

### 1.3. Main Trends of Biodiversity Transformation

The ecological imbalance observed in recent decades resulted in the great change of biodiversity composition and structure at all levels – from ecosystems, communities, and species to populations. Many ecosystems are preserved in narrow ecological “niches”.

The main factors of influence on biodiversity are:

- Increasing ploughed lands in the areas of natural ecosystems and valuable vegetation communities;
- unregulated hunting for rare endemic species of animals and plants;
- uncontrolled gathering of medicinal, food, and forage plants;
- trees and shrubs cutting;
- livestock overgrazing;
- construction of roads, electric power lines, communication and irrigation systems;
- fires;
- location of industrial enterprises and constructions in the zones of unique ecosystems without consideration of their ecological capacity;
- development of mining industry;
- local and global climate change.

The main socio-economic reasons for biodiversity degradation are:

- uneven spread of the population and productive forces in natural and administrative zones;
- lack of territorial, environmental, and nature-management plans and programs considering ecological capacity;
- lack of economic and financial incentives and mechanisms in biodiversity conservation;
- lack of real economic evaluation of biodiversity as a national heritage of the country;
- uncontrolled sale of biodiversity components at internal and external markets;
- low level of environmental education of the population;
- consumers' use of biodiversity;
- barriers between branch institutions in the realization of programs on the conservation and rational use of biodiversity;

- lack of relevant legislative acts and inefficiency of current laws on biodiversity conservation;
- insufficient status and power of environmental authorities, including the National Coordinator on Biodiversity;
- non-observance of state, institutional, and international decisions on the part of environmental bodies and local Khukumats;
- absence of the State biodiversity monitoring system;
- non-observance of the requirements of the Convention on providing information to the authorized body of National Biodiversity Strategy and Action Plan (NBSAP) development and irresponsibility of organizations managing unique areas;
- reducing activity in agroecosystem exploitation.

Considerable transformation of biodiversity is caused by anthropogenic factor that consists of many components (fig. 1.12). The main anthropogenic factor for the specific diversity alteration is the ecologically imbalanced scheme of nature use in natural ecosystems.

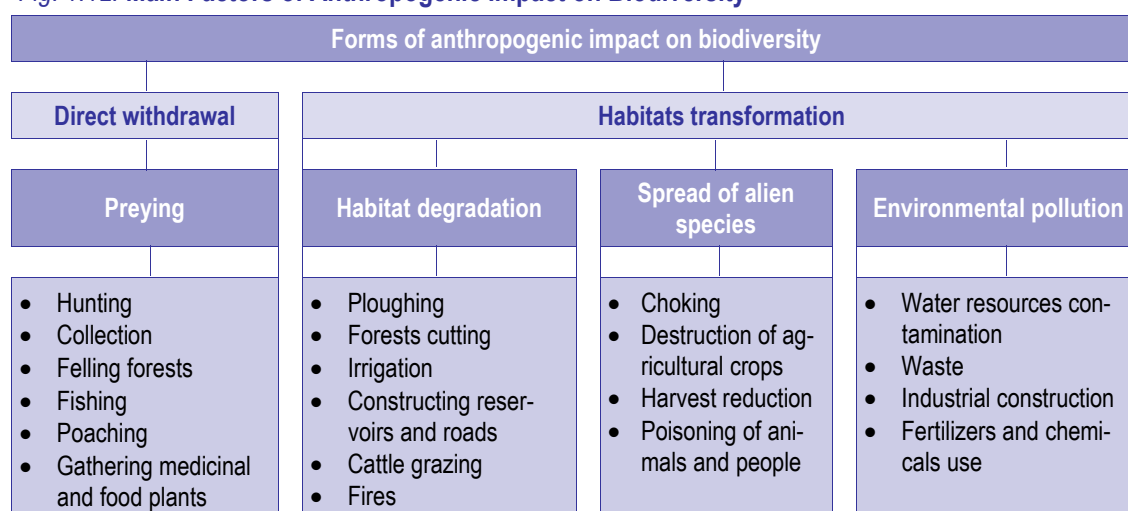
The anthropogenic impact caused the fragmentary replacement of natural ecosystems in the zones of rain-fed farming, natural pastures and even forests. This process tends to grow, accompanied by reducing the diversity of population, species, and biocoenoses and lowering the species resistance.

Altogether, anthropogenic factors promote the quantitative and qualitative impoverishment of biodiversity and, consequently, the transformation of natural ecosystems (table 1.8).

Direct factors influencing the specific diversity are as follows:

- Destruction of natural ecosystems, ploughing steep-slope and forested areas;
- Destruction of great numbers of animals and plants preyed and gathered for commercial purposes and collections;
- Loss of animals at engineering construction sites and automobile roads;
- Mining natural resources within unique ecosystems;

**Fig. 1.12. Main Factors of Anthropogenic Impact on Biodiversity**



**Table 1.8. Dynamics of areas and number of species in ecosystems (1950-2002)**

No.	Type of ecosystem	1950		1970		1990		2002	
		Area, m. ha	*Number of species	Area, m. ha	*Number of species	Area, m. ha	*Number of species	Area, m. ha	*Number of species
1.	Nival glacier	3.0	130 10	3.0	130 12	2.95	140 15	2.9	180 16-17
2.	Subnival high-mountain desert	3.1	1500 700	3.1	1400 690	3.2	1300 680	3.4	1100 650
3.	High-mountain meadow-steppe	3.1	2500 750	3.1	2450 750	3.05	2400 730	3.150	2400 730
4.	Mid-mountain juniper forest	0.9	3000 1300	0.9	3000 1300	0.88	2350 1290	0.8	2900 1280
5.	Mid-mountain mesophyllic forest	0.25	3500 1800	0.15	3450 1790	0.25	3400 1710	0.2	3390 1700
6.	Mid-mountain xerophytic light forest	0.67	6000 2500	0.65	6000 2500	0.6	5980 2450	0.58	5950 2400
7.	Mid- low-mountain savannoide	1.1	5000 700	1.05	4900 550	1.0	4800 500	1.0	4500 450
8.	Foothill semidesert and desert	0.7	2500 620	0.66	2400 580	0.57	2200 550	0.34	2000 520
9.	Wetland	0.4	5000 600	0.5	4500 530	0.5	4200 450	0.5	4000 400
10.	Agroecosystem	0.7	3500 1200	0.73	3200 1100	0.82	3100 1000	0.85	3000 900
11.	Urban	0.19	2800 250	0.225	2500 200	0.237	2200 180	0.229	2000 250
12.	Ruderal-degraded	0.2	850 25	0.24	750 30	0.25	1000 50	0.36	2000 70

\*Numbers of plants (denominator) and animals (numerator)



Ruderal-degraded ecosystem

- Complete water intake and exsiccation of small rivers;
- Water contamination in the areas of unique animal species and ecosystems.

Change in the land-use structure, without considering the ecological capacity of the country, led not only to a change in the vegetation composition, landscapes, and ecosystems but also in speeding up the process of land degradation and desertification (fig. 1.13).

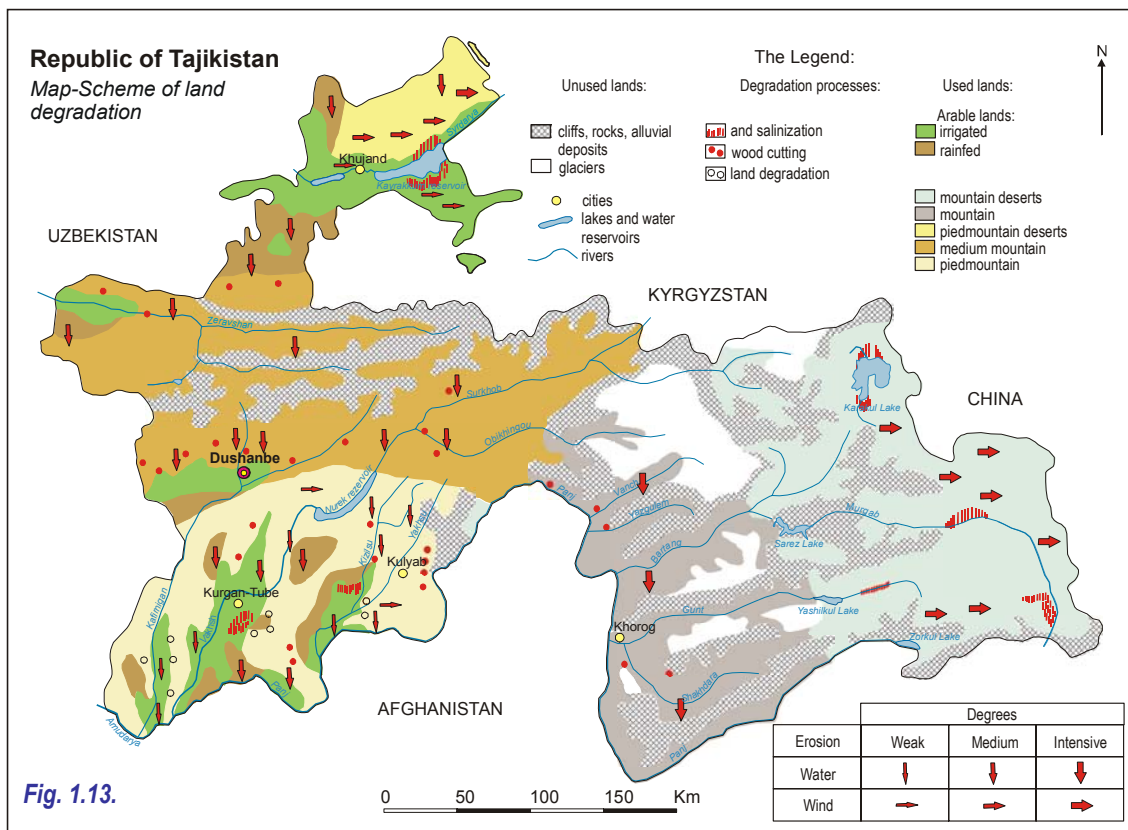
Land ploughing caused the reduction of valuable populations of some forage plants: bulbous meadow grass (*Poa bulbosa*), hair wheat

grass (*Elytrigia ritchophora*), bulbous barley (*Hordeum bulbosum*), *Botriochloa ischaemum*, thin-leaf vetch (*Vicia tenuifolia*), alfalfa (*Medicago sativa*), esparcet (*Onobrychis pulchella*), milk vetch (*Astragalus sp.*), and others that are a valuable genetic resource for selection and introduction.

The ploughed area of the republic is 849,6 ths ha (5.9% of the total area). During the last 40 years, the area of irrigated lands increased twice due to the use of valuable plants areas.

The unique tugai forests and desert-sandy ecosystems of Southern and Northern Tajikistan have reduced to small (10-30 ths ha) islands (fig. 1.14).

During the last decades, deforestation has become really threatening. The area of valuable juniper (*Juniperus*), walnuts (*Juglans*), birch (*Betula*), and pistachio (*Pistacia*) forests has been reduced by 20-25%. This produces a negative impact on the state of natural ecosystems and coenosis structures. The specific diversity is gradually transforming, and community compositions losing over 8-10 species of



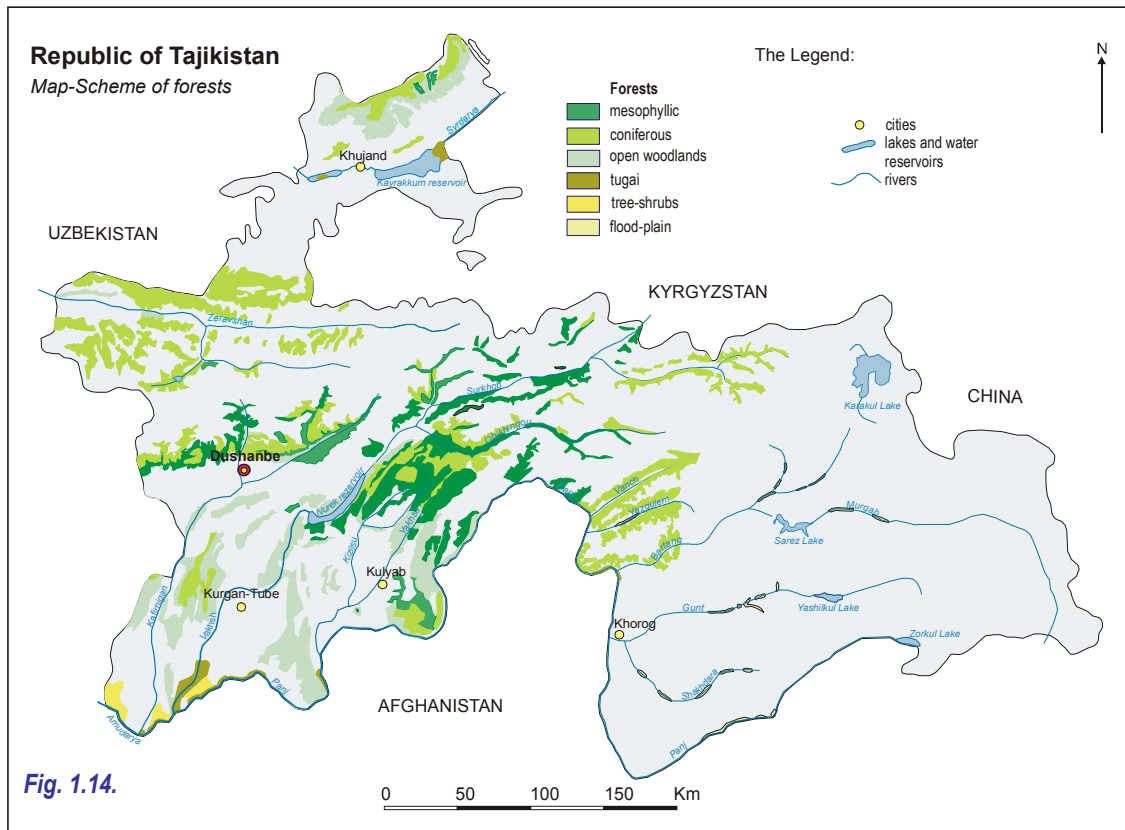


Fig. 1.14.

List of Extinct Species of Plants and Animals

Name	
<b>Plants</b>	
<i>Silene caudata</i>	
<i>Juno popovii</i>	
<i>Juno tadshikorum</i>	
<i>Astragalus darwasicus</i>	
<i>Hedysarum korshinskyanum</i>	
<i>Oxytropis mumynabadensis</i>	
<i>Allium gracillimum</i>	
<i>Allium incrustatum</i>	
<i>Allium minutum</i>	
<i>Allium pauli</i>	
<i>Allium schugnanicum</i>	
<i>Bellevalia inconspicua</i>	
<i>Eremurus micranthus</i>	
<i>Tulipa anisophylla</i>	
<i>Delphinium nevskii</i>	
<i>Populus cataracti</i>	
<b>Animals</b>	
<i>Panthera tigris virgata</i>	
<i>Marmota menzbieri</i>	
<i>Pseudoscaphirinchus fedtschenkoi</i>	

ecosystems during 3-7 years. Tree cutting leads to an outbreak of weeds, alien and quarantine plant species, erosion, and a progressive insicication and impoverishment of winter pastures. Shrub vegetation is being eradicated and used as fuel.

For the last 50 years due to the impact of anthropogenic factor, 226 plant taxa and 162 animal species have become rare or endangered and are listed in the Red Data Book of Tajikistan (fig. 1.18, 1.19); 10 invertebrate species are listed in the Red Data Book of the IUCN.

3 species of animals and 16 species of plants are extinct.

The most vulnerable have become reptiles and mammals. Of total species, 50% of mammals and 44.7% of reptiles are listed in the Red Data Book of Tajikistan.

Among the vertebrates of Tajikistan, the psammobiont forms of reptiles – *Crossobamon eversmanni*, *Teratoscincus scincus*, *Phrynocephalus myctaceus*, *Echis carinatus*, etc. turned to be the most vulnerable to the anthropogenic transformation.



**Table 1.9. Type Classification of Forested Areas and Plant Resources**

Name	Total
	Area ths ha
Conifers. <i>including:</i>	146.5
Juniper ( <i>Juniperus</i> )	146.5
Hard-leaf. <i>including:</i>	62.8
Saxaul ( <i>Haloxylon persicum</i> )	11.4
Elm ( <i>Ulmus</i> )	0.7
Ash-tree ( <i>Fraxinus</i> )	0.7
Maple ( <i>Acer</i> )	49.1
Bastard acacia ( <i>Robinia pseudacacia</i> )	0.9
Soft-leaf. <i>including:</i>	14.9
Birch ( <i>Betula</i> )	1.9
Poplar ( <i>Populus</i> )	9.3
Tree willow ( <i>Salix sp. div</i> )	3.7
<b>Total of major forest-forming breeds</b>	<b>224.2</b>
Other tree breeds. <i>including:</i>	110.3
Almond ( <i>Amygdalus</i> )	17.6
Walnut ( <i>Juglans regia</i> )	11.2
Cherry plum ( <i>Prunus sogdiana</i> )	2.6
Pistachio ( <i>Pistacia vera</i> )	78.9
Shrubs. <i>including:</i> Tamarisks ( <i>Tamarix</i> ) Wild rose ( <i>Rosa</i> ). barberry ( <i>Berberis</i> )	66.5
<b>Total:</b>	<b>401</b>

**Table 1.10. Dynamics of Wild Animal Hunting (individuals)**

Name	1990	2000
Siberian ibex ( <i>Capra sibirica</i> )	250	20
Fox ( <i>Vulpes vulpes</i> )	750	388
Marten ( <i>Martes foina</i> )	416	200
Badger ( <i>Meles meles</i> )	185	20
Tolai hare ( <i>Lepus tolai</i> )	830	51
Partridge ( <i>Alectorius graeca</i> )	2700	210
Pigeon ( <i>Columbia columbia</i> )	7800	150
Red marmot ( <i>Marmota caudata</i> )	2200	500
Waterfowls	11070	1000

Destruction of native habitats and the deterioration of the environment in 1954 caused the complete disappearance of the Turan tiger (*Panthera tigris virgata*) from Tajikistan and from the face of Earth.

Habitats narrowing leads to a drop in numbers of wild animal populations, particularly in natural ecosystems (table 1.11, fig. 1.15-1.17).

Among the mammals and birds, the major game species are: wild boar (*Sus scrofa*), tolai-hare (*Lepus tolai*), red marmot (*Marmota caudata*), nutria (*Myocastor coypus*), muskrat (*Ondatra zibethica*), pigeon (*Columbia columbia*), and partridge (*Alectoris graeca*), etc. (table 1.10).

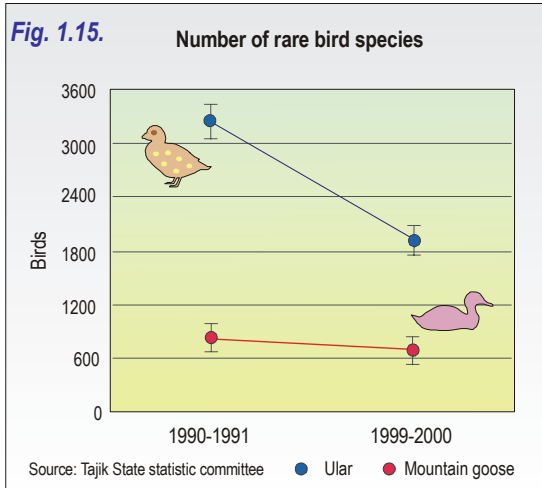
Numbers of many animal species, particularly snakes – Central Asian cobra (*Naja oxiana*), *Vipera lebetiana*, *Echis carinatus*, blind snake (*Typhlops vermicularis*), some lizards, snow leopard (*Uncia uncia*), Tien Shan brown bear (*Ursus arctos*), and other species keep reducing.

The Report criteria for assessing the tendencies of biodiversity transformation and vulnerability are based on the ecosystem approach and analysis of problem priorities.

Having evaluated the situation in biodiversity conservation and the tendencies of its

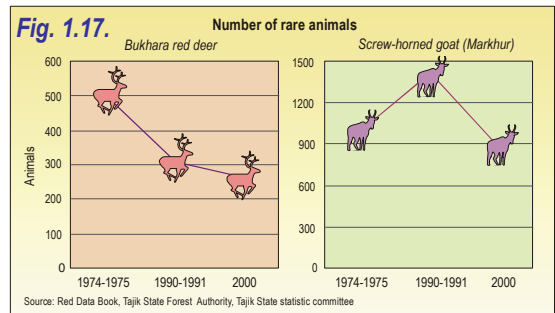
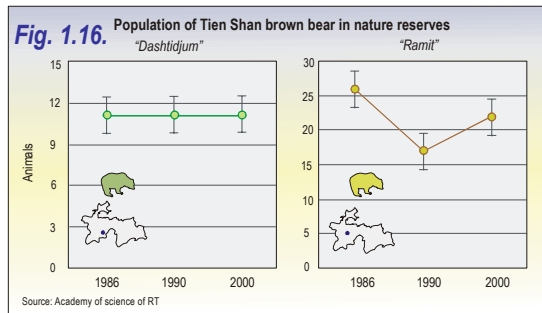


*Myocastor coypus*



transformation, the following priorities have been determined:

- degradation of natural ecosystems;
- specific biodiversity reduction and biocoenosis impoverishment;
- general environmental imbalance of landscapes;
- reduction of genetic resources of wild flora, cultivated plants, as well as wild relatives of domestic animals;
- destruction of wild animal migration routes; wild plant range restriction;
- poor level of the population environmental education.



**Table 1.11. Dynamics of Some Wild Animal Populations (for the 1990-2001 period)**

Species	Total in the Republic		Including					
	1990	2001	In RT Forestry Department		In Zapovedniks		In Zakazniks	
			1990	2001	1990	2001	1995	2001
Siberian ibex ( <i>Capra sibirica</i> )	28000*	18000	4425	1382	204	67	3205	664
Pamir argali ( <i>Ovis ammon</i> )	10000	3500-4000	4200	1235	–	208	3010	27
Jackal ( <i>Canis aureus</i> )	610	408	610	418	97	237	–	12
Red marmot ( <i>Marmota caudata</i> )	180000	130000	5687	2948	120	0	240	1347
Tibetan snow partridge ( <i>Tetraogallus tibetanus</i> )	3220	1231	3220	1231	290	13	910	505
Partridge ( <i>Alectoris graeca</i> )	442300	253560	4420	37600	7500	5300	5980	8160
Bar-headed goose ( <i>Anser indicus</i> )	1100	800	740	470	100	800	890	–
Sika deer ( <i>Cervus nippon</i> )	280	173	280	153	280	153	–	–
Tajik markhur ( <i>Capra falconeri</i> )	200-250	170-180	250	180	250	180	–	–
Pheasant ( <i>Phasianus colchicus</i> )	150000	130000	585	600	300	410	149	170
Porcupine ( <i>Hystrix leucura</i> )	1260	1100	413	280	387	264	26	16
Bukhara wild ram (urial) ( <i>Ovis vignei</i> )	1500-2500	300-350	1171	145	712	100	15	23
Bukhara or tugai deer ( <i>Cervus elaphus</i> )	650	350	305	186	407	144	13	–
Snow leopard ( <i>Uncia uncia</i> )	160-200	100-120	53	100	22	20	29	36
Wolf ( <i>Canis lupus</i> )	1200	1000	995	625	19	10,4	380	263
Persian gazelle ( <i>Gazella subgutturosa</i> )	250-200	80	130	111	130	111	–	–

\* Number of animals are noted considering varying in number to 10% on ascending and descending scale

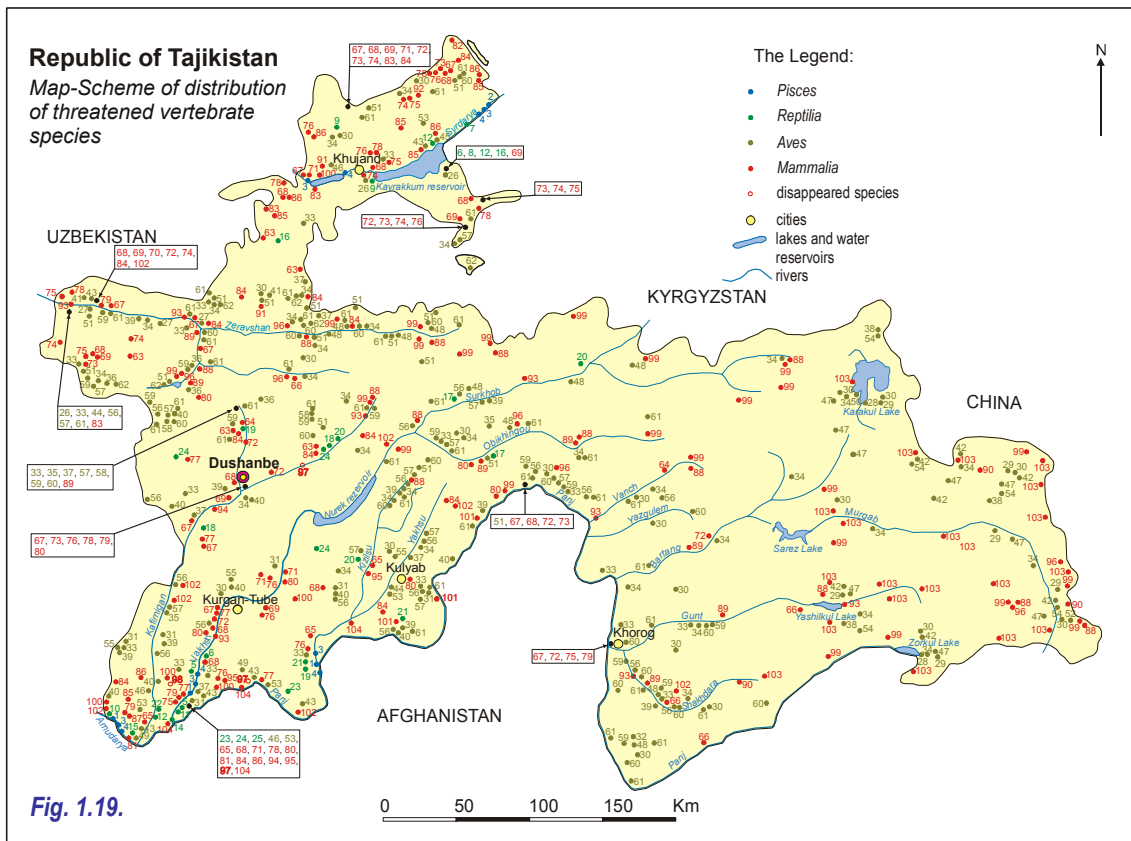
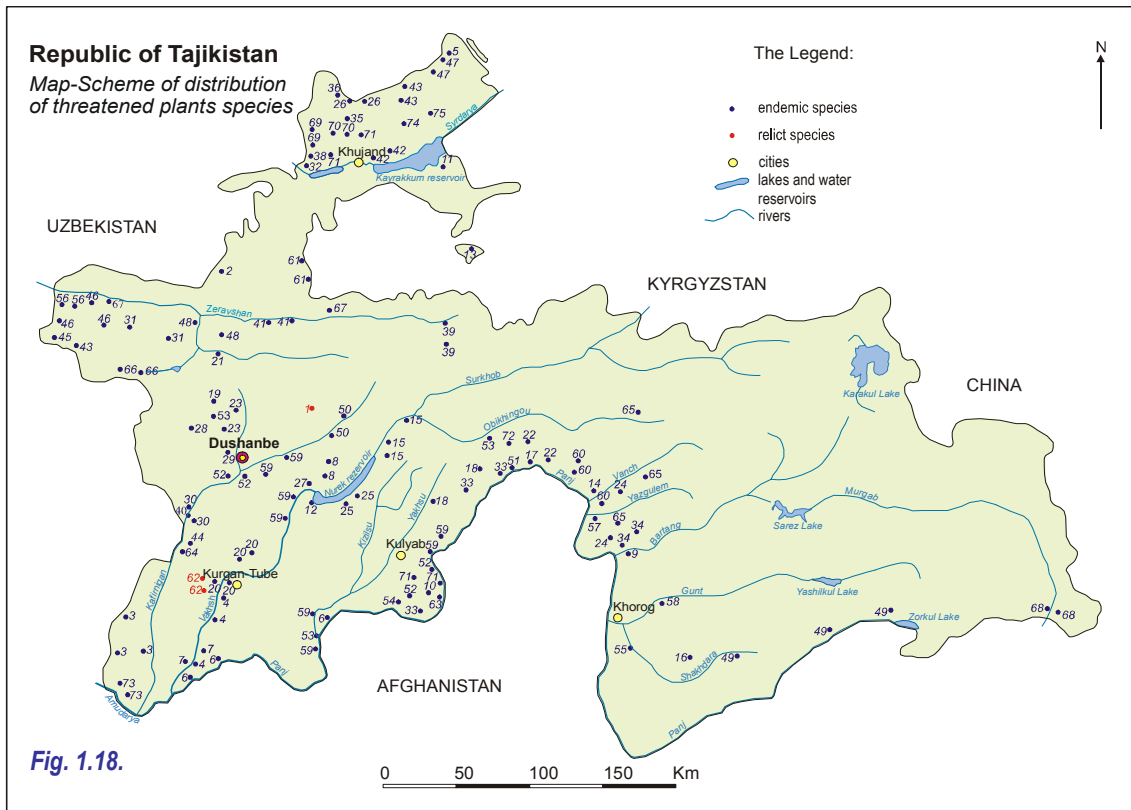


Fig 1.18. Legend to «Map-scheme of Distribution of Threatened Plants Species»

No.	Latin Names	1.18.	
1	2	1	2
1	<i>Thuja orientalis</i> L.	38	<i>Allium ferganicum</i> Vved.
2	<i>Ungernia oligostroma</i> M. Pop.et Vved.	39	<i>Tragacantha alekxeenkoana</i> B. Fedtsch. et Ivanova Boriss.
3	<i>Cleome lipskyi</i> M. Pop.	40	<i>Allium flavellum</i> Vved.
4	<i>Halocharis gossypina</i> Korov.et Kinzikaeva	41	<i>Allium lipskyanum</i> Vved.
5	<i>Polycnemum perenne</i> Litv.	42	<i>Allium ophiophyllum</i> Vved.
6	<i>Salsola drobovii</i> Botsch.	43	<i>Allium rosenbachianum</i> Regel
7	<i>Cousinia agelocephala</i> Tschern.	44	<i>Allium stipitatum</i> Regel
8	<i>Cousinia corymbosa</i> C. Winkl.	45	<i>Eremurus roseolus</i> Vved.
9	<i>Cousinia hilariae</i> Kult.	46	<i>Eremurus tadshikorum</i> Vved.
10	<i>Jurinea impressinervis</i> Iljin	47	<i>Gagea holochiton</i> M. Pop.et Czug.
11	<i>Jurinea pteroclada</i> Iljin	48	<i>Gagea villosula</i> Vved.
12	<i>Jurinea tadshikistanica</i> Iljin	49	<i>Scilla raevskiana</i> Regel
13	<i>Pyretrum mikeschirii</i> Tzvel.	50	<i>Tulipa affinis</i> Z. Botsch.
14	<i>Saussurea caprifolia</i> Iljin et Zapr.	51	<i>Tulipa bifloriformis</i> Vved.
15	<i>Saussurea tadshikorum</i> Iljin et Gontsch.	52	<i>Tulipa greigii</i> Regel
16	<i>Taraxacum schugnanicum</i> Schischk.	53	<i>Tulipa lanata</i> Regel
17	<i>Thelycrania darvasica</i> Pojark.	54	<i>Tulipa linifolia</i> Regel
18	<i>Arabidopsis bactriana</i> Ovcz.et Junussov	55	<i>Tulipa maximowiczii</i> Regel
19	<i>Phaeonychium abalakovii</i> Junussov	56	<i>Tulipa rosea</i> Vved.
20	<i>Stroganovia tolmaczewii</i> Junussov	57	<i>Tulipa subquinquefolia</i> Vved.
21	<i>Stipa jagnobica</i> Ovcz.et Czuk.	58	<i>Tulipa subpraestans</i> Vved.
22	<i>Juno baldshuanica</i> O. et B. Fedtsch. Vved.	59	<i>Tulipa tubergeniana</i> Hoog
23	<i>Dracocephalum formosum</i> Gontsch.	60	<i>Neogontscharovia miranda</i> Lincz. Lincz.
24	<i>Erianthera rhomboidea</i> Benth.	61	<i>Polygonum oczinnikovii</i> Czuk.
25	<i>Salvia baldshuanica</i> Lipsky	62	<i>Dionysia involucrata</i> Zapr.
26	<i>Salvia glabricaulis</i> Pobed.	63	<i>Primula lactiflora</i> Turkev.
27	<i>Salvia gontscharovii</i> Kudr.	64	<i>Punica granatum</i> L.
28	<i>Astragalus artemisiformis</i> Rassul.	65	<i>Delphinium decoloratum</i> Ovcz.et Kocz.
29	<i>Astragalus subspongocarpus</i> Ovcz. et Rassul.	66	<i>Delphinium ovczinnikovii</i> Kam.et Pissjauk.ex Kam
30	<i>Chesneya neplii</i> Boriss.	67	<i>Pulsatilla kostyczewii</i> Korsh. Juz.
31	<i>Ewersmannia sogdiana</i> Ovcz.	68	<i>Fragaria bucharica</i> Losinsk.
32	<i>Hedysarum hemithamnoides</i> E. Korotk.	69	<i>Prunus darvasica</i> Temberg
33	<i>Keyserlingia mollis</i> Royle Boiss.	70	<i>Prunus tadshikistanica</i> Zapr.
34	<i>Oxytropis astragaloides</i> Boriss.	71	<i>Pyrus cajan</i> Zapr.
35	<i>Oxytropis kuramensis</i> Abduss.	72	<i>Rosa longisepala</i> Kocz.
36	<i>Tragacantha dolona</i> Rassul. et B. Scharipova	73	<i>Tylosperma lignosa</i> Willd. Botsch.
37	<i>Allium elegans</i> Drob.	74	<i>Myrtama elegans</i> Royle Ovcz. et Kinz



Fig. 1.19. Legend to «Map-scheme of Distribution of Vertebrates Listed in the Red Data Book of Tajikistan»

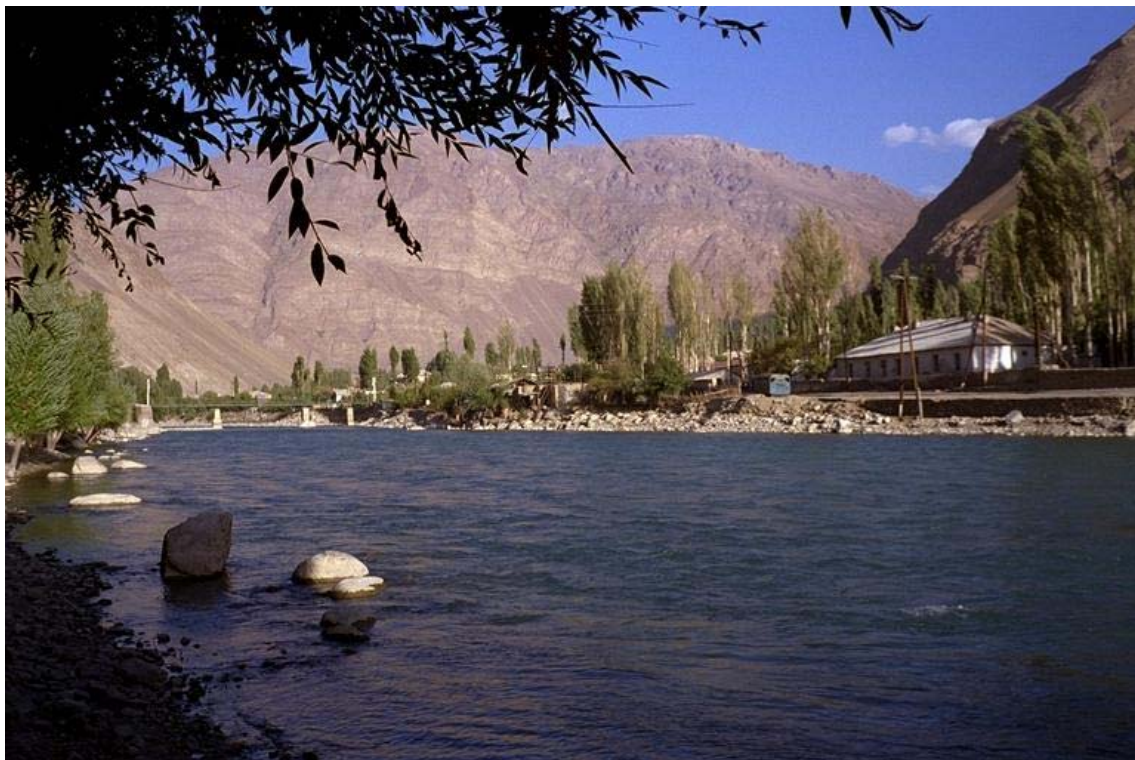
No.	Latin Names	1.19.	
1	2	1	2
<b>PISCES</b>			
1	<i>Pseudoscaphirhynchus kaufmannii</i> Bogdanow	33	<i>Neophron percnopterus</i> L.
2	<i>Pseudoscaphirhynchus fedtschenkoi</i> Kessler	34	<i>Aquila chrysaetus daphanea</i> Menzbier
3	<i>Aspiolucius esocinus</i> Kessler	35	<i>Aquila pennata pennata</i> Gmelin
4	<i>Barbus brachycephalus</i> Kessler	36	<i>Accipiter nisus melaschistos</i> Hume
<b>REPTILIA</b>			
5	<i>Crossobamon eversmanni</i> Weigmann	37	<i>Falco cherrug coatsi</i> Dementijev
6	<i>Teratoscincus scincus rustamowi</i> Szczerbak.	38	<i>Falco cherrug milvipes</i> Jerdon
7	<i>Gymnodactylus caspius</i> Eichwald	39	<i>Falco peregrinus babylonicus</i> Sclat.
8	<i>Alsophylax loricatus loricatus</i> Strauch	40	<i>Ammoperdix griseogularis</i> Brandt
9	<i>Phrynocephalus helioscopus said-alievi</i> Szczerbak et Satt.	41	<i>Perdix daurica turcomana</i> Stolzm.
10	<i>Phrynocephalus sogdianus</i> Cern.	42	<i>Tetraogallus tibetanus</i> Gould.
11	<i>Phrynocephalus mystaceus</i> Pallas	43	<i>Phasianus colchicus</i> L.
12	<i>Varanus griseus</i> Daudin	44	<i>Otis tarda tarda</i> L.
13	<i>Eremias scripta pherganensis</i> Szczerbak et Washenko	45	<i>Otis undulata macqueeni</i> Gray
14	<i>Eremias scripta</i> Str.	46	<i>Burhinus oedicephalus astutus</i> Hartert
15	<i>Eremias grammica</i> Licht.	47	<i>Charadrius mongolus pamirensis</i> Richmond
16	<i>Ablepharus deserti</i> Strauch	48	<i>Ibidorhyncha struthersi</i> Vigors
17	<i>Ablepharus alaicus</i> Elpat.	49	<i>Glareola pratincola</i> L.
18	<i>Eumeces schneideri</i> Daudin	50	<i>Larus brunnecephalus</i> Jerd.
19	<i>Typhlops vermicularis</i> Merrem	51	<i>Columba palumbus casiotis</i> Bp.
20	<i>Eryx tataricus</i> Lichtenstein	52	<i>Columba leuconota</i> Vig.
21	<i>Lycodon striatus bicolor</i> Nicolosky	53	<i>Pterocles orientalis arenarius</i> Pallas
22	<i>Boiga trigonatum melanocephala</i> Annan.	54	<i>Syrnhartes tibetana</i> Gould.
23	<i>Naja oxiana</i> Eichward	55	<i>Apus affinis galilejensis</i> Antorini
24	<i>Vipera lebetina turanica</i> Cernow	56	<i>Garrulax lineatus bilkevitchi</i> Zarud.
25	<i>Echis carinatus</i> Schneider	57	<i>Terpsiphone paradisi leucogaster</i> Swain.
<b>AVES</b>			
26	<i>Ciconia ciconia asiatica</i> Severtzov	58	<i>Muscicapa ruficauda</i> Swainson
27	<i>Ciconia nigra</i> L.	59	<i>Microcichla scouleri scouleri</i> Vigors
28	<i>Anser indicus</i> Lath.	60	<i>Chaimarrornis leucocephala</i> Vigors
29	<i>Gyps himalayensis</i> Hume	61	<i>Myophonus coeruleus turkestanicus</i> Zarudny
30	<i>Gypaetus barbatus hemachalanus</i> Hutt	62	<i>Leptopoeile sophiae sophiae</i> Severtzov
31	<i>Circaetus ferox heptneri</i> Dementijev	<b>MAMMALIA</b>	
32	<i>Pandion haliaetus</i> L.	63	<i>Paraechinus hypomelas hypomelas</i> Brandt
		64	<i>Sorex buchariensis</i> Ognev
		65	<i>Suncus etruscus</i> Savi
		66	<i>Crocidura pergrisea</i> Miller
		67	<i>Rhinolophus hipposideros</i> Bechstein
		68	<i>Rhinolophus ferrumequinum</i> Schreber

1.19.

1	2
69	<i>Rhinolophus bocharicus</i> Kastch. et Ak.
70	<i>Nyctalus noctula</i> Schreb.
71	<i>Myotis emarginatus</i> Geoffroy
72	<i>Myotis mystacinus</i> Kuhl
73	<i>Plecotus auritus</i> L.
74	<i>Barbastella darjelingensis</i> Pobson
75	<i>Vespertilio savii</i> Bonaparte
76	<i>Vespertilio serotinus</i> Schreber
77	<i>Eptesicus ognevi</i> Bobrinskoy
78	<i>Eptesicus serotinus turcomanus</i> Eversmann
79	<i>Otonycteris hemprichi</i> Peters
80	<i>Tadarida teniotis teniotis</i> Rafinesque
81	<i>Spermophilopsis leptodactylus bactrianus</i> Scully
82	<i>Marmota menzbieri</i> Aschk.
83	<i>Citellus fulvus oxianus</i> Thomas
84	<i>Hystrix leucura satunini</i> Muller
85	<i>Allactaga severtzovi</i> Vinogradov
86	<i>Allactaga elater</i> Lichtenstein
87	<i>Vulpes corsac turkmenica</i> Ognev

1.19.

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88	<i>Ursus arctos isabellinus</i> Horsfield
89	<i>Mustela nivalis pallida</i> Barrett-Hamilton; <i>M.n. heptneri</i> L. Turova
90	<i>Mustela altaica sacana</i> Thomas
91	<i>Mustela Putorius eversmanni talassica</i> Ognev.
92	<i>Vormela peregusna koshevnikov</i> Satunin
93	<i>Lutra lutra seistanica</i> Birula
94	<i>Hyaena hyaena</i> L.
95	<i>Felis chaus oxiana</i> Heptner
96	<i>Felis lynx isabellina</i> Blyth
97	<i>Panthera tigris virgata</i> Illiger
98	<i>Panthera pardus ciscaucasica</i> Satunin
99	<i>Uncia uncia</i> Schreber
100	<i>Gazella subgutturosa</i> Guldenstaedt
101	<i>Capra falconeri heptneri</i> Zalkin
102	<i>Ovis vignei bochariensis</i> Nasonov; <i>O.v. severtzovi</i> Nasonov
103	<i>Ovis ammon polii</i> Blyth
104	<i>Cervus elaphus bactrianus</i> Lydekker



Pamir