

RED LIST ASSESSMENT

Questionnaire

(please complete one questionnaire per taxon, extra sheets may be used)

1a. Scientific name (including authority details):

Panthera pardus ciscaucasica (Satunin, 1914)

1b. Synonym/s (if there has been a taxonomic change in the last 5 years or if widely used):

Panthera pardus saxicolor Pocock, 1927

1c. English Common Name (if known):

Caucasian leopard (*P. p. ciscaucasica*), Persian leopard (*P. p. saxicolor*)

1d. Other Common Names (if known and state language):

Leopard, bars (Russian North Caucasus); potskhveri (Georgia); bebir (Azerbaijan); hovaz, indzariuts (Armenia); pars (Turkey); palang (Iran); bars (Turkmenistan); palang, prang (Afghanistan). In Turkic-language countries and some localities in non-Turkic countries (e.g., in Armenia), a vernacular name "kaplan", "qaplan" or "ghaplan" is frequently used which means "tiger" or "leopard".

2a. Order

Carnivora

2b. Family

Felidae

3. Distribution

Describe the range in terms of countries of occurrence, subcountry units (e.g., states, provinces, etc.). For an inland water taxon, record the name/s of lakes, river systems, etc. in which it occurs. For a marine taxon, record names of estuaries, territorial waters, FAO fisheries areas:

Russian North Caucasus: mountain ridges in the headwaters of the Avarscoe Koisu and Andiiskoe Koisu rivers (Republic of Dagestan). Possibly exists in the Chegem River canyon (Kabardino-Balkarian Republic); Erzi Reserve, Assa River valley (Republic of Ingushetia); Armkhi River basin (Republic of North Osetia-Alania), headwaters of the Sharoargun and Argun rivers (Chechen Republic) (Akkiev & Mokaev, 2006; Khorozyan & Abramov, 2007; Lukarevsky et al., 2007a).

Georgia: Vashlovani Reserve in the south-east; Arkhoti River canyon in the upper part of the Assa River basin and the headwaters of the Andiiskoe Koisu River in the north-east (Lukarevsky et al., 2007a). Some anecdotal records from south-western Georgia are either unreliable or can be attributed to individuals coming from north-eastern Turkey (Arabuli, 2006; Khorozyan & Abramov, 2007).

Armenia: south-western and southern parts of the country from Khosrov Reserve to the Armenian-Iranian state border throughout the Geghama, Zangezur, Aiotsdzor, Bargushat and Meghri ridges. The range boundaries are the Azat River in the north-west; Vardenis Ridge in the north; semi-desert of the Ararat Valley in the west; state border with Azerbaijan and the alpine meadow/nival belt transition zone in the south-west and east; Arax River basin along the Armenian-Iranian border in the south. Until the early 1970s it lived also in north-eastern parts of Armenia (Khorozyan et al., 2005; Khorozyan & Abramov, 2007).

Azerbaijan: Talysh Mts. in the extreme south-east, Akhar-Bakhar Ridge of the Iori-Mingechaur Highland in the north-west and the Zangezur Ridge in the Nakhichevan Republic along the state border with Armenia in the west (Lukarevsky et al., 2007a).

Nagorno-Karabakh Republic: distribution in Shushi, Mardakert and Hadrut districts and in the

adjoining Kelbajar district was recorded in 1941-1967 (Aleksperov, 1966; Sludsky, 1973). Up-to-date information on leopard status is impossible to obtain for the political tension between Armenia and Azerbaijan over this republic, even though it plays a vital role as a corridor between the southern (Armenia, Azerbaijan's Nakhichevan Republic), central (Iori-Mingechaur Highland in Azerbaijan and Vashlovani Reserve in Georgia) and northern (Russian North Caucasus) parts of the Caucasus (Khorozyan & Abramov, 2007).

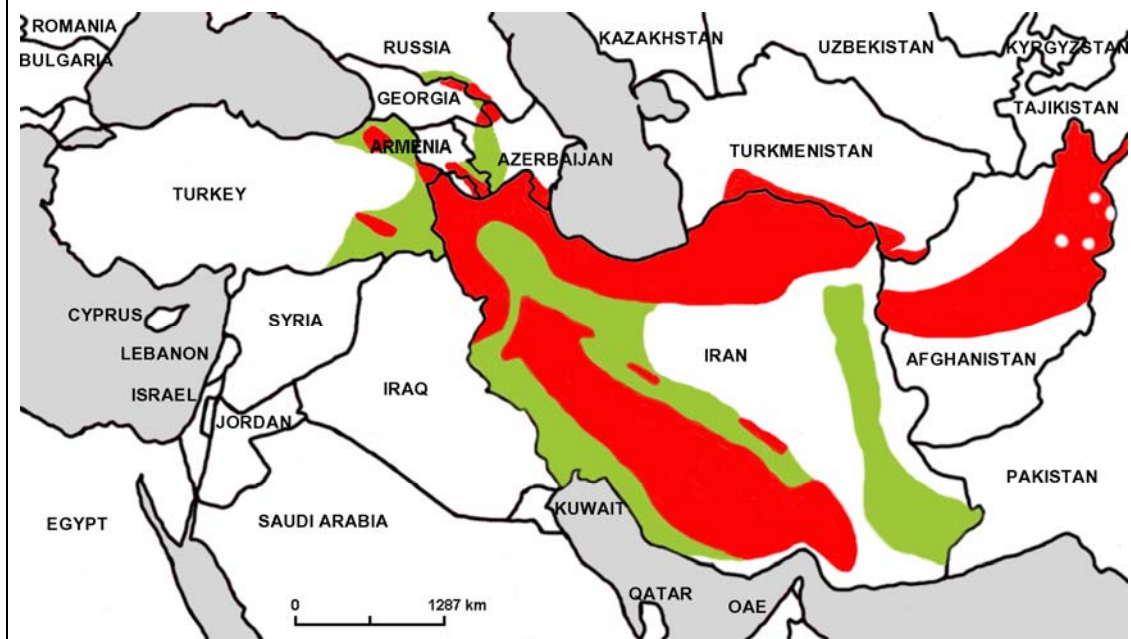
Iran: virtually all country, except the vast deserts of Desht-e-Kevir and Desht-e-Lut in central and eastern parts. Particularly common in the Alborz Mts. along the southern fringe of the Caspian Sea. Quite common in protected areas (e.g., Tandooreh, Sarigol, Bafgh, Golestan, Kolah'ghazy, Touran, Kavir, Khojir, Khabr and Bamu national parks; Kiamaki and Naybandan wildlife refuges; Jahan Nama, Central Alborz, Varjin, Arasbaran, Dena and Bahram'gur protected areas) and some unprotected lands (Chapur-Ghoymeh, Safee Abad-Dozain or Minoo Dasht, Ramsar, Khaeez and Darestan-Rudbar) (Joslin, 1990; Kiabi et al., 2002; Farhadinia, 2007-2008; Abdoli et al., 2008; Ghoddousi, 2008). Possibly, southern part of Iran (Zagros Mts.) has been inhabited by *P. p. sindica* Pocock, 1930 – see the section 9a. Taxonomy below.

Turkey: north-east (around the Artvin city), east (vicinities of Mt. Ararat or Agri) and south-east (Bitlis Ridge). Possibly exists in the mountains of the Black Sea coast and south-westwards to the Taurus Mts. (Diker, 2008). The linkage between eastern and western (terra typica of the Anatolian leopard *P. p. tulliana* (Valenciennes, 1856) parts of Turkey is not found – see the section 9a. Taxonomy below.

Turkmenistan: western Kopetdag Ridge, central Kopetdag Ridge, eastern Kopetdag Ridge, Badkhyz Reserve and Giaz-Gyadyk Ridge (Lukarevsky, 2001).

Afghanistan: central (Hindu Kush, Kohe Baba, Kohe Paghman and Safed Koh ranges of the central highlands), north-eastern (Wakhan corridor) and northern (Darkad peninsula of Badakshan) parts of the country (Habibi, 2004). It is unknown if *P. p. ciscaucasica* inhabits only western part closer to the border with Iran or merges with *P. p. sindica* and/or *P. p. millardi* Pocock, 1930 (synonyms?) in the south - see the section 9a. Taxonomy below.

The areas of certain existence are coloured by red and the areas of possible existence are green (Lukarevsky, 2001; Kiabi et al., 2002; Habibi, 2004; Khorozyan & Abramov, 2007; Diker, 2008).



3a. Red List Assessment (Red List assessment using IUCN Red List Categories and Criteria: version 3.1. (IUCN 2001)). Cross (X) one of the following categories:

- Extinct (EX)
- Extinct in the Wild (EW)
- Critically Endangered (CR)
- Endangered (EN)
- Vulnerable (VU)
- Near Threatened (NT)
- Least Concern (LC)
- Data Deficient (DD)
- Not Evaluated (NE)

3b. Red List Criteria (For threatened taxa (i.e., those assessed as CR, EN or VU) record which criteria are met (e.g., A2c+3c; B1ab(iii); D) alongside the appropriate Category. For NT taxa, record criteria nearly met):

C2a(i)

Note: If one of the threatened categories is selected (i.e. CR, EN or VU) then **ALL** the criteria, subcriteria and sub-subcriteria met for that category, must be listed in the box provided.

4. Rationale for the Red List Assessment (record the reasons why the taxon is assessed as above, including any population or range information used, inferences, assumptions, etc. For NT specify what criteria were nearly met and for DD specify what little information is known. Use additional sheets if necessary):

<p>Total population size of the Caucasian leopard is unlikely to exceed 1300 mature individuals. This ceiling value is derived by summing up the top values of the up-to-date or most recent guesstimates for each range country which include mature individuals, sub-adults and cubs: 550-850 in Iran; 200-300 (?) in Afghanistan; 78-90 in Turkmenistan; <10-13 in Armenia; <10-13 in Azerbaijan; 3-4 in Nagorno-Karabakh; <5 in Georgia; < 10 in Russian North Caucasus; < 5 in Turkey (Khorozyan et al., 2005; Lukarevsky et al., 2007a).</p> <p>The most urgent threat to the Caucasian leopard is ever-increasing fragmentation of population into the patchy network of distant and often too small sub-populations. Not a single sub-population across the entire range is believed to contain more than 100 mature individuals. Prey reduction from poaching, infrastructure development, disturbance and habitat loss (collection of edible plants and mushrooms, mining, road construction, deforestation, wild fire and livestock grazing) is the principal factor of fragmentation that leaves vast tracts of mountainous habitats unsuitable for resident leopard sub-populations. The inter-patch hostile environments can be crossed by dispersing sub-adult leopards, but such movements are risky and often end up with killings of predators that actually or allegedly kill livestock in order to survive (Khorozyan et al., 2005; Lukarevsky et al., 2007a). Only handful of protected areas (all concentrated in Iran) is large enough to maintain viable leopard sub-populations.</p> <p>Mountainous habitats are naturally discontinuous and patchy what aggravates the impacts of fragmentation.</p> <p>Direct poaching occurs as trophy hunting for sales on fur markets (Afghanistan), shooting to alleviate predation on livestock (Iran, Turkmenistan) and killings upon the encounters (Caucasus, eastern Turkey) (Lukarevsky, 2001; Mishra & Fitzherbert, 2004; Farhadinia et al., 2007; Khorozyan & Abramov, 2007). It is not widespread, but makes a substantial impact on population viability due to small population size. This is especially true in the Caucasus where</p>
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population is thinly distributed over the vast areas and removal of just one individual delays replenishment by immigrants and hampers overall demographic stabilization. As a result, even in optimal prey-rich areas (e.g., in southern Armenia) actual leopard density is much lower than predicted from prey abundance (Khorozyan, 2008a, submitted).

Political conflict between Armenia and Azerbaijan over Nagorno-Karabakh Republic (warfare ceased in 1995) entails the factors that boost poaching: military training and testing grounds, border posts, intensification of agriculture and mining in safety zones and re-settling of previously abandoned villages (Khorozyan, 2008b, submitted).

Iran is the leopard stronghold in the Middle East which supports viability of the leopard populations in the Caucasus, eastern Turkey and, possibly, in Turkmenistan through the transboundary emigrations (Khorozyan & Abramov, 2007). However, even here the crude leopard density is low – 0.06-0.1 individual/100 km² based on guesstimates in Kiabi et al. (2002) (population size 550-850 over 885300 km²).

Leopard occurrence is inversely related to human densities and, hence, to settlements and infrastructure throughout the region (Gavashelishvili & Lukarevskiy, 2008; Khorozyan, 2008b, submitted)

Overall, the Caucasian leopard can be classified as EN C2a(i) in Iran, Afghanistan and Turkmenistan and CR D in the Caucasus and eastern Turkey. As the Caucasus and eastern Turkey represent the marginal parts of the global range of *P. p. ciscaucasica*, the Red List Assessment of this taxon should be based on its status in the core area, i.e. in Iran.

5. Reason for Change from previous Red List assessment (if the taxon has changed Red List category from a previous assessment, record the reasons for this change (see www.redlist.org)). Indicate with a cross (x) at least one of the following:

- | | |
|--|---|
| <input type="checkbox"/> Genuine change in status of species | <input type="checkbox"/> New or better information available |
| <input type="checkbox"/> Incorrect information used previously | <input type="checkbox"/> Taxonomic change affecting the species |
| <input type="checkbox"/> Previously incorrect application of the Red List Criteria | |

6. Current Population Trend (cross (x) one of the following):

- | | | | |
|-------------------------------------|-------------------------------------|---------------------------------|---|
| <input type="checkbox"/> Increasing | <input type="checkbox"/> Decreasing | <input type="checkbox"/> Stable | <input checked="" type="checkbox"/> Unknown |
|-------------------------------------|-------------------------------------|---------------------------------|---|

7. Date of Assessment (day/month/year):

11	04	2008
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8a. Name/s of the Assessor/s

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8b. Names of the Evaluators - to be filled in By Red List Authority ONLY
 (at least TWO evaluators, and the name of the Red List Authority)

9. Text documentation

Brief notes (i.e., a short narrative, on the topics below to complement the information entered above or on the Authority Files in Annex 1 (use additional sheets if required).

9a. Taxonomy (any taxonomic notes of relevance - optional):

Craniological and molecular genetic studies by Miththapala (1992), Miththapala et al. (1996) and Uphyrkina et al. (2001) reliably indicate the taxonomic distinctiveness of the Arabian leopard *P. p. nimr* (Hemprich & Ehrenberg, 1833), but provide a scientifically poorly justified conclusion that all the Middle East outside of the Arabian Peninsula is inhabited by one subspecies – Persian leopard *P. p. saxicolor*. Even if their conclusion were correct, in accordance with the International Code of Zoological Nomenclature (1999) the subspecies would have to be called *P. p. tulliana* as the oldest of all valid names given to it. Meanwhile, the authors used only samples from captive Persian leopards and did not use those from wild or captive individuals of other races described from the region. Captive Persian leopards descend from 15 individuals captured in 1955-1975 in northern Iran and Afghanistan (Shoemaker, 2006) and are moderately to highly inbred as no new wild bloodlines were introduced since then (Shoemaker, 1982; Shoemaker & Wharton, 1984). The two males captured in Russian North Caucasus in 2001 and brought to the Novosibirsk Zoo are not bred yet. Also, at least some of captive Persian leopards are supposed to be hybrid as mixed with other leopard races (Chelomina et al., 1999).

Recent craniological study has revealed the taxonomic identity of leopards from the Caucasus, Iran (at least its northern part) and Turkmenistan, so its scientific name should be the Caucasian leopard *P. p. ciscaucasica* as the first one introduced by Russian naturalist K. Satunin in 1914 (Khorozyan et al., 2006). The commonly used name Persian leopard *P. p. saxicolor* is the junior synonym introduced later, in 1927, by British naturalist R. Pocock.

Comparison of skulls of *P. p. ciscaucasica* and *P. p. tulliana* from the Mediterranean part of south-western and western Turkey have shown their taxonomic difference (Khorozyan et al., 2006). If both they were identical, then the name of the taxon would have to be changed to *P. p. tulliana* as the older one. Eastern Turkey has been inhabited by *P. p. ciscaucasica* as revealed recently by molecular genetic research (Fernandes, 2008) and this is well justified by biogeographical unity of eastern Turkey, Caucasus, Iran and Turkmenistan as the common range for one leopard subspecies. No leopard records and, hence, no materials are found at all in central Turkey which would shed light on the linkage between *P. p. ciscaucasica* and *P. p. tulliana*. So, both subspecies can really have disjunct ranges separated in central Turkey (Khorozyan et al., 2006).

We also found possible separation of leopard subspecies in Iran: *P. p. ciscaucasica* in northern Iran and *P. p. sindica* in southern Iran. Fernandes (2008) also found surprising genetic diversity of leopards within Iran. Whether or not the split between *P. p. ciscaucasica* and *P. p. sindica* is valid is still unclear, as much more material is needed to verify the pattern.

Taxonomic position of leopard in Afghanistan is poorly understood, but the sample of Afghan leopard analyzed by Fernandes (2008) did not differ from Iranian leopards, i.e. *P. p. ciscaucasica*.

9b. Geographic Range (including mention of important sites, and if known specify the extent of occurrence and area of occupancy):

Distribution – see section 3. Distribution.

The patterns of the extent of occurrence and the area of occupancy of the Caucasian leopard are studied in Armenia. Here, the contemporary extent of occurrence calculated from the GIS maps of potential habitats is 7497.2 km² or 25.2% of the territory of Armenia (Khorozyan et al., 2005). The area of occupancy is only 2856.8 km² (9.6%) which includes the areas of permanent or temporary existence and corridors (Khorozyan, 2008b, submitted).

9c. Population (for example, population size, abundance (rare, scarce, common, etc.), number and size of subpopulations if known, number of locations and degree of fragmentation):

Distribution – see section 3. Distribution

Population size – see section 4. Rationale for the Red List Assessment

By the mid-1950s the leopard has become extinct in the western part of Russian North Caucasus. Since then, only transient individuals have been seldom recorded in central North Caucasus (Akkiev & Mokaev, 2006; Khorozyan & Abramov, 2007). In the early 1970s the cat has vanished from northern Armenia (Khorozyan & Abramov, 2007). The ambitious project on leopard reintroduction in the Kavkazsky (Caucasus) Reserve in the western Russian North Caucasus is underway (Lukarevsky et al., 2007a). The leopard status in Dagestan has been studied since the early 2008 (Yarovenko, 2008).

The pattern of population fragmentation is studied in Armenia. Here, the only two areas where predators live permanently (central and eastern parts of Khosrov Reserve, 207.9 km² and the Nuvadi area, 296.9 km²) are located in the extreme north-western and south-eastern parts of the area of occupancy, respectively, and separated by the network of rather narrow interwoven corridors. Such a spatial structure of leopard population makes it entirely dependent on functioning of corridors (Khorozyan, 2008b, submitted).

9d. Habitat and Ecology (including particulars about breeding ecology if relevant):

Habitats include arid grasslands; dense broadleaf humid and sparse xerophilous forests; mountain, subalpine and alpine meadows. The last three habitats are used only for movements during the snow-free seasons. Snow cover is a significant limiting factor, so leopards and their prey prefer those habitats (e.g., arid grasslands and xerophilous sparse forests in Armenia) which are spread over the southern slopes (Khorozyan, 2008b, submitted). Availability of hardly accessible and precipitous rocky massifs is essential as they provide home for staple prey (bezoar goat), shelters for ambush hunting and rest, and are least accessible by humans and domestic animals. Diet includes the bezoar goat (*Capra aegagrus*), wild boar (*Sus scrofa*), roe deer (*Capreolus capreolus*), East Caucasian or Dagestan tur (*Capra cylindricornis*), chamois (*Rupicapra rupicapra*), goitered gazelle (*Gazella subgutturosa*), wild sheep (*Ovis* spp.), Indian porcupine (*Hystrix indica*), Afghan pika (*Ochotona rufescens*) and European hare (*Lepus europaeus*) (Danov, 1985; Lukarevsky, 2001; Khorozyan et al., 2005; Khorozyan & Abramov, 2007; Lukarevsky et al., 2007b; Mallon et al., 2007; Abdoli et al., 2008; Ghoddousi, 2008).

9e. Threats (the main threats to the species, and if known, the severity and extent):

The most severe threat is fragmentation caused by prey reduction in inter-patch human-dominated landscapes from poaching, infrastructure development, disturbance and habitat loss. Direct poaching is smaller in scales, but poses a great risk for small sub-populations.

9f. Conservation Actions (including presence in protected areas and national/international legislation):

The leopard exists in the following protected areas:

Russian North Caucasus: Erzi Reserve (Republic of Ingushetia), Kabardino-Balkarian Reserve and possibly Prielbrusie National Park (Kabardino-Balkarian Republic).

Georgia: Vashlovani Reserve.

Armenia: Khosrov Reserve, Shikahogh Reserve.

Azerbaijan: Hirkan National Park, Ordubad National Park, Ilisu Reserve.

Nagorno-Karabakh Republic: none.

Iran: most of the country's protected areas.

Eastern Turkey: no information.

Turkmenistan: Syunt-Khasardag Reserve, Kopetdag Reserve, Badkhyz Reserve.

Afghanistan: no information.

Given the high threat of population fragmentation, the most efficient conservation measure would be the maintenance of prey-rich habitat integrity through the network of big (reserves,

national parks) and small (sanctuaries) protected areas. Such efforts are underway, particularly in Armenia where the programs on establishment of new reserves, national parks, natural parks and sanctuaries are approved.

g. Utilization (Is the taxon utilized in any way, e.g., medicinal uses, food, building material, etc.? Which parts are utilized? Is there a local, national or international trade in the taxon?)

Nowadays, in Turkey leopard skins have been openly displayed in public places, e.g. cafes (Kasperek, 2007). On Afghanistan's markets leopard skins represent the second most popular product of fur trade (Mishra & Fitzherbert, 2004). In the Caucasus, poached leopards have been treated very secretly to avoid official punishment and, most often, their skins go undetected to some rich people for money. In Iran, leopards have been occasionally shot or poisoned to mitigate the conflict with animal husbandry, but whether the poachers are motivated to earn money from skins is unknown (Ghoddousi, 2008).

10. Literature References (cited in full) used for the assessment and documentation:

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Annex 1. Authority Files For Habitats, Threats and Conservation Actions and Utilization

This annex contains four Authority Files with standard categories to be used for documenting (a) the major habitats a taxon occurs in; (b) the major threats to the taxon (past, present and future); (c) what conservation actions are in place or are required for the taxon; and (d) information about the utilization of the taxon (locally, nationally or internationally). More detailed descriptors of the Authority File terms are being developed, and will be available in due course.

A. Habitats Authority File (Version 2.1)

This two-tiered habitat classification system is based on a climatic and biogeographic classification using Holdridge's life zones as a basis. The aquatic habitats (inland, marine and artificial) are based primarily on the classification system of wetland types used by the Ramsar Convention (see http://www.ramsar.org/key_ris_types.htm). The aquatic habitats are under review, particularly the marine ones, as these are far too simplistic a view of the marine environment. The categories are numbered to indicate their level in the hierarchy e.g., 1. Forest and 1.1 Boreal Forest.

There is a third level to the classification which is based on the Global Land Cover Characterization (GLCC) developed by the US Geological Survey's (USGS) Earth Resources Observation System (EROS) Data Center, the University of Nebraska-Lincoln (UNL) and the Joint Research Centre of the European Commission (see <http://edcdaac.usgs.gov/glcc/glcc.html>). This third level is not shown here, because without access to the Species Information Service (SIS) database or the GLCC maps, it is impossible for users to accurately record habitats at this level.

In using this classification, assessors are asked to indicate in which habitats their taxon is found. This is done by means of a simple scoring system:

- 1 = Suitable (main or preferred habitat/s, habitat/s containing major subpopulations, habitat/s with high population densities)
- 2 = Moderately suitable (secondary habitat/s, habitat/s containing minor subpopulations, habitat/s with low population densities)
- 9 = Undefined (data deficient, possibly suitable or moderately suitable as inferred from the ecology of the taxon)

It is important to note that if a higher level in the hierarchy is scored, this automatically implies that all the habitat types nested below that level are also scored (e.g., scoring Forest, means that all the forest types i.e. 1.1. to 1.9 are scored). This will not be the intention in most cases. Users are therefore encouraged to select the appropriate habitat type from the lowest level in the hierarchy wherever possible.

If 'Other' is selected, the habitat type must be specified. Multiple additions under 'Other' are allowed, although extensive use of this is not encouraged. If the habitat is not known, please indicate this using a score of 9 under category '15. Unknown'.

Score: **1** = primary habitat type; **2** = secondary habitat type; **9** = possibly suitable habitat

Habitat Type	Score
1. Forest	
1.1. Boreal	
1.2. Subarctic	
1.3. Subantarctic	
1.4. Temperate	2
1.5. Subtropical/Tropical Dry	1
1.6. Subtropical/Tropical Moist Lowland	1
1.7. Subtropical/Tropical Mangrove	
1.8. Subtropical/Tropical Swamp	
1.9. Subtropical/Tropical Moist Montane	
2. Savanna	
2.1. Dry	
2.2. Moist	
3. Shrubland	
3.1. Subarctic	
3.2. Subantarctic	
3.3. Boreal	
3.4. Temperate	1
3.5. Subtropical/Tropical Dry	1
3.6. Subtropical/Tropical Moist	
3.7. Subtropical/Tropical High Altitude	
3.8. Mediterranean-type Shrubby Vegetation	
4. Grassland	
4.1. Tundra	
4.2. Subarctic	
4.3. Subantarctic	
4.4. Temperate	
4.5. Subtropical/Tropical Dry Lowland	1
4.6. Subtropical/Tropical Seasonally Wet/Flooded Lowland	
4.7. Subtropical/Tropical High Altitude	
5. Wetlands (inland)	
5.1. Permanent Rivers/Streams/Creeks [includes waterfalls]	
5.2. Seasonal/Intermittent/Irregular Rivers/Streams/Creeks	
5.3. Shrub Dominated Wetlands	
5.4. Bogs, Marshes, Swamps, Fens, Peatlands	
5.5. Permanent Freshwater Lakes [over 8 ha]	
5.6. Seasonal/Intermittent Freshwater Lakes [over 8 ha]	
5.7. Permanent Freshwater Marshes/Pools [under 8 ha]	
5.8. Seasonal/Intermittent Freshwater Marshes/Pools [under 8 ha]	
5.9. Freshwater Springs and Oases	
5.10. Tundra Wetlands [includes pools and temporary waters from snowmelt]	

5.11. Alpine Wetlands [includes temporary waters from snowmelt]	
5.12. Geothermal Wetlands	
5.13. Permanent Inland Deltas	
5.14. Permanent Saline, Brackish or Alkaline Lakes	
5.15. Seasonal/Intermittent Saline, Brackish or Alkaline Lakes and Flats	
5.16. Permanent Saline, Brackish or Alkaline Marshes/Pools	
5.17. Seasonal/Intermittent Saline, Brackish or Alkaline Marshes/Pools	
5.18. Karst and Other Subterranean Hydrological Systems [inland]	
6. Rocky Areas [e.g. inland cliffs, mountain peaks]	1
7. Caves and Subterranean Habitats (non-aquatic)	
7.1. Caves	
7.2. Other Subterranean Habitats	
8. Desert	
8.1. Hot	
8.2. Temperate	
8.3. Cold	
9. Sea	
9.1. Open	
9.2. Shallow [usually less than 6 m deep at low tide; includes sea bays and straits]	
9.3. Subtidal Aquatic Beds [kelp beds, sea- grass beds and tropical marine meadows]	
9.4. Coral Reefs	
10. Coastline	
10.1. Rocky Shores [includes rocky offshore islands and sea cliffs]	
10.2. Sand, Shingle or Pebble Shores [includes sand bars, spits, sandy islets, dune systems]	
10.3. Estuarine Waters	
10.4. Intertidal Mud, Sand or Salt Flats	
10.5. Intertidal Marshes [includes salt marshes]	
10.6. Coastal Brackish/Saline Lagoons	
10.7. Coastal Freshwater Lagoons	
10.8. Karst and Other Subterranean Hydrological Systems [marine/coastal]	
11. Artificial - Terrestrial	
11.1. Arable Land	
11.2. Pastureland	
11.3. Plantations	
11.4. Rural Gardens	
11.5. Urban Areas	
11.6. Subtropical/Tropical Heavily Degraded Former Forest	
12. Artificial - Aquatic	
12.1. Water Storage Areas (over 8 ha)	
12.2. Ponds (below 8 ha)	
12.3. Aquaculture Ponds	
12.4. Salt Exploitation Sites	

12.5. Excavations (open)	
12.6. Wastewater Treatment Areas	
12.7. Irrigated Land [includes irrigation channels]	
12.8. Seasonally Flooded Agricultural Land	
12.9. Canals and Drainage Channels, Ditches	
12.10. Karst and Other Subterranean Hydrological Systems [human-made]	
13. Introduced Vegetation	
14. Other	9
15. Unknown	

If you have selected "14. Other" for habitat type, please note details here:
Mountain, subalpine and alpine meadows are used by leopards occasionally for transient movements during the snow-free seasons.

B. Major Threats (Version 2.1)

In using this hierarchical classification of causes of species decline, assessors are asked to **indicate the threats that triggered the listing of the taxon concerned**. These threats could be in the past and/or present and/or future, using a time frame of three generations or ten years, whichever is longer (not exceeding 100 years in the future) as in the Red List Criteria. Selecting past, present and future for any threat implies that it is ongoing. In this hierarchy, unlike that for the habitats, selection of a higher level threat e.g., 1.1. Agriculture, does not imply that all the threats below this e.g., 1.1.1 Crops to 1.1.7 Freshwater aquaculture, are indicated. It simply indicates that some unspecified form of agriculture is leading to habitat loss or habitat degradation for the taxon concerned. Selection of any threat category lower down the hierarchy automatically implies that the higher levels are indicated, i.e. it is not necessary to indicate all the levels met. For example, selecting threat 1.1.4.1. Nomadic, indicates that nomadic livestock is an agricultural activity (threat 1.1.) that causes habitat loss or degradation (threat 1.). It is very important for users to check the hierarchy above the level indicated to ensure that the correct threat is selected because similar terms (e.g., fire) are used in more than one place in the classification. Multiple threats can be selected as required. If 'Other' is selected, the threat or cause of the decline must be specified. Multiple additions under 'Other' are allowed, although extensive use of this is not encouraged. If no threats to the taxon are known (past and/or present and/or future this should be recorded against threat category 0. To indicate the threats use: **Yes** or **Y** or **X**.

Threat	Past	Present	Future
0. No threats			
1. Habitat loss/degradation (human induced)			
1.1. Agriculture			
1.1.1. Crops			
1.1.1.1. Shifting agriculture			
1.1.1.2. Small-holder farming			
1.1.1.3. Agro-industry farming			
1.1.2. Wood plantations			
1.1.2.1. Small-scale			
1.1.2.2. Large-scale			
1.1.3. Non-timber plantations			
1.1.3.1. Small-scale			
1.1.3.2. Large-scale			
1.1.4. Livestock			
1.1.4.1. Nomadic			
1.1.4.2. Small-holder	X	X	X
1.1.4.3. Agro-industry			
1.1.5. Abandonment			
1.1.6. Marine aquaculture			
1.1.7. Freshwater aquaculture			
1.1.8. Other			
1.1.9. Unknown			
1.2. Land management of non-agricultural areas			
1.2.1. Abandonment			
1.2.2. Change of management regime			
1.2.3. Other			

1.2.4. Unknown			
1.3. Extraction			
1.3.1. Mining	X	X	X
1.3.2. Fisheries			
1.3.2.1. Subsistence			
1.3.2.2. Artisanal/small-scale			
1.3.2.3. Large-scale/industrial			
1.3.3. Wood			
1.3.3.1. Small-scale subsistence	X	X	X
1.3.3.2. Selective logging			
1.3.3.3. Clear-cutting			
1.3.4. Non-woody vegetation collection			
1.3.5. Coral removal			
1.3.6. Groundwater extraction			
1.3.7. Other			
1.3.8. Unknown			
1.4. Infrastructure development			
1.4.1. Industry			
1.4.2. Human settlement	X	X	X
1.4.3. Tourism/recreation			
1.4.4. Transport - land/air	X	X	X
1.4.5. Transport – water			
1.4.6. Dams			
1.4.7. Telecommunications			
1.4.8. Power lines			
1.4.9. Other			
1.4.10. Unknown			
1.5. Invasive alien species (directly impacting habitat)			
1.6. Change in native species dynamics (directly impacting habitat)			
1.7. Fires	X	X	X
1.8. Other causes			
1.9. Unknown causes			
2. Invasive alien species (directly affecting the species)			
2.1. Competitors			
2.2. Predators			
2.3. Hybridizers			
2.4. Pathogens/parasites			
2.5. Other			
2.6. Unknown			
3. Harvesting [hunting/gathering]			
3.1. Food			

3.1.1. Subsistence use/local trade			
3.1.2. Sub-national/national trade			
3.1.3. Regional/international trade			
3.2. Medicine			
3.2.1. Subsistence use/local trade			
3.2.2. Sub-national/national trade			
3.2.3. Regional/international trade			
3.3. Fuel			
3.3.1. Subsistence use/local trade			
3.3.2. Sub-national/national trade			
3.3.3. Regional/international trade			
3.4. Materials			
3.4.1. Subsistence use/local trade			
3.4.2. Sub-national/national trade (skins)	X	X	X
3.4.3. Regional/international trade			
3.5. Cultural/scientific/leisure activities			
3.5.1. Subsistence use/local trade			
3.5.2. Sub-national/national trade			
3.5.3. Regional/international trade			
3.6. Other			
3.7. Unknown			
4. Accidental mortality			
4.1. Bycatch			
4.1.1. Fisheries-related			
4.1.1.1. Hooking			
4.1.1.2. Netting			
4.1.1.3. Entanglement			
4.1.1.4. Dynamite			
4.1.1.5. Poisoning			
4.1.2. Terrestrial			
4.1.2.1. Trapping/snaring/netting			
4.1.2.2. Shooting	X	X	X
4.1.2.3. Poisoning			
4.1.3. Other			
4.1.4. Unknown			
4.2. Collision			
4.2.1. Pylon and building collision			
4.2.2. Vehicle collision			
4.2.3. Other			
4.2.4. Unknown			
4.3. Other			

4.4. Unknown			
5. Persecution			
5.1. Pest control	X	X	X
5.2. Other			
5.3. Unknown			
6. Pollution (affecting habitat and/or species)			
6.1. Atmospheric pollution			
6.1.1. Global warming/oceanic warming			
6.1.2. Acid precipitation			
6.1.3. Ozone hole effects			
6.1.4. Smog			
6.1.5. Other			
6.1.6. Unknown			
6.2. Land pollution			
6.2.1. Agricultural			
6.2.2. Domestic			
6.2.3. Commercial/Industrial			
6.2.4. Other non-agricultural			
6.2.5. Light pollution			
6.2.6. Other			
6.2.7. Unknown			
6.3. Water pollution			
6.3.1. Agricultural			
6.3.2. Domestic			
6.3.3. Commercial/Industrial			
6.3.4. Other non-agricultural			
6.3.5. Thermal pollution			
6.3.6. Oil slicks			
6.3.7. Sediment			
6.3.8. Sewage			
6.3.9. Solid waste			
6.3.10. Noise pollution			
6.3.11. Other			
6.3.12. Unknown			
6.4. Other			
6.5. Unknown			
7. Natural disasters			
7.1. Drought			
7.2. Storms/flooding			
7.3. Temperature extremes			
7.4. Wildfire			

7.5. Volcanoes			
7.6. Avalanches/landslides			
7.7. Other			
7.8. Unknown			
8. Changes in native species dynamics			
8.1. Competitors			
8.2. Predators			
8.3. Prey/food base	X	X	X
8.4. Hybridizers			
8.5. Pathogens/parasites			
8.6. Mutualisms			
8.7. Other			
8.8. Unknown			
9. Intrinsic Factors			
9.1. Limited dispersal			
9.2. Poor recruitment/reproduction/regeneration			
9.3. High juvenile mortality			
9.4. Inbreeding			
9.5. Low densities	X	X	X
9.6. Skewed sex ratios			
9.7. Slow growth rates			
9.8. Population fluctuations			
9.9. Restricted range			
9.10. Other			
9.11. Unknown			
10. Human disturbance			
10.1. Recreation/tourism			
10.2. Research			
10.3. War/civil unrest	X	X	X
10.4. Transport	X	X	X
10.5. Fire	X	X	X
10.6. Other (collection of edible biomass)	X	X	X
10.7. Unknown			
11. Other			
12. Unknown			

If you have selected "Other" for any of the threats options, please note details here:

C. Conservation Actions Authority File (Version 1.0)

In using this hierarchical classification of conservation actions, assessors are asked to indicate the conservation actions or measures that are in place and/or that are needed for each taxon. In suggesting what actions are needed, **assessors are asked to be realistic and not simply select everything. The selection should be for those actions which are most needed and which could realistically be achieved in approximately the next five years.** Selection of a higher level action e.g., 1.2. Legislation, does not mean that all the actions below this e.g., 1.2.1 Development and 1.2.2. Implementation, are indicated. It simply indicates that legislation is either in place or is needed as part of a policy-based action for the taxon concerned. Selection of any action lower down the hierarchy automatically implies that the higher levels are indicated, i.e. it is not necessary to indicate all the levels, just the lowest. For example, selecting action 4.4.2. Establishment, indicates that establishment of a protected area (action 4.4) is one of the habitat and site based actions (action 4.) required for the taxon concerned. Multiple conservation actions can be selected as required. If 'Other' is selected, the conservation action or measure must be specified. Multiple additions under 'Other' are allowed, although extensive use of this is not encouraged. If no conservation actions or measures are in place, this should be recorded, against conservation action 0. Similarly, if no conservation actions are needed, then it is also important to record this against conservation action 0 (both 'In Place' and the 'Needed' columns could be ticked). To indicate the actions use: **Yes** or **Y** or **X**.

Conservation Action	In Place	Needed
0. No conservation actions		
1. Policy-based actions		
1.1. Management plans		
1.1.1. Development	X	X
1.1.2. Implementation		X
1.2. Legislation		
1.2.1. Development		
1.2.1.1. International level	X	
1.2.1.2. National level	X	
1.2.1.3. Sub-national level		
1.2.2. Implementation		
1.2.2.1. International level	X	
1.2.2.2. National level		X
1.2.2.3. Sub-national level		X
1.3. Community management		
1.3.1. Governance		
1.3.2. Resource stewardship		X
1.3.3. Livelihood alternatives	X	X
1.4. Other		
2. Communication and Education		
2.1. Formal education	X	X
2.2. Awareness	X	X
2.3. Capacity-building/Training	X	X
2.4. Other		

3. Research actions		
3.1. Taxonomy	X	
3.2. Population numbers and range	X	X
3.3. Biology and Ecology	X	X
3.4. Habitat status	X	X
3.5. Threats	X	
3.6. Uses and harvest levels	X	X
3.7. Cultural relevance		
3.8. Conservation measures	X	X
3.9. Trends/Monitoring		X
3.10. Other		
4. Habitat and site-based actions		
4.1. Maintenance/Conservation		
4.2. Restoration		
4.3. Corridors		X
4.4. Protected areas		
4.4.1. Identification of new protected areas	X	X
4.4.2. Establishment	X	X
4.4.3. Management		X
4.4.4. Expansion		X
4.5. Community-based initiatives		X
4.6. Other		
5. Species-based actions		
5.1. Re-introductions	X	
5.2. Benign introductions		
5.3. Sustainable use		
5.3.1. Harvest management		
5.3.2. Trade management		
5.4. Recovery management		
5.5. Disease, pathogen, parasite management		
5.6. Limiting population growth		
5.7. Ex situ conservation actions		
5.7.1. Captive breeding/Artificial propagation		
5.7.2. Genome resource bank		
5.8. Other		
6. Other		

If you have ticked "Other" for any of the conservation actions options, please note details here:

D. Utilization Authority File (Version 1.0)

This Authority File should be filled for any taxon that is utilized locally, nationally or internationally. The purpose or type of use, the parts and proportion of the taxon used and the source of specimens in commercial trade should be indicated on the tables below by means of a cross (X) in the appropriate boxes. Text boxes are included for additional information. If a taxon is not utilized this should be recorded below and the remainder of the form left blank.

Taxon is not used locally, nationally or internationally

What proportion (as a %) of the total population (i.e., global) is utilized?

This helps to place the information filled in below into context

 %

Purpose/Type of Use

- Subsistence (Sub.)** Subsistence use/local trade (generally implies direct use by the harvester/family/local community; includes barter for other locally-produced goods, but not sale for profit)
- National (Nat.)** Sub-national/national trade (commercial trade, i.e. involving sale/barter for profit, without crossing international borders)
- International (Int.)** Regional/international trade (commercial trade crossing one or more international borders)

Purpose/Type of Use	Sub.	Nat.	Int.
1. Food - human Food and beverages for human consumption/nutrition			
2. Food - animal Food and liquids for consumption by domestic/captive animals			
3. Medicine - human and veterinary Materials administered specifically to treat or prevent a specific illness or injury. Items administered as vitamins, tonics etc., should be included under food.			
4. Poisons e.g. pesticides, herbicides, fish poisons			
5. Manufacturing chemicals e.g. solvents, dyes, adhesives, resins, etc. whether for domestic or commercial/industrial use			
6. Other chemicals e.g. incense, perfumes, cosmetics			
7. Fuel Including wood and charcoal production from wood, grasses, etc.			
8. Fibre e.g. for weaving, sewing, rope, paper, thatch, etc.			

9. Construction/structural materials e.g. supports, timber, fencing, etc.			
10. Wearing apparel, accessories e.g. clothing, footwear, belts, bags, trimmings			
11. Other household goods e.g. containers, furnishings, etc. with primarily utilitarian functions, though potentially highly decorated			
12. Handicrafts, jewellery, decorations, curios, etc. Finished goods with primarily ornamental/decorative rather than utilitarian functions (skins)		X	
13. Pets/display animals, horticulture Includes animals used as pets and for display (e.g. in zoos, circuses); plants used for re-planting for ornamental purposes, including in private gardens and public display (e.g. in botanical gardens)			
14. Research Includes specimens used in or as the subject of any type of research (e.g. behavioural, medicine, propagation, disease resistance, etc.)			
15. Sport hunting/specimen collecting Includes collection and preservation of dead specimens for personal pleasure, e.g. not for research; collection of live specimens should be included under pets/display animals, horticulture			
16. Other Please specify in the "Notes" section below			
17. Unknown			

If you have filled in the "other" section for purpose/type of use please put details here:

Primary forms removed from the wild

Estimated percentage of the total harvest/offtake contributed by each form (indicate with a cross (x))

Primary forms removed from the wild	100%	>75%	51-75%	26-50%	0-25%
1. Whole animal/plant Removal of the whole individual from the wild population					
2. Parts - non-lethal removal Removal of parts without obviously increasing the risk of death or decreasing reproductive ability of the individual, i.e. so that it remains a functional part of the wild population; includes non-reproductive parts shed without interference, e.g. antlers.					
3. Parts - lethal removal Removal of parts resulting in the death and or/reproductive incapacity of the individual and therefore its biological removal from the wild population. (removal of skin, other parts are discarded)	X				
4. Eggs, fruits, seeds Removal of eggs from gravid females should be included under 'parts' above.					
5. Other Please specify in the "Notes" section below.					
6. Unknown					

If you have filled in the "other" section for primary forms removed from the wild please put details here:

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Source of specimens in commercial trade

The percentage of the harvest/offtake for commercial trade (i.e. not for subsistence use) that is taken (sourced) from a particular production system (indicate with a cross (X)).

Source of specimens in commercial trade	100%	>75%	51-75%	26-50%	0-25%
1. Wild Specimens taken from natural habitat, with no human intervention in terms of enhancing individual survival or production	X				
2. Captive breeding/farming Production of offspring in a controlled environment (<i>ex situ</i>) either from parents produced in captivity (F1) or from parents taken from the wild but maintained in captivity, where there is little further input from the wild, e.g. essentially a closed cycle production system					
3. Ranching - <i>ex situ</i> Production of saleable specimens from eggs (including within gravid females), juveniles, immature plant specimens removed from the wild and raised <i>ex site</i> prior to commercial sale					
4. Ranching - <i>in situ</i> Specimens maintained within confined areas of wild habitat, with or without other forms of manipulation, e.g. habitat manipulation					
5. Other					

Please specify in the Notes section below					
6. Unknown					

If you have ticked the "other" section for source of specimens please put details here:

Offtake/harvest trends

1. Trend in the level of wild offtake/harvest in relation to total wild population numbers over the last five years (indicate with a cross (x))?

Increasing Stable Decreasing Unknown

2. Trend in the amount of offtake/harvest produced through domestication/cultivation over the last five years (indicate with a cross (x))?

Increasing Stable Decreasing Unknown

CITES status

Is the taxon included on one of the CITES Appendices (indicate with a cross (x) if known):

Appendix I Appendix II Appendix III Not Listed

If the listing is annotated for particular products, for particular populations, or there are CITES quotas in place, or recent changes in the listing, etc., these should be recorded here: