

A P P E N D I X

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The Endangered Species of the Caucasus Region

The technical description of the spatial, atmospheric needs for breeding animals

<http://www.waza.org/en/site/conservation/conservation-breeding-programmes>

<https://www.caucasus-naturefund.org/ecoregion/flora-fauna-threats/>

<https://www.iucn.org/content/new-plan-nature-conservation-caucasus>

http://awsassets.panda.org/downloads/ecp_2012.pdf

“Strengthening the protected areas network is not enough on its own: special programmes to ensure the survival and recovery of threatened species are of crucial importance”.

The established conservation breeding center is an extrinsic (re)action that bypassing various political, economic, industrial factors focuses directly on the problem and starts solving it immediately.

Box 1 - Priority species ⁴	
Mammals	
Caucasian leopard (<i>Panthera pardus saxicolor</i>)	Imperial eagle (<i>Aquila heliaca</i>)
Striped hyena (<i>Hyaena hyaena</i>)	Cinereous vulture (<i>Aegypius monachus</i>)
Brown bear (<i>Ursus arctos</i>)	Marbled duck (<i>Marmaronetta angustirostris</i>)
Lynx (<i>Lynx lynx</i>)	White-headed duck (<i>Oxyura leucocephala</i>)
West Caucasian tur (<i>Capra caucasica</i>)	Amphibians
East Caucasian tur (<i>Capra cylindricornis</i>)	Caucasian salamander (<i>Mertensiella caucasica</i>)
Caucasian red deer (<i>Cervus elaphus maral</i>)	Fish
Bezoar goat (<i>Capra aegagrus</i>)	Russian sturgeon (<i>Acipenser gueldenstaedtii</i>)
Gmelin's mouflon (<i>Ovis ammon gmelini</i>)	Persian sturgeon (<i>Acipenser persicus</i>)
Caucasian chamois (<i>Rupicapra rupicapra caucasica</i>)	Bastard sturgeon (<i>Acipenser nudiventris</i>)
Goitred gazelle (<i>Gazella subgutturosa</i>)	Sterlet (<i>Acipenser ruthenus</i>)
European bison (<i>Bison bonasus</i>)	Star sturgeon (<i>Acipenser stellatus</i>)
Birds	Atlantic (Baltic) sturgeon (<i>Acipenser sturio</i>)
Caucasian black grouse (<i>Tetrao mlokosiewiczi</i>)	Beluga (<i>Huso huso</i>)

Caucasian leopard lives in distant mountainous regions, from dry and arid areas to dense, deciduous forest, and snowy mountain ranges up to altitudes of 3,200 meters.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Pumas, jaguar, leopard, snow leopard	2	50	150	25	75	15	12

- Climbing possibilities, according to the species: branches or climbing rocks. The size of the branches should correspond to the grasping organs of the animals.
- Keeping either individually or in pairs, according to the species; enclosures that can be subdivided. Additional enclosures are necessary for additional animals.
- Screens, possibilities to withdraw and hide
- Dividing and separating possibilities.
- According to the species, elevated lying places (e.g. tamandua, giant squirrels, cats) or lookouts (otters, mongooses, etc.).
- Individual boxes for each animal; ground surface: small predators: 0.5 - 1 m²; glutton, lynxes, serval, medium-sized cats, cougars, clouded leopard: 1.5 m²; large cats, cheetah: 2.5 m²; sun bear, hyenas, aardwolf: 4 m²; large bears, giant panda: 6 m².

- Indoor enclosure only for (sub-) species that are sensitive to cold; otherwise, isolated sleeping boxes for every grown animal or indoor enclosure as indicated.

Striped hyena typically inhabits deserts, semi deserts, scrub forests, woodlands, grasslands, acacia bushlands, rocky terrain and tropical savannas. Family groups live in dens which are usually caves with narrow entrances and are concealed with large boulders. Dens can extend over a distance of 4 – 5 meters.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Hyenas	2	200	-	-	-	20	-

- Digging possibilities.
- Dividing and separating possibilities.
- Individual boxes for each animal; ground surface: small predators: 0.5 - 1 m²; glutton, lynxes, serval, medium-sized cats, cougars, clouded leopard: 1.5 m²; large cats, cheetah: 2.5 m²; sun bear, hyenas, aardwolf: 4 m²; large bears, giant panda: 6 m².

Brown bear generally seems to prefer semi-open country, with a scattering of vegetation that can allow them a resting spot during the day. They inhabit mostly mountainous woodlands, in ranges such as the Alps, the Pyrenees and the Caucasus, though they may have been driven into more wooded, precipitous habitats.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Other bears, giant panda	2	150	-	-	-	20	-

- Digging possibilities.
- Climbing possibilities, according to the species: branches or climbing rocks. The size of the branches should correspond to the grasping organs of the animals.
- Dividing and separating possibilities.
- Occupation of the animals by objects, according to species, e.g. swinging ropes, straw, plastic containers, etc.
- Bathing possibility. If pools with stipulated minimum measurements are required, re. table 23.
- Individual boxes for each animal; ground surface: small predators: 0.5 - 1 m²; glutton, lynxes, serval, medium-sized cats, cougars, clouded leopard: 1.5 m²; large cats, cheetah: 2.5 m²; sun bear, hyenas, aardwolf: 4 m²; large bears, giant panda: 6 m².
- In the case of natural grounds: for ouakkas: 50 m²; for bears: 1000 m² or more.

Lynx prefer cold, wilderness areas and high altitude forests with dense coverings of grass, reeds and shrubs. Lynx cats have very large ranges, by far the largest range of any other felids. Lynx make dens in rock crevices or under ledges. In harsh, severe weather and when breeding, lynx take shelter in caves or in hollow trees or logs.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Lynxes, serval, medium-sized cats, clouded leopard	2	30	75	20	50	10	10

- Climbing possibilities, according to the species: branches or climbing rocks. The size of the branches should correspond to the grasping organs of the animals.
- Keeping either individually or in pairs, according to the species; enclosures that can be subdivided. Additional enclosures are necessary for additional animals.
- Screens, possibilities to withdraw and hide
- Dividing and separating possibilities.
- According to the species, elevated lying places (e.g. tamandua, giant squirrels, cats) or lookouts (otters, mongooses, etc.).
- Individual boxes for each animal; ground surface: small predators: 0.5 - 1 m²; glutton, lynxes, serval, medium-sized cats, cougars, clouded leopard: 1.5 m²; large cats, cheetah: 2.5 m²; sun bear, hyenas, aardwolf: 4 m²; large bears, giant panda: 6 m².
- Indoor enclosure only for (sub-) species that are sensitive to cold; otherwise, isolated sleeping boxes for every grown animal or indoor enclosure as indicated.

West Caucasian tur, East Caucasian tur lives in rugged mountain country, rocky crags, and meadows just below the snowline between 800 and 4,000 meters above sea level.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Mouflons	10	400	-	-	-	40	-

- Climbing possibilities, according to the species: branches or climbing rocks. The size of the branches should correspond to the grasping organs of the animals.
- For animals that sustain winters will, shelter sufficient (lama, alpaca: 2 m² per animal); for other, warmth-loving species: indoor enclosure or stable as indicated. For camelids, the measurements are to be multiplied by two for individual stables.

Caucasian red deer lives in broadleaf montane forests with lush herbage and subalpine meadows. In winter deer move down to foothills or towards the southern slopes, even to juniper sparse forests and arid grasslands (Meghri Ridge).

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Large deer	6	500	-	6 / animal	-	80	-

- For animals that sustain winters will, shelter sufficient (lama, alpaca: 2 m2 per animal); for other, warmth-loving species: indoor enclosure or stable as indicated. For camelids, the measurements are to be multiplied by two for individual stables.
- According to species, possibility to separate males from females or escape possibilities for females and young.
- Muddy pool. Possibility for pigs to wallow and root.
- Trees for sweeping and branches.
- Surface applies for partially solidified installations. The measurements of enclosures consisting exclusively of natural grounds are to be tripled and it must be possible to divide the enclosures.

Bezoar goat inhabits mountainous areas at heights of up to 4,000 meters above sea level, and like a mix of rocky outcrops and shrubby vegetation or coniferous forest. In the Caucasus region, which includes countries such as Armenia, they also occur in more open, arid habitats.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Chamois, goral, serow, mountain goat, takin	4	400	-	4 / animal	-	50	-

- Climbing possibilities, according to the species: branches or climbing rocks. The size of the branches should correspond to the grasping organs of the animals.
- Screens, possibilities to withdraw and hide
- For animals that sustain winters will, shelter sufficient (lama, alpaca: 2 m2 per animal); for other, warmth-loving species: indoor enclosure or stable as indicated. For camelids, the measurements are to be multiplied by two for individual stables.
- Soft ground in outdoor enclosure (lawn, bark shavings).

Gmelin's mouflon lives mostly in open rough terrain at medium or high altitudes, where they inhabit rocky hill country, lowland and highland steppes, rocky semi-deserts, grass-covered slopes, and alpine meadows. They spend the summer at the highest elevations, right below the permanent snow. In winter, they move lower and may come into the valleys.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		

Mouflons	10	400	-	-	-	40	-
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- Climbing possibilities, according to the species: branches or climbing rocks. The size of the branches should correspond to the grasping organs of the animals.
- For animals that sustain winters will, shelter sufficient (lama, alpaca: 2 m2 per animal); for other, warmth-loving species: indoor enclosure or stable as indicated. For camelids, the measurements are to be multiplied by two for individual stables.

Caucasian chamois live at moderately high altitudes and are adapted to living in precipitous, rugged, rocky terrain. They can be found at elevations up to at least 3,600 m (11,800 ft). In Europe, Chamois spend their summers above the tree line in meadows. When winter rolls around, they go to lower elevations, of around 800 m (2,600 ft), to live in forests, mainly in areas dominated by pines.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Chamois, goral, serow, mountain goat, takin	4	400	-	4 / animal	-	50	-

- Climbing possibilities, according to the species: branches or climbing rocks. The size of the branches should correspond to the grasping organs of the animals.
- Screens, possibilities to withdraw and hide
- For animals that sustain winters will, shelter sufficient (lama, alpaca: 2 m2 per animal); for other, warmth-loving species: indoor enclosure or stable as indicated. For camelids, the measurements are to be multiplied by two for individual stables.
- Soft ground in outdoor enclosure (lawn, bark shavings).

Goitred gazelle live in deserts, semideserts, hilly plains, and plateaus are the preferred habitat for these always-on-the-move animals.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Gazelles (incl. springbok, blackbuck, impalas)	10	500	-	4 / animal	-	40	-

- Screens, possibilities to withdraw and hide
- For animals that sustain winters will, shelter sufficient (lama, alpaca: 2 m2 per animal); for other, warmth-loving species: indoor enclosure or stable as indicated. For camelids, the measurements are to be multiplied by two for individual stables.
- According to species, possibility to separate males from females or escape possibilities for females and young.

European bison is commonly found in broad-leaved or mixed forests in a mosaic-type landscape. Deciduous forest types tend to be the most favorable. All European bison populations inhabit ranges that include open areas, such as mown meadows, deforested

glades covered with grass, clear cuts, and young plantations up to ten years old. Lowland forests tend to be dominated by oak and mixed oak-pine forests. In some sites, fir and beech stands with a considerable mixture of spruce dominate bison habitat.

Species	For groups of up to n animals					For every additional animal ^{b)}	
	Number (n)	Outdoor enclosure		Indoor enclosure		Outdoor m ²	Indoor m ²
		Surface ^{c)} m ²	Volume m ³	Surface ^{a)} m ²	Volume m ³		
Large antelopes, wild cattle, musk ox	5	500	-	8 per animal	-	80	-

- For animals that sustain winters well, shelter sufficient (lama, alpaca: 2 m² per animal); for other, warmth-loving species: indoor enclosure or stable as indicated. For camelids, the measurements are to be multiplied by two for individual stables.
- Tree stumps or artificial termites' nests and sand bath or muddy pool for skin care.
- Individual stable. For social species, eye contact between the individual boxes. Heating for species that are not winter hardy.
- According to species, possibility to separate males from females or escape possibilities for females and young.
- Surface applies for partially solidified installations. The measurements of enclosures consisting exclusively of natural grounds are to be tripled and it must be possible to divide the enclosures.
- Tree stumps for the occupation of musk oxes.

Caucasian black grouse is a sedentary species, breeding in the Caucasus and Pontic Mountains of northeast Turkey on open slopes with low Rhododendron or other scrubs but in proximity to deciduous broad-leaf forest.

No specific requirements.

Imperial eagle's preferred habitat is open country with small woods; unlike many other species of eagle, it does not generally live in mountains, large forests or treeless steppes; generally prefers to construct a nest in a tree which is not surrounded by other trees, so that the nest is visible from a considerable distance, and so that the occupants may observe the surroundings unobstructed. Tree branches are taken in order to build the nest, which is upholstered with grass and feathers. Very rarely it nests on cliffs or the ground.

Species	For groups of up to n birds				For every additional bird ^{d)}		Surface of indoor enclosure per animal ^{c)}
	Number (n)	Surface of outdoor enclosure ^{a)} m ²	Surface of		Surface of outdoor enclosure m ²	Surface of aviary ^{b)} m ²	
			Aviary ^{a)} m ²	Volume m ³			

Large eagles and vultures	2	-	30	120	-	10	3
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- Possibility to perch.
- An indoor enclosure must be made available to species that are sensitive to the cold.
- Diurnal and nocturnal birds of prey may only be chained in places that are not open to the public. They must be given the opportunity to fly freely on a regular basis.
- Bathing opportunity.
- Aviaries are to be constructed in a manner so that visitors do not disturb the birds.

Cinereous vulture is a bird of hilly, mountainous areas, especially favoring dry semi-open habitats such as meadows at high altitudes over much of the range. Nesting usually occurs near the tree line in the mountains.[5] They are always associated with undisturbed, remote areas with limited human disturbance. They forage for carcasses over various kinds of terrain, including steppe, grasslands, open woodlands, along riparian habitats or any kind of mountainous habitat.

Species	For groups of up to n birds				For every additional bird ^{d)}		Surface of indoor enclosure per animal ^{c)}
	Number (n)	Surface of outdoor enclosure ^{a)}	Surface of		Surface of outdoor enclosure	Surface of aviary ^{b)}	
			Aviary ^{a)}	Volume			
		m ²	m ²	m ³	m ²	m ²	m ²
Large eagles and vultures	2	-	30	120	-	10	3

- Possibility to perch.
- An indoor enclosure must be made available to species that are sensitive to the cold.
- Diurnal and nocturnal birds of prey may only be chained in places that are not open to the public. They must be given the opportunity to fly freely on a regular basis.
- Bathing opportunity.
- Aviaries are to be constructed in a manner so that visitors do not disturb the birds.

Marbled duck prefers brackish waters, the marbled teal is found on temporary wetlands with plenty of new vegetation.

No specific requirements.

White headed duck inhabits wetlands that are composed of freshwater or alkaline eutrophic lakes, with plenty of vegetation. The body form of the white-headed duck makes it more dependent on water than other duck species, as it is awkward on land.

No specific requirements.

The Caucasian salamander lives along the banks of mountain brooks and small rivers with fast currents, both in the forest belt and above timberline, up to about 2400 m above sea level.

Species	For groups of up to n animals ^{a) b)}				For every additional animal		
	Number	Land share	Pool		Height of enclosure ^{c)} m	Land share	Pool
	(n)	Surface m ²	Surface m ²	Volume m ³		Surface m ²	Surface m ²
Giant salamanders	1	-		1	-	-	0,33 m ³

- Social structures are to be respected; individual keeping is not to be excluded.
- Appropriate filtering system. Giant salamanders: half of the volume must be circulated on an hourly basis.

Russian sturgeon

Persian sturgeon

Bastard sturgeon

Sterlets

Star sturgeon

Atlantic (Baltic) sturgeon

Beluga

Information about these endangered animals:

<http://www.iucnredlist.org/>