread (but few localities documented) in sandy desert/semi-desert from the Aral Sea south to S Surkhandarya; absent from E. Recorded around the southern Aral coast and through the Amu Darya deltaic plain of Karakalpakstan (Bannikov et al. 1977: map 70). In the N Kyzylkum, recorded from around Uchkuduk city, Navoi (Bannikov et al. 1977) and east of Uchkuduk (42°N 64°E; T. Martin pers. comm. 2018). Widespread in the C-S Kyzylkum (Sindaco & Jeremčenko 2008: map 171) where common throughout much of C-N Bukhara (40°N 62-64°E, 165-200 m asl; DS pers. obs. 2012-15), also between Zarafshan city and Lake Aydarkul, SE Navoi (Martin et al. 2017). Unreported from the Sundukli Sands within Uzbekistan but documented in adjacent Turkmenistan (Schammakov et al. 1993). In S, occurs in S Surkhandarya (Bannikov et al. 1977).

Altitudinal limits unclear but estimated at 60 m asl (S Aral Sea coast) up to at least 350 m (S Surkhandarya). In adjacent N Afghanistan recorded at 500 m asl (Wagner et al. 2016a).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Monotypic.



*Eremias lineolata* C-N Bukhara province (Photo: David A. Showler).

[?] Multi-ocellated racerunner *Eremias multiocellata* (Günther, 1872)

**Distribution:** Ananjeva et al. (2006) state that the Central Asian part of the distribution of *E. multiocellata* includes Uzbekistan, i.e. 'Montane and submontane regions of Tien Shan and Pamir-Altai in Kyrgyzstan, E and SE Kazakhstan and neighbouring Uzbekistan'. Two old records 'finds in the mountains', indicated as *E. multiocellata* are cited and mapped in Vashetko et al. 2003 (Fig. 2) in NE Tashkent province: (1) Chimgan

(Kashkarov 1924); and (2) Ak-Tahtay Pass (Korelov 1956). However, these records seem disregarded by other authorities, and no other reference could be found that indicate presence of *E. multiocellata* (or any member of the ‘*Eremias multiocellata* complex’) as occurring in Uzbekistan. Distribution is described as, for example:

(i) ‘northern China (S to Gansu, E to Liaoning) to Mongolia, Kyrgyzstan, Kazakhstan and Russia (Tuvin District)’ (Zhao 1999); (ii) ‘from Qilian Mountains (N China) to the NE China Plain to Mongolia, Kazakhstan and Kyrgyzstan’ (Yan et al. 2011); (iii) closest locations indicated by Szczerbak (2003) are of *E. m. stummeri* in Chu-Issyk-Kul basin (E Kyrgyzstan) and *E. m. szczerbaki* (both taxa now afforded species rank) in the Naryn River basin, C Kyrgyzstan; and (iv) ‘E Kazakhstan, N China, Mongolia and Tuva Republic of Russia’ (Sindaco & Jeremčenko 2008). Furthermore, Sindaco and Jeremčenko assert that data from other areas are erroneous and refer to other species in the *E. multiocellata* complex; no other member(s) of the complex occur in Uzbekistan.

Recently, the distribution of the ‘*Eremias multiocellata-przewalskii*’ complex has been mapped (Orlova et al. 2017: Fig. 1). Again, no representatives are indicated as in Uzbekistan, although three taxa have been recorded moderately close to the eastern border in W Kyrgyzstan: *E. stummeri* approx. 260 km NE (Kochkor) and *E. szczerbaki* approx. 200 km ENE (N of Naryn, Naryn district) of Namangen province; and *E. (multiocellata) yarkandensis* (recorded near Nura) approx. 140 km SE of the border with Andijan province.

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Taxonomy unresolved; see Orlova et al. (2017) for most recent synthesis.

**Remarks:** *E. multiocellata* is placed in the subgenus *Pareremias* by Orlova et al. (2017). The phylogenetic position of *E. (multiocellata) yarkandensis* (Orlova et al. 2017) supports species status (i.e. *E. yarkandensis*) as suggested by Eremchenko [=Jeremčenko] and Panfilov (1999).

- Black-ocellated racerunner *Eremias nigrocellata* Nikolsky, 1896

**Synonyms:** *Eremias intermedia* var. *nigrocellata*, *Eremias (Ommateremias) nigrocellata*. Recently placed in the subgenus *Eremias* by Orlova et al. (2017).

**Distribution:** Endemic to southern Central Asia. Known from a few localities in S Uzbekistan, SE Turkmenistan, SW Tajikistan and NE Afghanistan, with a separate population in NE Iran (Sindaco & Jeremčenko 2008, Šmíd et al. 2014, Wagner et al. 2016a).

**Distribution in Uzbekistan:** Restricted to S Surkhandarya (Azimov et al. 2009, Bannikov et al. 1977: map 71), where recorded ‘N Sherabad’ (E.A. Dunaev in Sindaco & Jeremčenko 2008). Within Uzbekistan, Turkmenistan and Tajikistan, recorded from 300 to 500 m asl (Ananjeva et al. 2017).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016). Vulnerable, RDB of Uzbekistan (Azimov et al. 2009); numbers are considered to have sharply declined due to conversion of desert to agricultural land, ploughing and irrigation considered particularly damaging.

**Ssp:** Monotypic.

**Remarks:** *E. nigrocellata* is closely related and very similar in appearance to *E. intermedia*, with which some authors have considered *perhaps* conspecific (e.g. Anderson 1999), but now generally accepted as a valid species (e.g. Orlova et al. 2017).

Little information was located regards *E. nigrocellata* in Uzbekistan. In N Afghanistan, it has been recorded on firm clay or loess substrates with sparse vegetation (Clark 1990), and habitat is similarly described as hard, mainly loess, soils (occasionally containing sand or gravel) characterized by ephemeral vegetation cover (Anderson 1999).

- Kyrgyz racerunner *Eremias nikolskii* Nikolsky, 1905

**Synonyms:** *Eremias multiocellata*, *Eremias velox* (part), *Eremias (Dimorphea) nikolskii*. Recently placed in the subgenus *Aspidorhinus* by Orlova et al. (2017).

**Distribution:** Endemic to mountains of the W Tien Shan and N Pamir-Alai (Turkestan, Alai and Fergana Ranges) around the Fergana Valley of E Uzbekistan, N Tajikistan and Kyrgyzstan (Szczerbak 2003, Sindaco & Jeremčenko 2008).

**Distribution in Uzbekistan:** Although said to be confined to Fergana district [in S Fergana province] (Szczerbak 2003), in E Tashkent and NW Namangan provinces (W Tien Shan) three localities are mapped (approx. 75 km ESE to 90 km E of Tashkent city) and ‘named/described’ in Vashetko et al. 2003 (Fig. 2): [translated from Russian] (1) mountainous part of the River Angren [west of river at approx. 41°15’N 70°07’E, NW Namangan province]; (2) mouth of the River Ertash (a tributary of the Angren) to Kamchik Pass [approx. 41°02’N 70°17’E, E Tashkent province]; and (3) Reval Kamchik (Kamchik Pass) [approx. 41°11’N 70°34’E, NW Namangan].

Within the Tien Shan of Uzbekistan, it inhabits river valleys and gorges from 1,000 to 3,000 m asl (Vashetko et al. 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** Monotypic.

**Remarks:** Author of species description is given as Bedriaga, i.e. '*Eremias nikolskii* Bedriaga, 1905', in some publications (e.g. Szczerbak 2003, Sindaco & Jeremčenko 2008).

- Tajik racerunner *Eremias regeli* Nikolsky, 1905

**Synonyms:** *Eremias bedriagai*, *Eremias (Dimorphea) regeli*. Recently placed in the subgenus *Aspidorhinus* by Orlova et al. (2017).

**Distribution:** Endemic to southern Central Asia and Afghanistan. Restricted to small areas of S Uzbekistan, extreme SE Turkmenistan, SW Tajikistan and N and E Afghanistan (Szczerbak 2003, Ananjeva et al. 2006, Wagner et al. 2016a; see also Remarks).

**Distribution in Uzbekistan:** *E. regeli* appears restricted to Surkhandarya province (Bannikov et al. 1977: map 72). The type locality is 'Shirabad', SW Surkhandarya. Shirabad (Sherabad) town is located at 37°40'N 67°00'E. Little information was located regarding distribution (and the species in general) in Uzbekistan.

In Central Asia, habitat is described as arid ravines and precipices in foothills (Szczerbak 2003); altitudinal limits are unclear but Shirabad lies at about 412 m asl, and within a 10 km radius, arid hills on its northwestern periphery rise to about 770 m.

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** Monotypic.

**Remarks:** Author of species description variably cited as: 'Nikolsky, 1905' (e.g. Uetz & Hošek 2017); 'Bedriaga, 1905' (e.g. Sindaco & Jeremčenko 2008); and 'Bedriaga in Nikolsky, 1905' (e.g. Ananjeva et al. 2006).

Distribution is described as 'extreme E Turkmenistan, SW Tajikistan and N Afghanistan' with two isolated records in E Afghanistan (i.e. Uzbekistan not mentioned) by Sindaco and Jeremčenko (2008). Baig and Masroor (2006: Fig. 4) indicate a locality in N Afghanistan and describe distribution as 'N Afghanistan, Uzbekistan and Tajikistan' (presumably derived from Szczerbak 1974).

- Sand racerunner *Eremias scripta* (Strauch, 1867)

**Synonyms:** *Eremias ladzini*, *Rhabderemias scripta*, *Scapteira scripta*. Placed in subgenus *Rhabderemias* (previously *Rhabderemias* or *Scapteira*) by Orlova et al. (2017).

**Distribution in Uzbekistan:** Three subspecies occur. *E. s. scripta* is widespread in sand desert of Karakalpakstan south through the Kyzylkum. In Karakalpakstan, reported from the Shakhpakhty area and Sarygamysh depression S Kungirov (Qo'n'irat) district (Murzakhanov 2012), south of the Aral Sea and through the Amu Darya deltaic plain (Bannikov et al. 1977: map 67). In the Kyzylkum recorded as far north as the Uchkuduk area, N Navoi (T. Martin pers. comm. 2018: dunes approx. 65 km NE of Uchkuduk city, 42°26'N 64°13'E). Further south, most records are from about Alat (SW Bukhara province; Bannikov et al. 1977), east to dunes 35-45 km SSW of Lake Ayakagytm (40°15'N 64°18'E, 220 m asl; DS pers. obs. 2013) and SE Navoi (40°53'N 65°05'; T. Martin pers. comm. 2017). No records were located from the Sundukli Sands in Uzbekistan but documented in adjacent Turkmenistan (Schammakov et al. 1993).

Two disjunct populations are present: (i) in S Surkhandarya, presumably referable to *E. s. lasdini* (see Remarks); and (ii) *E. s. pherganensis* endemic to the Fergana Valley of N Tajikistan and Uzbekistan (Shcherbak [=Szczerbak] & Vashetko 1973; Nazarov et al. 2016). Within the Uzbekistan-part of the Fergana Valley, there are scattered localities through W and N Fergana province, and adjacent S Namangan (Nazarov et al. 2016: Fig. 5).

Altitudinal limits of *E. s. scripta* in Uzbekistan are estimated at 50 m asl (Aral Sea coast), up to at least 295 m (N Navoi province; T. Martin pers. comm. 2017). Both *lasdini* and *pherganensis* reach slightly higher elevations.

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016). *E. s. pherganensis*: Endangered, RDB of Uzbekistan (Azimov et al. 2009); extirpated from most former areas due to habitat degradation/loss associated with agricultural development (ploughing and irrigation considered particularly damaging).

**Ssp:** 3; all occur in Uzbekistan: (i) nominate *E. s. scripta* over most of range, i.e. Turkmenistan, Kazakhstan, NE Iran, S Afghanistan, Pakistan (Szczerbak 2003, Wagner et al. 2016a) and presumably likewise Uzbekistan (i.e. Karakalpakstan and the Kyzylkum); (ii) *E. s. lasdini* in SE Uzbekistan and SW Tajikistan (Szczerbak 2003) and 'probably adjoining N Afghanistan' (Sindaco & Jeremčenko 2008) but note, species as a whole (and referring to nominate) is only indicated as in S Afghanistan by Wagner et al. (2016a); and (iii) *E. s. pherganensis* endemic to the Fergana Valley.

**Remarks:** The distribution of *E. s. lasdini* is described as 'southeastern Uzbekistan and southwestern Tajikistan' (Szczerbak 2003), similarly in several subsequent publications. This presumably refers, in Uzbekistan, to the disjunct population in S Surkhandarya (and adjacent SW Tajikistan).



*Eremias scripta* E Bukhara province (Photo: David A. Showler).

- Rapid racerunner *Eremias velox* (Pallas, 1771)

**Synonyms:** *Eremias (Aspidorhinus) velox*; retained in subgenus *Aspidorhinus* by Orlova et al. (2017).  
**Distribution in Uzbekistan:** Widespread around the Aral Sea periphery, on the Amu Darya deltaic plain and along the river valley (Bannikov et al. 1977: map 66). Mostly absent from the Ustyurt Plateau but in S Ustyurt reported from the Shakhpakhty area, Assake-Audan depression and Sarygamysh depression, Kungiro (Qo'n'irat) district (Murzakhanov 2012). Few records from the N Kyzylkum (recorded north to 41°N 64°E; Sindaco & Jeremčenko 2008: map 162) but fairly widespread in scrub semi-desert (including vegetated takyrs) of the C Kyzylkum (DS pers. obs. 2012-15, Martin et al. 2017). Appears unrecorded from the Sundukli Sands within Uzbekistan but documented in adjacent Turkmenistan (Schammakov et al. 1993). Also present in S (south to S Surkhandarya) and through SE and E (Bannikov et al. 1977, Sindaco & Jeremčenko 2008, Vashetko et al. 2003: Fig. 4).

Altitudinal limits in Uzbekistan uncertain but estimated to occur at least as low as 50 m asl (Aral Sea area) and up to 720 m, probably higher (in E); in mountainous regions it inhabits mostly foothills and river valleys (Szczerbak 2003, Vashetko et al. 2003). Within Central Asia recorded up to 1,700 m asl (Szczerbak 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 4 (but see Remarks): nominate in Uzbekistan.

**Remarks:** Although four subspecies are traditionally recognised, *E. velox* is increasingly accepted as a species complex across its entire range (N Caucasus, Central Asia including N Iran and N Afghanistan, east to NW China) based on morphological and molecular systematics (Liu et al. 2014).



*Eremias velox* Jeyran Ecocenter Reserve, S Bukhara province (left), and SW Navoi province (Photos: David A. Showler).

## Suborder Serpentes (Snakes)

### Family Typhlopidae (Worm or blind snakes)

**Genus *Xerotyphlops*:** Following a taxonomic review of typhlopoid snakes (Hedges et al. 2014), four Eurasian species previously *Typhlops* (*T. etheridgei*, *luristanicus*, *vermicularis* and *wilsoni*) and *T. socotranus* (Socotra) were assigned to the new genus *Xerotyphlops*.

- Eurasian blind snake *Xerotyphlops vermicularis* (Merrem, 1820)

**Synonyms:** *Typhlops flavescens*, *Typhlops persicus*, *Typhlops vermicularis*.

**Distribution:** SE Balkans, E Mediterranean/SW Asia east to Central Asia. In Central Asia, known from foothills and mountains of S and W Turkmenistan, S Uzbekistan, N Iran, N and C Afghanistan, and Tajikistan (Sindaco et al. 2013, Wagner et al. 2016a).

**Distribution in Uzbekistan:** Poorly known. Recorded from the Gissar Range in Surkhandarya province, possibly also occurs further north (Bannikov et al. 1977: map 91).

Altitudinal limits in Uzbekistan uncertain, in Central Asia found up to 1,700 m asl (Szczerbak 2003).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Usually considered monotypic although populations from some regions may warrant subspecies or species recognition (Hedges et al. 2014).

**Remarks:** Inhabits arid and semi-arid foothills and dry rocky mountain slopes with xerophytic vegetation, within which it appears to occupy damp microhabitats. Ananjeva et al. (2006) highlight this, indicating that in Tajikistan mostly recorded in moist areas of montane slopes with some grassy vegetation, also in open juniper woodland and foothills with brush thickets; in Kopet Dagh (Turkmenistan, NE Iran) most common in intermountain depressions and on rocky slopes with sparse grass cover, also in upland steppe.

## Family Boidae (Sand boas)

**Genus *Eryx*:** In Uzbekistan, the two widespread nominate forms of the taxonomically unresolved Central Asian '*Eryx miliaris-tataricus* complex' occur, desert sand boa *E. m. miliaris* and Tatar sand boa *E. t. tataricus*. Sometimes treated as one species, a phylogenetic study (Pyron et al. 2013) recognises *E. miliaris* and *E. tataricus* as separate but very closely related taxa (as previously treated by many authorities). Other members of the complex (species or subspecies, taxonomy dependent) in the Central Asian region are known from very restricted areas and one of these, *E. t. vittatus* (sometimes treated as a species), may occur in S Uzbekistan.

- Desert sand boa *Eryx miliaris* (Pallas, 1773)

**Synonyms:** *Eryx jaculus miliaris*, *Eryx rickmersi*.

**Distribution in Uzbekistan:** Primarily a sand desert species. In Karakalpakstan widespread around the periphery of the Ustyurt Plateau, in S Ustyurt reported from Shakhpakhty area and the Sarykamysh depression, Kungirov (Qo'n'irat) district (Murzakhanov 2012); also in the Aral Sea coastal region and on the Amu Darya deltaic plain (Bannikov et al. 1977, map 92). Not confirmed in the N Kyzylkum within Uzbekistan although there is a 'vague' record (i.e. requiring confirmation) from N Navoi province, 42°N 64°E (Sindaco et al. 2013: map 22) but present in adjacent Kazakhstan (44°N 64°E; Sindaco et al. 2013). In the C-S Kyzylkum widespread in Bukhara province (39°N 63-64°E; Sindaco et al. 2013, and 40°N 63-64°E; DS pers. obs. 2012-15) and in S Navoi observed between Zarafshan city and Lake Aydarkul (Martin et al. 2017). Local in SE (east to at least S Navoi province), and south to the Sundukli Sands, NW Kashkadarya (Bannikov et al. 1977). Absent from E.

Altitudinal limits within Uzbekistan uncertain but recorded in desert/semi-desert from an estimated 55 m asl (Aral Sea coast) up to at least 220 m (C Kyzylkum; DS pers. obs. 2015). Within Central Asia occurs up to about 1,000 m (Ananjeva et al. 2006).

**IUCN Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 2: nominate in Uzbekistan.

**Remarks:** Given very likely extensive suitable habitat, *E. miliaris* probably occurs much more widely in the Kyzylkum than presently documented.



*Eryx miliaris* C-N Bukhara province (Photo: David A. Showler).

- Tatar sand boa *Eryx tataricus* (Lichtenstein, 1823)

**Synonyms:** *Eryx miliaris tataricus*.

**Distribution in Uzbekistan:** More of an earthy/steppe-desert species (usually found on clay and loess soils with sparse vegetation; Vashetko et al. 2003) than *E. miliaris*. Recorded in NW Karakalpakstan west of the Amu Darya delta, but no records from the Amu Darya deltaic plain or river valley itself (Bannikov et al. 1977: map 94). There is a 'vague' record (i.e. requiring confirmation) from N Navoi province in the N Kyzylkum (42°N 64°E; Sindaco et al. 2013: map 24). Otherwise absent from most of the Kyzylkum and appearing restricted to its southeastern

periphery (S Navoi, N Samarkand and N Jizzakh provinces). Also found through SE (e.g. Karnabchul steppe; Martin et al. 2017), S and E Uzbekistan (Bannikov et al. 1977, Sindaco et al. 2013, Vashetko et al. 2003).

Altitudinal limits within Uzbekistan uncertain; in C Asian mountains recorded up to 1,600 m (Ananjeva et al. 2006).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 1 to 3 (see Remarks): nominate in Uzbekistan.

**Remarks:** *Eryx t. vittatus*, sometimes considered a species (*Eryx vittatus*), is known from a very limited area of SW Tajikistan in the Gissar Valley and Mountains (Sindaco et al. 2013), and possibly the Kugitang Range, Turkmenistan (Ananjeva et al. 2006) to the west. Given this, it might be expected in the Gissar/Kugitang in between in N Surkhandarya and/or S Kashkadarya provinces, S Uzbekistan.



*Eryx tataricus* Karnabchul steppe, S Navoi province (Photo: Nicolas Orhant – RENECO - ECCH).

### Family Colubridae (Typical snakes)

- Gamma snake *Boiga trigonata* (Schneider, 1802)

**Synonyms:** for *Boiga trigonata melanocephala* (ssp. in Uzbekistan): *Boiga trigonata* var. *melanocephala*, *Boiga melanocephala*.

**Distribution in Uzbekistan:** *B. t. melanocephala* (black-headed gamma snake), the subspecies present, appears confirmed only in S Surkhandarya province (Azimov 2009, Bannikov et al. 1977: map 130). It probably reaches northern limits of distribution in NW Turkmenistan (40°N 57°E; Sindaco et al. 2013: map 30) but an unconfirmed locality lies further north in isolation in the N Kyzylkum in the Mingbulak depression, N Navoi province (Azimov et al. 2009). Within this area it was indicated as in desert around Aksay Lake (42°05'N 63°00'E, approx. 50 km W of Uchkuduk city) by Kaskarov et al. (2008), but this subsequently removed in an updated account (BirdLife 2018b). Ananjeva et al. (2006), stating that 'the most northern record is from the Kyzylkum in Uzbekistan', are perhaps referring to Mingbulak, but Bannikov et al. (1977), Szczerbak (2003) nor Sindaco et al. (2013) indicate presence here, and the origin of this record could not be located. Given secretive habits of *B. t. melanocephala*, known proximity of occurrence on the west-side of the Amu Darya valley [approx. 39°13'N 63°42'E, 185 m asl] just NW of Türkmenabat and in the 'Sundukli complex' [i.e. east side of the river] in Turkmenistan (Schammakov et al. 1993), and that there also appears suitable habitat, it might be expected in the vicinity in adjacent Uzbekistan, perhaps most likely in well-vegetated areas along the Amu Darya fringing the southern part of the Kyzylkum. Additionally, in a biodiversity action plan (LUKOIL 2012) '*Boiga trigonatum* tree snake', is indicated as occurring around Dengizkul Lake (S Bukhara province) that lies at the northern end of the Sundukli Sands, but the source of this information is not cited.

Altitudinal limits within Uzbekistan uncertain. Within its range, *B. t. melanocephala* is known from lowlands (sea level) up to (in NE Iran) 1,120 m asl (Yousefkhani et al. 2014).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2009). Vulnerable, RDB of Uzbekistan (Azimov et al. 2009); in its restricted area of occurrence (S Surkhandarya) it has always been considered rare and local.

**Ssp:** 2: *B. t. melanocephala* in Uzbekistan.

**Remarks:** *B. t. melanocephala* is treated as a species by some authorities (e.g. Khan 2004).

It inhabits earthy and sandy desert, and river valleys and rocky hills with xerophytic grass and trees (Szczerbak 2003). Said to prefer sand dunes with areas of arid scrub, e.g. *Callogonium* [*Calligonum*] bushes and sparse grassy vegetation, clayish and sandy deserts, also on takyr-like [clay] soils with sagebrush *Artemisia* and glasswort [saltwort] *Salsola* (Ananjeva et al. 2006).

- Steppe snake *Elaphe dione* (Pallas, 1773)

**Synonyms:** *Coluber dione*.

**Distribution in Uzbekistan:** Widespread but absent from sand desert (including most of the Kyzylkum). In the northwest (Karakalpakstan), recorded on the Ustyurt Plateau and Amu Darya plain (Bannikov et al. 1977: map 110, Sindaco et al. 2013: map 52). Absent from most of the Kyzylkum but recorded in the north in N Navoi province (42°N 62°E; Sindaco et al. 2013). Widespread in foothills and mountains of SE, S (e.g. Zerafshan Range, D. Farrow pers. obs. 2000) and E (Bannikov et al. 1977, Sindaco et al. 2013, Vashetko et al. 2003: Fig. 6).

Altitudinal limits within Uzbekistan uncertain but estimated up to at least 1,500 m asl (Tashkent province).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016).

**Ssp:** Usually considered monotypic.



*Elaphe dione* Zerafshan Range, Samarkand province (Photo: David S. Farrow).

- Blotched snake *Elaphe sauromates* (Pallas, 1811)

**Synonyms:** *Elaphe quatuorlineatus sauromates*

**Distribution:** Mainly SE Europe and West Asia. In Central Asia restricted to W Kazakhstan, extreme NW Turkmenistan and NW Uzbekistan (Ananjeva et al. 2006, Böhme & Shcherbak 1999).

**Distribution in Uzbekistan:** Known only from W and N Karakalpakstan, where recorded on the Ustyurt Plateau Kungirov (Qo'n'irat) district in 1° square 44°N 57°E (Sindaco et al. 2013: map 54), and in the S Ustyurt in the Shakhpakhty area [approx. 42°40'N 56°20'E] and Assake-Auden depression (Murzakhanov 2012). Also (formerly at least) on Vozrozhdenie island (Muynak district) in the Aral Sea (Azimov et al. 2009, Bannikov et al. 1977: map 109 '*Elaphe quatuorlineata*').

Altitudinal limits within Uzbekistan (estimated from areas where reported) lie between 40 to 200 m asl.

**Red List Category:** Least Concern (IUCN 2108; last assessed 2106). Vulnerable, RDB Uzbekistan (Azimov et al. 2009); in Uzbekistan considered naturally rare, threats include 'agricultural development of virgin lands and extermination by humans'.

**Ssp:** Monotypic.

**Remarks:** Publication year of author description sometimes dated '1814' i.e. '(Pallas, 1814)'.

Habitat in the central Ustyurt is described as stabilised sands with saxaul *Haloxylon*, in clayish desert and solonchaks (Ananjeva et al. 2006), and in the southern Ustyurt, shrub saxaul desert and dwarf semi-shrub desert (Murzakhanov 2012).

**Genus Hemorrhoids:** *Hemorrhoids* is now separated as an old-world genus (Schätti & Utiger 2001, Nagy et al. 2004) from *Coluber* (*Coluber* now restricted to American species).

- Coin-marked snake *Hemorrhoids nummifer* (Reuss, 1834)

**Synonyms:** *Coluber nummifer*, *Coluber ravergieri chernovi*, *Coluber ravergieri nummifer*.

**Distribution:** E Mediterranean south to NE Egypt, through S Turkey east to W Iran; disjunctly further east in NE Iran, Turkmenistan, Uzbekistan and S Kazakhstan.

**Distribution in Uzbekistan:** Distribution unclear, partly as only widely recognised as a species (separated from *H. ravergieri*) post-1985 (see Remarks) but also extensive zones of sympatry with *H. ravergieri* in Central Asia (Ananjeva et al. 2006) make it difficult to infer range from older accounts/maps unless validated by specimens. Locations in Bannikov et al. 1977 (map 117 '*Coluber ravergieri*') refer to both *H. nummifer* and *ravergieri*. *H. nummifer* appears perhaps mostly to occur in a zone along the Zerafshan Darya from the Alat area (Bukhara province), eastwards to W Tashkent province (Aghasyan et al. 2017; distribution mapped on IUCN database). Although mapped as present in C/E Tashkent (Aghasyan et al. 2017), not indicated in this area by Vashetko et al. (2003).

Not directly mentioned or mapped as in Uzbekistan by Sindaco et al. 2013 (map 53); the two mapped 1° squares on the W-border area refer to two localities in Turkmenistan (Tuniyev et al. 1997: Fig.1), the one in the north (41°N 59°E) refers to just south of 'Tashauz' [Dashoguz city; approx 41°50'N 59°57'E] about 10 km from the Uzbekistan border (N Khorezm), and the one in the SE (39°N 66°E) to 'Kugitang Mountains, Svintzovy Rudnik' [approx. 37°42'N 66°20'E; E of Govuduk town] very close to the Uzbek border, adjacent to W Surkhandarya. A locality mapped just east of the Amu Darya [approx. 40°45'N 62°15'E, 150 m asl] in SE Khorezm (Bannikov et al. 1977) may refer to *H. nummifer* or *ravergieri*.

Altitudinal limits within Uzbekistan uncertain. Said to be a relatively more lowland species than *H. ravergieri* (Ananjeva et al. 2006). Through its entire area of distribution, altitudinal range is given as 800 to 2,000 m by Aghasyan et al. (2017). However, in the E Mediterranean it appears recorded down to almost sea level, e.g. on Simi island (Greece), where relatively common (Wilson & Grillitsch 2009), observed as low as 25 m asl (Ilias Strachinis 2007: en.balanica.info). In N Turkmenistan a locality documented for the species, i.e. south of 'Tashauz' (Tuniyev et al. 1997) close to the border with N Khorezm, lies probably at about 90 m asl (within a 25 km radius the terrain does not exceed 120 m); the closest area with moderately high elevation is Sultanuzdag (rising to 473 m asl) located approximately 30 km to the northeast in S Karakalpakstan.

**Red List Category:** Least Concern (IUCN 2108; last assessed 2106).

**Subspecies:** Monotypic.

**Remarks:** Previously considered a subspecies or synonym of *Coluber (Hemorrhois) ravergieri*. Schätti and Agasian, 1985 (in Szczerbak 2003) in their analysis of the *C. ravergieri* - *nummifer* complex, concluded that *nummifer* is a distinct species (morphologically and ecologically separate from *ravergieri*), supported by subsequent studies (e.g. Nagy et al. 2004).

In Turkmenistan, *H. nummifer* is reported as occurring in drier habitats than *ravergieri*, but although it can tolerate temporary drying-up of riparian habitat, it is not found in waterless regions as are true desert snakes (Tuniyev et al. 1997). Habitat in Central Asia is described as stony slopes and rocks overgrown with bush vegetation, thickets along banks of rivers, and xerophytic habitats in ravines (Ananjeva et al. 2006), i.e. broadly the same as that occupied by *H. ravergieri*.

- Spotted whip snake *Hemorrhois ravergieri* (Ménétries, 1832)

**Synonyms:** *Zamenis ravergieri*, *Coluber ravergieri*. Note: *Hemorrhois (Coluber) r. cernovi*, often cited as a ssp., is a synonym of *H. nummifer*.

**Distribution in Uzbekistan:** Widespread (but absent from the Ustyurt Plateau and very local in the Kyzylkum), mainly in hills and mountains of S, SE and E (Sindaco et al. 2013: map 59; Vashetko et al. 2003: Fig. 6 '*Coluber ravergieri*'). Some locations in Bannikov et al. (1977: map 117) refer to *H. nummifer* (previously often considered a ssp. of *ravergieri*). Those records mapped around the west shore of, and on islands in, the Aral Sea Karakalpakstan (approaching N-limits of species range) probably refer to *H. ravergieri* (as mapped also in the N Aral area by Sindaco et al. 2013). A locality in the N Kyzylkum in the Bukantau Mountains area, N Navoi province (Bannikov et al. 1977) is also likely attributable to *H. ravergieri*, although not mapped as present in the Kyzylkum by Sindaco et al. (2013). However, recently observed in the C (2013) and S (2011) Kyzylkum: (i) in the Kuldjuktai Mountains (40°46'N 63°47'E, 480-495 m asl) on the Bukhara-Navoi border (DS pers. obs. 2013), and (ii) south of the Tamditau Mountains (41°10'N 64°51'E, 250 m asl) in SE Navoi (Martin et al. 2017; see also: Remarks).

In Uzbekistan confirmed from at least as low as 250 m asl in the SE Kyzylkum (Martin et al. 2017). In adjacent Turkmenistan also recorded at low elevations (Tuniyev et al. 1997), e.g. west bank of the Amu Darya close to the Uzbekistan border near Türkmenabat city that lies at about 190 m a.s.l., and Khatab (Hatab) village [37°37'45"N 65°31'34"E] at around 251 m asl. In mountains of Central Asia recorded up to about 2,600 m (Szczerbak 2003).

**Red List Category:** Least Concern (IUCN 2108; last assessed 2106).

**Ssp:** Monotypic.

**Remarks:** In the Kyzylkum *H. ravergieri* appears to have a relict distribution confined to some hills/mountains and adjacent areas, but distribution is unclear. In May 2011, one was observed south of the Tamditau (Martin et al. 2017) in the SE Kyzylkum, and in May 2013, three in the Kuldjuktai (DS pers. obs. 2013) in the C Kyzylkum (all individuals were black-headed colour morphs). *H. ravergieri* is not mapped in these areas by Bannikov et al. (1977) nor Sindaco et al. (2013). Within the Kyzylkum, proximity to uplands is perhaps the main factor governing distribution, but that they may disperse along rivers into the desert zone (Tuniyev et al. 1997) might account for lowland records close to the Amu Darya.





*Hemorrhhois ravergieri* near Bukhara, a wild-caught captive, capture locality uncertain (Photo: Mark Pestov).

- Northern wolf snake *Lycodon striatus* (Shaw, 1802)

**Synonyms:** *Ophites striatus*.

**Distribution in Uzbekistan:** Local in SE (Turkestan Ugam and Nuratau Ranges) and S (Zerafshan Range to S Surkhandarya; Azimov et al. 2009). Also in E, local on plains and foothills (mainly clay desert takyrs and foothills with sparse vegetation cover) of Tashkent province (Azimov et al. 2009, Vashetko et al. 2003: Fig.1).

Altitudinal limits within Uzbekistan uncertain. Through C Asian range said to occur (in arid rocky areas with sparse vegetation cover) up to about 1,800 m (Szczerbak 2003).

**Red List Category:** Not yet assessed (IUCN 2018). Vulnerable, RDB of Uzbekistan (Azimov et al. 2009); considered naturally rare in Uzbekistan, threats to populations include agricultural development of virgin lands.

**Ssp:** 3: *L. s. bicolor* in Uzbekistan.

**Remarks:** Little information specific to Uzbekistan could be located regarding *L. striatus*.

- Afghan awl-headed snake *Lytorhynchus ridgewayi* Boulenger, 1887

**Synonyms:** *Lytorhynchus gabrielis*.

**Distribution in Uzbekistan:** Distribution unclear, in part as the species is difficult to detect as semi-fossorial and nocturnal (see also Remarks). Local in the N-C Kyzylkum (N-limits of distribution), where recorded in the Bukantau Mountains (N Navoi province); also 'Aitymtau', a low mountain in the C Kyzylkum (Ananjeva et al. 2006). Reported as in the S Kyzylkum around Dengizkul Lake and just beyond the desert in the Jeyran Ecocenter reserve (Kashkarov 2008), S Bukhara province. Also S/SE Uzbekistan (Ananjeva et al. 2006, Bondarenko 1990, Szczerbak 2003) where known from about 20 km SW of Navoi city (Navoi province), and the Kugitang Range and Sherabad district, Surkhandarya (Azimov et al. 2009). Distribution in Uzbekistan simply described as 'S Uzbekistan' (Sindaco et al. 2013); in Uzbekistan (and/or opposite bank of the Amu Darya, i.e. west bank in Turkmenistan) presence only mapped (map 70) in a single 1° square (39°N 63°E) by Sindaco et al. (2013). The only locality in Bannikov et al. 1977 (map 122) in this square lies on the Turkmenistan side of the river, and in fact no localities are mapped in Uzbekistan by Bannikov et al. (1977).

Altitudinal limits in Uzbekistan uncertain. Within Central Asia recorded up to 2,000 m asl (Szczerbak 2003).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2016). Vulnerable, RDB of Uzbekistan (Azimov et al. 2009); declines are attributed to habitat loss due to agricultural development.

**Ssp:** Monotypic.

**Remarks:** Ananjeva et al. (2006) suggest that *L. ridgewayi* may occur in other low mountain massifs (in addition to Bukantau and Aitymtau) between the Amu Darya and Syr Darya.

**Genus *Platyiceps*:** Previously within *Coluber* (*Coluber* now restricted to American spp.), *Platyiceps* is now separated as an old-world genus (Nagy et al. 2004, Schätti & Utiger 2001).

- Spotted desert racer *Platyiceps karelini* (Brandt, 1838)

**Synonyms:** *Coluber karelini*, *Coluber karelinii*, *Zamenis karelini*.

**Distribution in Uzbekistan:** Very widespread (Bannikov et al 1977: map 114, Sindaco et al. 2013: map 81), inhabiting desert/semi-desert and foothills. However, appears absent from the Ustyurt Plateau (Karakalpakstan) although recorded around its southeastern periphery in the Sarykamysh depression, S Kungirov (Qo'n'irat) district (Murzakhanov 2012). Also absent from the eastern Fergana Valley (Schätti et al. 2014), and only known from one locality in Tashkent province, approximately 70 km NE of Tashkent city (Vashetko et al. 2003: Fig. 1). There are few records from the Kyzylkum where undoubtedly under-recorded, e.g. fairly recently observed in C-N

Bukhara province (40°N 63°E, 185m asl; DS pers. obs. 2012; M. Koshkin pers. obs. 2013) and SE Navoi province between Zarafshan city and Lake Aydarkul (Martin et al. 2017).

Altitudinal limits are estimated as from 50 m asl (S Aral area), and recorded up to 1,200 m (NE Tashkent; Vashetko et al. 2003). Within Central Asia, recorded from lowlands up to about 1,800 m asl (Szczerbak 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 2: nominate *P. k. karelini* (Karelin's racer) in Uzbekistan.

**Remarks:** *P. k. karelini* is known to hybridise in some areas with *P. r. rhodorachis*, and hybridisation is considered probably to occur in Uzbekistan (Schätti et al. 2014).



*Platyceps karelini* C-N Bukhara province (Photo: David A. Showler).

- Cliff racer *Platyceps rhodorachis* (Jan, 1865)

**Synonyms:** *Coluber rhodorachis*.

**Distribution in Uzbekistan:** Widespread in SE, eastwards from about Bukhara city [approx. 39°50'N64°20'E], through SE Navoi (e.g. Karnabchul steppe; Martin et al. 2017), Samarkand, Jizzakh and Tashkent provinces (Bannikov et al. 1977: map 115, Schätti et al. 2014: Fig. 9, Vashetko et al. 2003: Fig. 3), with an isolated record in the Fergana Valley, Andijan province (Jadgarov et al. 1988, Schätti et al. 2014). Although recorded in Jizzakh and Tashkent provinces, not confirmed from Sirdarya in between (Schätti et al. 2014). Also present in S, where widespread in Surkhandarya (Bannikov et al. 1977, Schätti et al. 2014). Further north, status unclear. Schätti et al. (2014) state 'documented for central Quljuqtov Tog'lari (Kuldzhuktau)' [= Kuldjuktai Mountains, approx. 40°48'N 63°42'E, SW Navoi province], and indicted as a 'collecting site', but the source is not cited. Not mapped as in the Kuldjuktai by Bannikov et al. (1977) or Sindaco et al. (2013: map 84). Sindaco et al. (2013) do however, indicate a 'vague' (i.e. unconfirmed) record further north (42°N 64°E) in N Navoi. Thus presence of *P. rhodorachis* in the C and N Kyzylkum seems uncertain, but local populations may occur (and bearing in mind *H. ravergeri* only recently recorded in the Kuldjuktai). Also in Karakalpakstan in the Sarykamysh depression, S Kungirov (Qo'n'irat) district (Murzakhanov 2012); documented in the depression in Turkmenistan (Rustamova & Shammakov 1982) and S Ustyurt (Bannikov et al. 1977).

Altitudinal limits in Uzbekistan unclear. Estimated from about 220 m (Bukhara area), and recorded up to 1,300-1,400 m asl (Tashkent province; Vashetko et al. 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** Generally considered 2-4 (but taxonomy unresolved): nominate *P. r. rhodorachis* (common cliff racer) in Uzbekistan (see also Remarks).

**Remarks:** Taxonomy complex, a full revision needed (Wagner et al. 2016a). In the present checklist, Schätti et al. (2014) is followed, i.e. *P. r. rhodorachis* is considered to occupy most of the species' distribution range, including Uzbekistan. This is contra to e.g. Szczerbak (2003), where *Coluber* [= *Platyceps*] *r. rhodorachis* is said to be confined to S Turkmenistan with *P. r. ladacensis* (Ladakh cliff racer) occupying the rest of its range. Likewise, Sindaco et al. (2013) state *ladacensis* as over most of Central Asia (also Afghanistan, Iran and Pakistan). Schätti et al. (2014) consider *P. r. ladacensis* as only confirmed from the eastern Hindu Kush into northern Himachal Pradesh (India), and indicate its taxonomic status as debatable (elevated to species by some authorities, others not considering it warranting even ssp. status).

In Appendix B 'Examined hybrid racers' (Schätti et al. 2014), one (a juv. male) is attributed to Uzbekistan: '7407\*(Kyzylkum)', but where more precisely this refers to is not indicated.

- Diadem snake *Spalerosophis diadema* (Schlegel, 1837)

**Synonyms:** for *S. d. schirasianus* (ssp. in Uzbekistan); *Spalerosophis diadema schiraziana*, *Sphalerosophis diadema schirasianus*, *Spalerosophis schirasianus*.

**Distribution in Uzbekistan:** Widespread but only documented from a few localities. In Karakalpakstan recorded in the Sarykamysh depression, S Kungirov (Qo'n'irat) district (Murzakhanov 2012); also mapped (Bannikov et al. 1977: map 119) and reported in the depression [centred approx. 41°50'N 57°30'E] in adjacent Turkmenistan

(Rustamova & Shammakov 1982). There are scattered sites in SE Karakalpakstan in the eastern Amu Darya deltaic plain [43°N 60-61°E], south-eastward through the E Kyzylkum of E Navoi province to NE Jizzakh/S Kazakhstan (Bannikov et al. 1977). Recently observed to be widespread in semi-desert in C and N Bukhara province, SW Kyzylkum (40°N 63-64°E, 175-220 m; DS pers. obs. 2012-15), although presence not mapped here (or in most of the Kyzylkum) by Bannikov et al. (1977) or Sindaco et al. (2013: map 95). In SE recorded on the Karnabchul steppe (39°55'N 65°09'E), S Navoi (Martin et al. 2017), also where previously undocumented. Elsewhere recorded in S Surkhandarya, and the E Fergana Valley within Namangan province [approx. 40°50'N 71°20'E] and extreme E Andijan or adjacent Kyrgyzstan [approx. 40°40'N 72°55'E] (Bannikov et al. 1977).

Altitudinal limits in Uzbekistan uncertain. Estimated as from 60 m asl (N Karakalpakstan), recorded at 310 m (Karnabchul steppe; T. Martin pers. comm. 2018) and in the Fergana Valley (Namangen) estimated (very tentatively) as up to at least 370 m. Recorded up to 1,800 m in Turkmenistan (Rustamova & Shammakov 1982).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 3 ssp. proposed but taxonomy complex and not fully resolved: *S. d. schirasianus* in Uzbekistan (and elsewhere in Central Asia) is considered a distinct subspecies (Schätti et al. 2010).

**Remarks:** Baig and Masroor (2008) indicate six locations, labelled '*S. d. diadema*', through SE Uzbekistan but it is unclear as to where these relate as shown on a very small scale map. The locations appear extrapolated from a map in Gasperetti, 1988 (Fig. 71; the data relevant to Central Asia for this map cited as 'Bannikov et al. 1977').



*Spalerosophis diadema* C-N Bukhara province, 17/6/12 (Photo: David A. Showler).

- Dice snake *Natrix tessellata* (Laurenti, 1768)

**Synonyms:** *Coronella tessellata*, *Tropidonotus tessellatus*, *Xenochrophis tessellata*.

**Distribution in Uzbekistan:** Widespread but absent from arid expanses lacking permanent water. In Karakalpakstan recorded around the southwestern periphery of the Aral Sea and widespread through the Amu Darya delta region (Bannikov et al. 1977: map 96). Absent from most of the Kyzylkum but appears a recent colonist in some areas, extending well into the desert zone via (and inhabiting) canals and associated 'man-made' wetlands (e.g. Karakyr, 40°15'32"N 63°49'35"E, and a large flowing canal south of Lake Ayakagytma, 40°29'59"N 64°31'27"E, Bukhara province; DS pers. obs. 2015). Also in freshwater habitats (canals and wetlands) around the west shore of Lake Aydarkul (Martin et al. 2017) on the southeastern Kyzylkum periphery. Widespread in S, SE and E (Bannikov et al. 1977, Sindaco et al. 2013: map 111, Vashetko et al. 2003: Fig. 5).

Altitudinal limits are estimated as from 50 m (Aral Sea area) up to 1,400 m asl (NE Tashkent province).

**Red List Category:** Least Concern (IUCN 2018; last assessed 2009).

**Ssp:** Monotypic. Note, numerous subspecies have been described but none currently appear considered valid.

**Remarks:** *N. tessellata* is almost exclusively confined to areas with water. No records for the Kyzylkum are indicated in Bannikov et al. (1977). Sindaco et al. (2013) only map presence within it in Kazakhstan (44°N 63°E) and around its southern (39°N 63-64°E) and southeastern periphery in Uzbekistan. However, irrigation projects involving construction of large canals and associated wetlands arising due to water seepage and flooding, have undoubtedly led to range expansion into otherwise arid desert regions in recent decades.



*Natrix tessellata* by canal near Karakyr wetlands, C-N Bukhara province (Photo: David Hodkinson).

- Sand racer *Psammophis lineolatus* (Brandt, 1838)

**Synonyms:** *Psammophis lineolatum*, *Taphrometopon lineolatum*.

**Distribution in Uzbekistan:** Very widespread in sandy desert and semi-desert, and arid foothills. In Karakalpakstan, there are records from the Ustyurt Plateau, and widespread in S Kungiro (Qo'n'irat) district around its southern periphery (i.e. Shakhpakhty area, Assake-Audan depression and Sarykamysh depression; Murzakhanov 2012). Occurs throughout the Kyzylkum (many observations in Bukhara and S Navoi provinces; DS pers. obs. 2012-15; Martin et al 2017); also widespread in S, SE and E Uzbekistan (Bannikov et al. 1977: map 129, Sindaco et al. 2013: map 122, Vashetko et al. 2003: Fig. 5).

Occurs from an estimated 40 m asl (Aral Sea area) up to 1,100 -1,200 m (W Tien Shan, NE Tashkent province; Vashetko et al. 2003). Through Central Asia found from lowlands up to about 2,600 m asl (Szczerbak 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** Monotypic.



*Psammophis lineolatus* near Gazli, W Bukhara province (Photo: David A. Showler).

## Family Elapidae (Cobras, coral snakes, kraits and sea snakes)

- Central Asian cobra *Naja oxiana* (Eichwald, 1831)

**Synonyms:** *Naja naja*, *Naja naja oxiana*.

**Distribution in Uzbekistan:** Mostly foothills of S and SE, south of the Zerafshan Darya (especially the Gissar Range; Kazakow 2012) from the Amu Darya (39°N 64°E) east to Samarkand (western spurs of Turkestan/ Turkestan Ugam Range) and Jizzakh provinces (Ananjeva et al. 2006, Sindaco et al. 2013: map 133). North of the Zerafshan Darya occurs in the Nuratau Range, including low mountains of Sarmysh, SE Navoi (Martin et al. 2017), and in the Kyzylkum recorded in C Navoi ([east of Zarafshan city, approx. 41°30'N 65°25'E]; Bannikov et al. 1977: map 123). There is a 'vague' record (most northerly for *N. oxiana* if confirmed) from the Bukantau Mountains area, N Navoi (42°N 64°E; Sindaco et al. 2013). Absent from E.

Altitudinal limits in Uzbekistan uncertain, recorded from at least as low as 300 m asl in the Karnabchul foothills, S Navoi (39°55'N 65°09'E; T. Martin pers. comm. 2018). Within Central Asia found up to about 2,000 m (Rustamova & Shammakov 1982).

**Red List Category:** Data Deficient (IUCN 2018; last assessed 1996); Near Threatened, RDB of Uzbekistan (Azimov et al. 2009), declining due to habitat loss to agriculture.

**Ssp:** Monotypic.

**Remarks:** In the C Asian part of its range (i.e. Uzbekistan, SW Tajikistan and Turkmenistan), due to 'intensive economic development', populations in river valleys, submontane deserts and foothills are considered especially vulnerable to habitat loss (Ananjeva et al. 2006). Also subject to collection, but the trade in *N. oxiana* is poorly understood (CITES 2011).



*Naja oxiana* in mountains adjacent to Sarmysh Nature Park, S Navoi province (Photo: Tom Martin – RENECO - ECCH).

## Family Viperidae (Vipers)

**Genus *Gloydius*:** The genus *Gloydius* (Hoge & Romano-Hoge, 1981) was created for ‘Asian ground pit vipers’ previously included in *Agkistrodon* (*Agkistrodon* now restricted to American species). Formerly family Crotalidae, following molecular and morphological investigations, pit vipers are now treated as the subfamily Crotalinae within Viperidae.

- Halys pit viper *Gloydius halys* (Pallas, 1776)

**Synonyms:** *Agkistrodon halys*, *Ancistrodon halys*, *Gloydius halys*.

**Distribution in Uzbekistan:** Widespread, recorded in Karakalpakstan, the N Kyzylkum (but absent from most of the desert, see below), SE, S and E. *G. h. caraganus* is the subspecies present over most (or all) of the species range within Uzbekistan, but *G. h. halys* may occur in NE Tashkent province (see Remarks). In Karakalpakstan mapped around the periphery of the Ustyurt Plateau (Sindaco et al. 2013: map 145), documented in the Sarygamysh depression (Murzakhanov 2012) and observed as far north as at least 44°01'N 58°14'E near Kubla-Ustyurt village (J. Burnside pers. comm. 2017). In the N Kyzylkum, recorded in the NE Karakalpakstan/N Navoi/Kazakhstan border area (43°N 61-62°) and in the vicinity of Bukantau Mountains, N Navoi (42°N 63°E); additionally a ‘vague’ record (i.e. requiring confirmation) in 42°N 64°E (Sindaco et al. 2013). Also along the Amu Darya valley further south in lat-long squares 41°N 60°E (NW Khorezm area) and 39°N 63°E on the Uzbekistan-Turkmenistan border (Sindaco et al. 2013) but it is uncertain if these relate to Uzbekistan. Not documented for the Sundukli Sands of Uzbekistan (or Turkmenistan; Schammakov et al. 1993). Widespread in hills of SE (including Nuratau Range) and S (Zerafshan and Gissar Ranges, south to N Surkhandarya).

In E, found on spurs of the Tien Shan (Tashkent province), and in ‘mountains and foothills surrounding the Fergana Valley up to 3,300 m’ ([translation from Russian] Vashetko et al. 2003). *G. h. caraganus* is said typically to inhabit desert and hills up to about 1,000 m asl, and not to occur in high mountains where replaced at higher elevations by *G. h. halys* that occurs up to 3,000 m (Orlov & Barabanov 1999). If *G. h. halys* is present in Uzbekistan is unclear.

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 6-9 (taxonomy unresolved); *G. h. caraganus* and others may warrant species rank (Wagner et al. 2016b). *G. h. caraganus* (Asiatic pit viper) occurs over most of range in Uzbekistan; *G. h. halys* (Eastern pit viper) may be present in mountains of the E (see Remarks).

**Remarks:** Limits of distribution of subspecies is unclear. *G. h. caraganus* appears to be the taxa present over most or all of the species range within Uzbekistan. However, it is possibly sympatric (subject to altitudinal zonation) with *G. h. halys* in Tashkent province as *G. h. halys* is indicated on a generalised distribution map (Orlov & Barabanov 1999: map 1) as occurring west to approx. 70°E. However, it appears uncertain if the nominate occurs in Uzbekistan at all, as distribution is usually described as further east: e.g. from the Mamyn River (53°N 129°30'E), Mongolia, S Siberia and E Kazakhstan to 74°E (Orlov & Barabanov 1999); and ‘from E Kazakhstan eastwards’ (Sindaco et al. 2013). The eastern-most point of Uzbekistan lies at approx. 73°10'E. However, given reported altitudinal limits of *G. h. caraganus* of up to about 1,000 m (Orlov & Barabanov 1999), and observations up to 3,300 m in the W Tien Shan, Tashkent province (Vashetko et al. 2003), this lends weight to *G. h. halys* being present in mountains of E Uzbekistan.



*Gloydius halys* near Kubla-Ustyurt village, Karakalpakstan (Photo: John Burnside).

- Saw-scaled viper *Echis carinatus* (Schneider, 1831)

**Synonyms:** *Echis multisquamatus*, *Echis sochureki*.

**Distribution in Uzbekistan:** Fairly widespread through E Karakalpakstan (i.e. east of the Amu Darya) including the N Kyzylkum, eastwards across the desert into N Navoi province, but no records located for the C Kyzylkum (except in extreme west close to the Amu Darya). There are a few localities where recorded in the SE and S, but absent from E. In Karakalpakstan scattered sites are mapped east of the Amu Darya across the deltaic plain, and in the N Kyzylkum into N Navoi province to the Bukantau Mountains area ([approx. 42°15'N 63°30'E] Bannikov et al. 1977: map 124), with 'vague' records further east (42°N 64-65°E; Sindaco et al. 2013: map 155). To the south, recorded in Khorezm ([south to approx. 40°40'N 62°17'E, possibly extending into extreme NW Bukhara province]; Bannikov et al. 1977). Recently observed in the SE Kyzylkum between Zarafshan city and Lake Aydarkul, SE Navoi (Martin et al. 2017). South of the Zerafshan Darya recorded east of Alat/south of Bukhara city (39°N 63-64°E; Sindaco et al. 2013), and on the Karnabchul steppe, S Navoi (39°55'N 65°09'E, 310 m asl; T. Martin pers. comm. 2018). Also present in Kashkadarya and Surkhandarya (Bannikov et al. 1977).

Altitudinal limits in Uzbekistan uncertain. Recorded from an estimated 60 m asl (Karakalpakstan) up to at least 310 m in the Karnabchul foothills, S Navoi (39°55'N 65°09'E; T. Martin pers. comm. 2018). Within the C Asian Republics found up to 950 m (Rustamova & Shammakov 1982).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** 2-4: *E. c. sochureki* (Sochurek's saw-scaled viper) in Uzbekistan.

**Remarks:** '*Echis multisquamatus* Cherlin, 1981' (Turkmenistan, Uzbekistan, SW Tajikistan, E Iran, Afghanistan and NW Baluchistan, Pakistan) recognised by some authorities or considered a subspecies (*E. c. multisquamatus*), appears now generally regarded as conspecific with *E. c. sochureki* as indicated by several studies, including molecular phylogenetic analyses (e.g. Arnold et al. 2009, Pook et al. 2009), although *E. c. sochureki* itself may warrant species status.



*Echis carinatus* Karnabchul steppe, S Navoi province (Photo: Tom Martin – RENEKO - ECCH).

**Genus Macrovipera:** *Macrovipera* was reinstated by Hermann et al. (1992) for four taxa previously in the genus *Vipera*. Following later phylogenetic analyses, only two are currently allocated to *Macrovipera*, one being *M. lebetina* (West and Central Asia to N Pakistan), the other the closely related *M. schweizeri* (Cyclades archipelago, E Mediterranean) that is considered conspecific by some authorities.

- Blunt-nosed viper *Macrovipera lebetina* (Linnaeus, 1758)

**Synonyms:** *Macrovipera lebetina černovi*, *Macrovipera lebetina chernovi*.

**Distribution in Uzbekistan:** Two subspecies, *M. l. cernovi* (Chernov blunt-nosed viper) and *M. l. turanica* (Central Asian blunt-nosed viper) occur but their respective distributions (including whether or not there is a zone of sympatry) within Uzbekistan are unclear. For each, distribution is described simply as 'Uzbekistan' by Szczerbak (2003). Sindaco et al. (2013) make no specific mention of either regards Uzbekistan, i.e. *cernovi* in 'NE Iran, S Turkmenistan, N Afghanistan and Pakistan (Kashmir)', and *turanica* 'E Turkmenistan to SW Kazakhstan, and disjunct areas of N Afghanistan and W Pakistan'.

*M. l. cernovi* is stated as occurring in 'western Uzbekistan' by Ananjeva et al. (2006), and it is presumably *cernovi* that is mapped in isolation (43°N 59°E) well north of other C Asian records (Sindaco et al. 2013: map 161) on the Amu Darya deltaic plain in Karakalpakstan. Otherwise one area, the 'Kyzylkum Reservation' [Kyzylkum National Reserve, S Khorezm/NW Bukhara provinces; 40-41°N 62°E], is specifically documented as supporting *M. l. cernovi*, where studied by Cherlin and Shepilov (2014). The reserve runs along the Amu Darya valley for about 30 km along a braided section of the river channel in a strip of about 3 km wide (rather than the desert itself).

Elsewhere, mainly known from foothills of the SE (e.g. scattered records in Jizzakh, Samarkand and N Kashkadarya provinces; Bannikov et al. 1977: map 134) and these are probably referable to *M. l. turanica* given confirmed on 'Nuratau Crest' (Cherlin & Shepilov 2014) to the north of Samarkand city (Samarkand province). Indicated as far east as (in isolation) C Tashkent province (Stümpel & Joger 2009) but not mapped/reported in this area by Sindaco et al. (2013) or Vashetko et al. (2003). Also present in S, where mapped around the environs of Kitab town [approx. 39°07'N 66°53'E], NE Kashkadarya (Stümpel & Joger 2009: Fig. 3), and in Surkhandarya (Bannikov et al. 1977).

Altitudinal limits estimated at approximately 70 m asl (south of the Aral Sea) up to at least 655 m (vicinity of Kitab, Kashkadarya). In Central Asia recorded up to 1,500 m (Szczerbak 2003).

**Red List Category:** Not yet assessed (IUCN 2018).

**Ssp:** Taxonomy unresolved but phylogenetic analysis confirms validity of 4 spp. (of up to 9), including *M. l. cernovi* and *M. l. turanica* (Stümpel & Joger 2009) in Uzbekistan.

**Remarks:** *M. lebetina* was found in 1951 in SW Kazakhstan but in an area now within Uzbekistan territory, therefore not included on the current Kazakhstan national checklist (Dujsebayaeva 2010).

- Meadow viper *Vipera renardi* (Christoph, 1861)

**Synonyms:** *Vipera ursinii renardi*.

**Distribution in Uzbekistan:** Local, patchy distribution in submontane to mountain environments (e.g. floodlands/lake shores, rocky slopes and subalpine grasslands) between 1,000 to 2,750 m in spurs of the W Tien Shan, including valleys of the Aksakata, Chirchik and Syr Darya rivers (Azimov et al. 2009, Vashetko et al. 2003: Fig. 5) in Tashkent province. Recorded eastwards to at least the western slopes of the upper Angren River valley [approx. 41°08'N 70°22'E] just west of Kamchick Pass (Vashetko et al. 2003) on the Tashkent/Namangan provincial border (perhaps extends into NW Namangan). Occurs southwest to 39°N 66°E (Sindaco et al. 2013: map 183) in the Zerafshan Range within Samarkand/N Kashkadarya provinces. Note, within Uzbekistan only mapped as in Tashkent province, including the border area with Namangan by Gvoždík et al. 2012 (Fig. 1).

**Red List Category:** Not yet assessed (IUCN 2018). Vulnerable, RDB of Uzbekistan (Azimov et al. 2009).

**Ssp:** 3 (to 7): *V. r. tienshanica* (Tien Shan meadow viper) in Uzbekistan.

**Remarks:** Taxonomy unresolved but phylogenetic analyses confirm validity of 3 spp., including *V. r. tienshanica* (Gvoždík et al. 2012).

## Acknowledgements

Many thanks to Tom E. Martin for numerous unpublished locations and habitat notes for several species gathered during fieldwork in Uzbekistan in 2011-2015 (as well as photographs), and editorial input. Also, John Burnside, Rémy Eudeline, David S. Farrow, João Guilherme, David Hodgkinson, Maxim Koshkin, Nicolas Orhant, Mark Pestov, Andy Swash, Andrew Taylor and Vladimir Terentyev (furthermore for help in Russian translation) for additional observations and photos. I am grateful to Pierre-André Crochet for thoughts on *Pelophylax* and Matthias Stöck for papers regarding the *Bufo viridis* complex.

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**Author's note:** This checklist is freely available as a PDF and designed to promote interest in, and conservation of, the herpetofauna of Uzbekistan. In terms of English language publications, such a synthesis appears not to have been undertaken previously. Thus, the checklist draws together information concerning all species present within the country and summarises their distributions in one easily accessible document, for the first time. The work was undertaken unfunded, the review was undertaken as exhaustively as possible given available resources.

Undoubtedly there will be errors. If you locate any, or have updates please send suggested amendments to David Showler (e-mail: [dashowler@hotmail.com](mailto:dashowler@hotmail.com)). Within Uzbekistan, it is apparent that the distribution of several species remains unclear and that altitudinal data is sparse for many.