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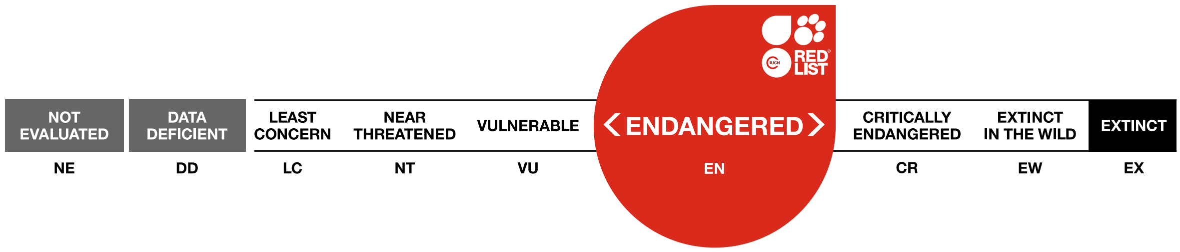
Lycaon pictus, African Wild Dog

Amendment version

Assessment by: Woodroffe, R. & Sillero-Zubiri, C.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Mammalia	Carnivora	Canidae

Scientific Name: *Lycaon pictus* (Temminck, 1820)

Synonym(s):

- *Hyaena picta* Temminck, 1820

Regional Assessments:

- Mediterranean

Infra-specific Taxa Assessed:

- Lycaon pictus North Africa subpopulation
- Lycaon pictus West Africa subpopulation

Common Name(s):

- English: African Wild Dog, Cape Hunting Dog, Painted Hunting Dog
- French: Cynhyene, Loup-peint, Lycaon
- Spanish; Castilian: Licaon
- Afrikaans: Wildehond
- German: Hyänenhund
- Italian: Licaone

Taxonomic Notes:

African Wild Dogs show morphological and genetic variation in different parts of their geographic range (Girman *et al*. 1993, Marsden *et al*. 2012). In view of this variation, in addition to the global assessment of African Wild Dogs' status, regional assessments were also conducted for West and North Africa. These regions are geographical separated by areas of unoccupied range and/or major geographical barriers, and with no expectation of recovering connectivity.

Assessment Information

Red List Category & Criteria: Endangered C2a(i) ver 3.1

Year Published: 2020

Date Assessed: May 18, 2012

Justification:

African Wild Dogs have disappeared from much of their former range. Their population is currently estimated at approximately 6,600 adults in 39 subpopulations, of which only 1,400 are mature individuals. Population size is continuing to decline as a result of ongoing habitat fragmentation, conflict with human activities, and infectious disease. Given uncertainty surrounding population estimates, and the species' tendency to population fluctuations, the largest subpopulations might well number <250 mature individuals, thereby warranting listing as Endangered under criterion C2a(i).

Previously Published Red List Assessments

2012 – Endangered (EN)
https://dx.doi.org/10.2305/IUCN.UK.2012.RLTS.T12436A16711116.en

2008 – Endangered (EN)

2004 – Endangered (EN)

1996 – Endangered (EN)

1994 – Endangered (E)

1990 – Endangered (E)

1988 – Vulnerable (V)

1986 – Vulnerable (V)

Geographic Range

Range Description:

Historical data indicate that African Wild Dogs were formerly distributed throughout sub-Saharan Africa, from desert (Lhotse 1946) to mountain summits (Thesiger 1970), and probably were absent only from lowland rainforest and the driest desert (Schaller 1972). They have disappeared from much of their former range. The species is virtually eradicated from North and West Africa, and greatly reduced in Central Africa and North-east Africa. The largest populations remain in southern Africa (especially northern Botswana, western Zimbabwe, eastern Namibia, and western Zambia) and the southern part of East Africa (especially Tanzania and northern Mozambique).

The current geographic distribution of African Wild Dogs was estimated using data compiled by the IUCN SSC range-wide conservation planning process for Cheetahs and African Wild Dogs, including regional strategies (IUCN SSC 2008, in prep.) and subsequent associated national action plans (www.cheetahandwilddog.org). Current African Wild Dog range was considered to comprise only the "resident range" identified by participants in the IUCN SSC process: this represents land where participants were confident that African Wild Dogs had been confirmed to be resident within the previous 10 years. Land where residence was not confirmed (e.g., possible range, unknown range) was excluded.

Country Occurrence:

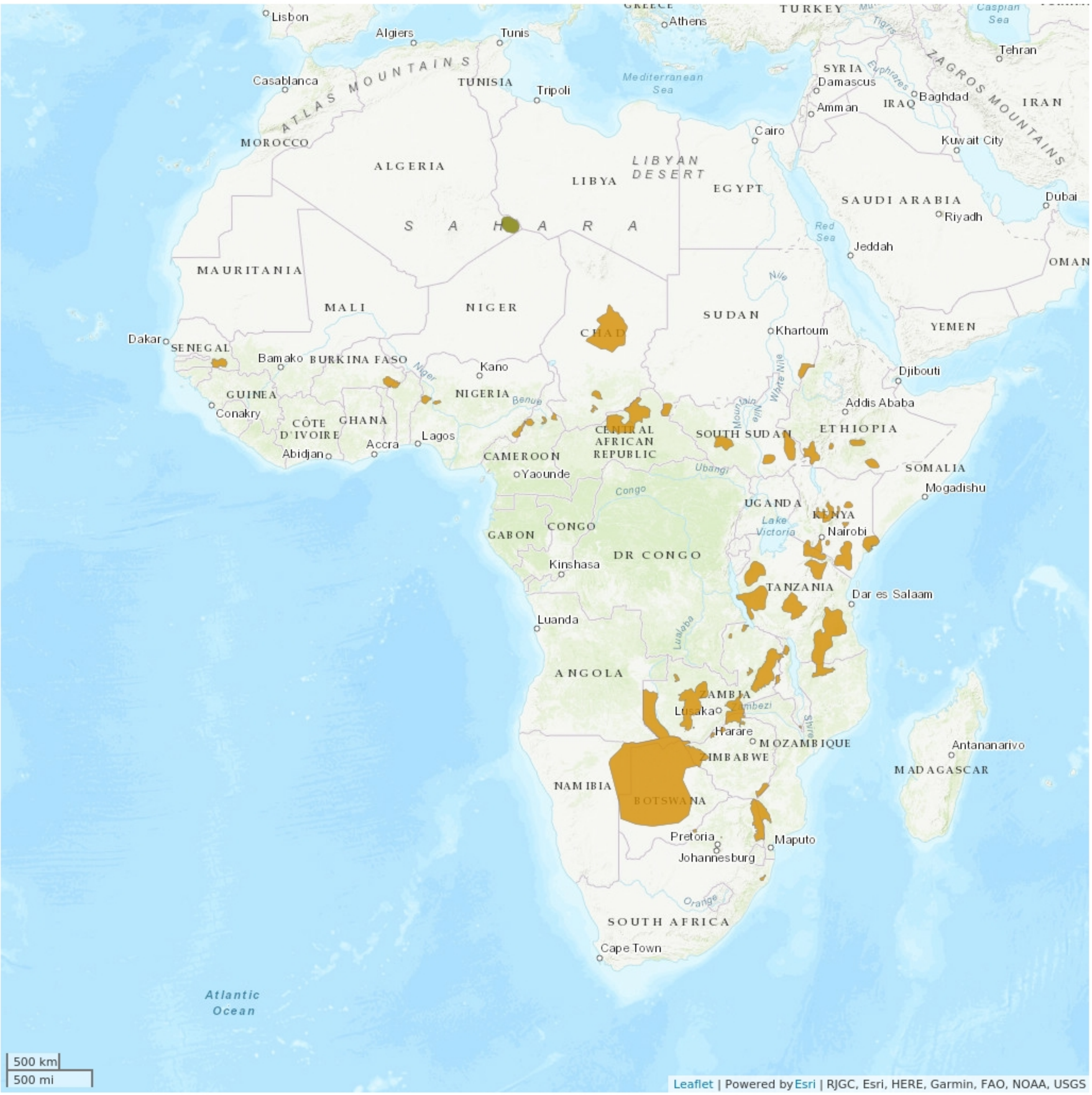
Native, Extant (resident): Angola; Benin; Botswana; Burkina Faso; Central African Republic; Chad; Ethiopia; Kenya; Malawi; Mozambique; Namibia; Niger; Senegal; South Africa; South Sudan; Sudan; Tanzania, United Republic of; Zambia; Zimbabwe

Native, Possibly Extinct: Congo, The Democratic Republic of the; Côte d'Ivoire; Guinea-Bissau; Mali; Nigeria; Togo; Uganda

Native, Extinct: Burundi; Cameroon; Egypt; Eritrea; Eswatini; Gabon; Gambia; Ghana; Mauritania; Rwanda; Sierra Leone

Native, Presence Uncertain: Algeria; Guinea

Distribution Map



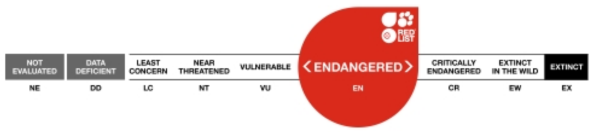
Legend

EXTANT (RESIDENT)

PROBABLY EXTANT (RESIDENT)

Compiled by:

IUCN (International Union for Conservation of Nature) 2008



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

Population

Background

African Wild Dogs are rarely seen, even where they are relatively common, and it appears that populations have always existed at very low densities. Table 2 in the supplementary material (see below) presents estimates of the sizes of African Wild Dog subpopulations occupying all discrete areas of resident range identified by participants in the range-wide conservation planning process (IUCN SSC 2008, 2009, in prep.). These comprise a total of 39 distinct subpopulations estimated to range in size from two to 276 mature individuals.

Proportion of mature individuals

Estimating the number of "mature individuals" is challenging, because African Wild Dogs are obligate cooperative breeders: within a pack, the alpha male and female are the parents of the majority of surviving pups (Girman *et al.* 1997). The IUCN Red List User Guidelines (IUCN 2010) define mature individuals as "individuals known, estimated or inferred to be capable of reproduction", but do not specify the time period within which reproduction is considered possible. The User Guidelines go on to state "in many taxa there is a pool of non-reproductive (e.g., suppressed) individuals that will quickly become reproductive if a mature individual dies. These individuals can be considered to be capable of reproduction".

In African Wild Dogs, a high proportion of individuals are indeed reproductively suppressed, but these animals do not always become reproductive "quickly" if an alpha individual dies. In a mature pack, most pack members are offspring of the alpha pair; for these animals, death of an alpha would usually not open up a breeding opportunity because no unrelated mates would be available within the pack. In our experience, death of an alpha often leads to disintegration of the pack, with no breeding until new packs are formed. Given these complexities, and in keeping with the spirit of capturing a "snapshot" of current conditions, we have chosen to define mature individuals as those considered capable of reproduction within the current breeding season. The number of mature individuals thus comprises the number of alpha males and females, and the number of sub-dominant (i.e. non-alpha) animals which breed successfully.

Table 1 in the supplementary material (see below) provides demographic data to allow the estimation of numbers of mature individuals (Nm) from the census population of adults and yearlings (Nc). Using these data, the number of alpha males (NaM) and females (NaF) would be estimated thus:

NaM = Nc x 0.55 x 0.176
NaF = Nc x 0.45 x 0.215

Reassuringly, these equations return approximately equal estimates of the numbers of alpha males and alpha females.

No published estimate is available of the proportion of adults and yearlings which breed successfully as sub-dominants. However, Girman et al. (1997) report the proportions of surviving pups with sub-dominant mothers and/or fathers. Using a simple assumption that litter size was unrelated to social status, we therefore estimate the number of sub-dominant breeders (Nsub) as:

Nsub = (NaM x 0.10) + (NaF x 0.08)

The number of mature individuals is then calculated as

Nm = NaM + NaF + Nsub

We made exploratory calculations to investigate the effect of including the probability of currently-suppressed individuals surviving and breeding in subsequent years. These calculations became highly complex, and risked double-counting animals which might breed as sub-dominants in the current year and then attain alpha (dominant) status in later years. It is also important to note that, in the previous listing, the number of mature individuals was estimated simply as the number of alpha animals (i.e., NaM + NaF). These alternative ways of calculating numbers of mature individuals contribute to considerable uncertainty about African Wild Dog numbers.

Current population size

Table 2 in the supplementary material (see below) presents estimates of the sizes of African Wild Dog subpopulations occupying all discrete areas of resident range identified by participants in the range-wide conservation planning process (IUCN SSC 2008, 2009, in prep.). These comprise a total of 39 distinct sub-populations estimated to range in size from two to 276 mature individuals. Few wild dog subpopulations have been systematically monitored, and these estimates are subject to considerable imprecision. This imprecision, combined with uncertainty about the calculation of mature individuals, and the species' propensity for substantial population fluctuations, means that these population estimates should be viewed with great caution. Lack of precision has important consequences for Red List assessment; the two largest sub-populations (estimated at 268 and 276 mature individuals) are only slightly larger than one of the threshold sub-population sizes used by the Red List criteria (250 mature individuals: EN C2(i)). Had only alpha animals been considered mature individuals (as in the previous assessment), the sizes of these two largest sub-populations fall to 246 and 253 respectively. This uncertainty needs to be taken into account in comparing estimates of African Wild Dogs' population sizes with IUCN Red List criteria.

Change in population size

Data on African Wild Dogs' past global population size are taken from Ginsberg and Woodroffe (1997). It is important to note, once again, that few of these population estimates are based on systematic monitoring, and all should be viewed with caution. Assessing changes in population size is complicated by the fact that a less complete dataset was available in 1997 than in 2012. As a result of these improved data, the global estimate of African Wild Dog population size is in fact higher for 2012 than for 1997. However, this difference reflects the greater area surveyed in 2012.

To try to overcome this problem, Table 3 in the supplementary material (see below) compares estimates of subpopulation size in 1997 (taken from Ginsberg and Woodroffe 1997) with estimates of African Wild Dog subpopulations from the same areas in 2012. Subpopulations known in 2012 but not known in 1997 are excluded. However, sub-populations known to be absent in 1997 (e.g. the managed metapopulation in South Africa, and the sub-population in Laikipia District, Kenya) are included in Table 3 . Hence, Table 3 represents our best assessment of a like-with-like comparison of African Wild Dog numbers in 1997 and 2012

Causes of decline

The causes of African Wild Dogs' decline are reasonably well understood and include extreme sensitivity to habitat fragmentation as a consequence of wide-ranging behaviour, conflict with livestock and game farmers, accidental killing by people in snares and road accidents, and infectious disease. All of these causes are associated with human encroachment on African Wild Dog habitat and, as such, have not ceased and are unlikely to be reversible across the majority of the species' historical range.

Fluctuations in population size

Populations of African Wild Dogs are prone to marked fluctuations at a variety of temporal and geographical scales which are likely to both increase extinction risks and undermine the precision of population estimates. At the local scale, a combination of high mortality, high fecundity, and dispersal by both sexes means that pack size fluctuates substantially over short periods (Figure 1 in the supplementary material), although fluctuation in numbers of mature individuals would be less dramatic. Because African Wild Dogs are seasonal breeders across most of their remaining geographic range, fluctuations may be synchronised across packs (see Figure 1 in the supplementary material).

The same demographic characteristics – high mortality, high fecundity, and long-distance dispersal – likewise lead to fluctuations at the population scale. This pattern is further exaggerated by the species' susceptibility to infectious disease which can cause rapid die-offs. Local extinctions are not uncommon, and are often both rapid and unanticipated. Figure 2 in the supplementary material presents data from three relatively well-documented cases of local extinction involving small wild dog subpopulations affected by rabies.

Similar die-offs have been documented in larger African Wild Dog populations. For example, five of 12 study packs in Botswana (Alexander *et al.* 2010) and three of eight study packs in Kenya (Woodroffe 2011) have been reported as having died within short time periods during disease outbreaks. Although these relatively large study populations recovered, the majority of African Wild Dog sub-populations are estimated to comprise ≤20 mature individuals and could be severely compromised by outbreaks of this size.

For comparison, under good conditions African Wild Dog populations are also able to grow relatively quickly. African Wild dogs' capacity for very long-range dispersal means that sub-populations sometimes reappear unexpectedly and grow rapidly; examples include natural recoveries in Samburu and Laikipia Districts, Kenya (Woodroffe 2011), Savé Valley Conservancy in Zimbabwe (Pole 2000), and the Serengeti ecosystem of Tanzania (Marsden *et al.* 2011). As an example of the speed of recovery, the subpopulation in Laikipia District, Kenya, grew from 0 in 1999 to 17 adults and yearlings in two packs by 2000, and by 2006 had increased 10-fold to 170 adults and yearlings (Woodroffe 2011).

On the basis of this evidence, we conclude that African Wild Dogs show substantial population fluctuations, but may not experience extreme fluctuations in sub-population size as outlined in the Red List guidelines. Nevertheless, the substantial fluctuations which do occur contribute to further uncertainty about sub-population sizes.

For further information about this species, see Supplementary Material.

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

African Wild Dogs are generalist predators, occupying a range of habitats including short-grass plains, semi-desert, bushy savannas and upland forest. While early studies in the Serengeti National Park, Tanzania, led to a belief that African Wild Dogs were primarily an open plains species, more recent data indicate that they reach their highest densities in thicker bush (e.g., Selous Game Reserve, Tanzania; Mana Pools National Park, Zimbabwe; and northern Botswana). Several relict populations occupy dense upland forest (e.g., Harenna Forest, Ethiopia; Malcolm and Sillero-Zubiri 2001). African Wild Dogs have been recorded in desert (Lhotse 1946) (although most desert populations are now extirpated), but not in lowland forest. It appears that their current distribution is limited primarily by human activities and the availability of prey, rather than by the loss of a specific habitat type.

African Wild Dogs mostly hunt medium-sized antelope. Whereas they weigh 20–30 kg, their prey average around 50 kg, and may be as large as 200 kg. In most areas their principal prey are Impala (*Aepyceros melampus*), Greater Kudu (*Tragelaphus strepsiceros*), Thomson's Gazelle (*Eudorcas thomsonii*) and Common Wildebeest (*Connochaetes taurinus*). They will give chase of larger species, such as Common Eland (*Tragelaphus oryx*) and African Buffalo (*Syncerus caffer*), but rarely kill such prey. Small antelope, such as Dik-dik (*Madoqua* spp.), Steenbok (*Raphicerus campestris*) and Duiker (tribe Cephalophini) are important in some areas, and warthogs (*Phacochoerus* spp.) are also taken in some populations. African Wild Dogs also take very small prey such as hares, lizards and even eggs, but these make a very small contribution to their diet.

Generation length

Data on lifetime reproductive success of 19 alpha (breeding) females in western Zimbabwe indicate that 50% of reproductive output was achieved by age 5.5 years (SD 1.35, range 3–8; G.S.A. Rasmussen, unpubl. data). An alternative method, considers the average age of mothers of known litters, without the need for data on lifetime reproductive success. This method gives good agreement with the IUCN recommendations on calculating generation length, indicating a mean female breeding age of 5.7 years from the Zimbabwe dataset. Using this method, data from 18 litters born in Kenya to known-age mothers suggest a mean generation length of 5.0 years (R. Woodroffe, unpubl. data). Both studies suggest a minimum age at first breeding of approximately three years. Based on these data, for convenience we have estimated changes in African Wild Dog populations using a generation time of five years.

Systems: Terrestrial

Use and Trade (see Appendix for additional information)

Across most of its geographical range, there is minimal utilization of this species. There is evidence of localized traditional use in Zimbabwe (Davies and Du Toit 2004), but this is unlikely to threaten the species' persistence. There are also some reports of trade in captive and wild-caught animals from southern Africa; the possible impact of such trade is currently being assessed.

Threats (see Appendix for additional information)

The principal threat to African Wild Dogs is habitat fragmentation, which increases their contact with people and domestic animals, resulting in human-wildlife conflict and transmission of infectious disease. The important role played by human-induced mortality has two long-term implications. First, it makes it likely that, outside protected areas, African Wild Dogs may be unable to coexist with increasing human populations unless land use plans and other conservation actions are implemented. Second, African Wild Dog ranging behaviour leads to a very substantial "edge effect", even in large reserves. Simple geometry dictates that a reserve of 5,000 km² contains no point more than 40 km from its borders – a distance well within the range of distances travelled by a pack of African Wild Dogs in their usual ranging behaviour. Thus, from an African Wild Dog's perspective, a reserve of this size (fairly large by most standards) would be all edge. As human populations rise around reserve borders, the risks to African Wild Dogs venturing outside are also likely to increase. Under these conditions, only the very largest unfenced reserves will be able to provide any level of protection for African Wild Dogs. In South Africa, "predator proof" fencing around small reserves has proved reasonably effective at keeping dogs confined to the reserve, but such fencing is not 100% effective (Davies-Mostert *et al*. 2009) and is unlikely to be long-term beneficial for wildlife communities.

Even in large, well-protected reserves, or in stable populations remaining largely independent of protected areas (as in northern Botswana), African Wild Dogs live at low population densities. Predation by Lions, and perhaps competition with Spotted Hyaenas, contribute to keeping African Wild Dog numbers below the level that their prey base could support. Such low population density brings its own problems. The largest areas contain only relatively small wild dog populations; for example, the Selous Game Reserve, with an area of 43,000 km² (about the size of Switzerland), is estimated to contain about 800 African Wild Dogs. Most reserves, and probably most African Wild Dog populations, are smaller. For example, the population in Niokolo-Koba National Park and buffer zones (about 25,000 km²) is likely to be not more than 50–100 dogs. Such small populations are vulnerable to extinction. "Catastrophic" events such as outbreaks of epidemic disease may drive them to extinction when larger populations have a greater probability of recovery – such an event seems to have led to the local extinction of the small African Wild Dog population in the Serengeti ecosystem on the Kenya-Tanzania border. Problems of small population size will be exacerbated if, as seems likely, small populations occur in small reserves or habitat patches. As discussed above, animals inhabiting such areas suffer a strong "edge effect". Thus, small populations might be expected to suffer disproportionately high mortality as a result of their contact with humans and human activity.

Conservation Actions (see Appendix for additional information)

Conservation strategies have been developed for the species in all regions of Africa Sillero-Zubiri *et al*. 2004, Woodroffe *et al*. 1997, (IUCN SSC 2008, 2009, in prep.), and many range states have used these strategies as templates for their own national action plans (Department of Wildlife and National Parks 2008, Wildlife Service 2010). Although each regional strategy was developed independently through a separate participatory process, the three strategies have a similar structure, comprising objectives aimed at improving coexistence between people and African Wild Dogs, encouraging land use planning to maintain and expand wild dog populations, building capacity for wild dog conservation within range states, outreach to improve public perceptions of wild dogs at all levels of society, ensuring a policy framework compatible with wild dog conservation. These strategies are accessible at www.cheetahandwilddog.org.

Gaps in knowledge

Several pieces of information are needed to enable more effective conservation of African wild dogs. These include: 1) development of cost-effective methods for surveying wild dogs across large geographical scales; 2) surveys of wild dog distribution and status, particularly in Algeria, Angola, Central

African Republic, Chad, Somalia, South Sudan, and Sudan; 3) development of locally-appropriate and effective means to reduce conflict between wild dogs and farmers; 4) establishing which techniques will be most effective and sustainable for protecting wild dogs from disease; and 5) determining the landscape features which facilitate (or prevent), wild dog movement over long distances and hence promote (or block) landscape connectivity.

Credits

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Authority/Authorities:	IUCN SSC Canid Specialist Group (foxes, jackals and wild dogs)

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External Resources

For Supplementary Material, and for Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.5. Forest - Subtropical/Tropical Dry	-	Suitable	Yes
1. Forest -> 1.7. Forest - Subtropical/Tropical Mangrove Vegetation Above High Tide Level	-	Marginal	-
1. Forest -> 1.9. Forest - Subtropical/Tropical Moist Montane	-	Marginal	-
2. Savanna -> 2.1. Savanna - Dry	-	Suitable	Yes
2. Savanna -> 2.2. Savanna - Moist	-	Suitable	Yes
3. Shrubland -> 3.5. Shrubland - Subtropical/Tropical Dry	-	Suitable	Yes
4. Grassland -> 4.5. Grassland - Subtropical/Tropical Dry	-	Suitable	Yes
8. Desert -> 8.1. Desert - Hot	-	Marginal	-

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Future	Minority (50%)	Slow, significant declines	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 2. Species Stresses -> 2.2. Species disturbance		
1. Residential & commercial development -> 1.2. Commercial & industrial areas	Future	Minority (50%)	Slow, significant declines	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.3. Agro-industry farming	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 2. Species Stresses -> 2.2. Species disturbance		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.1. Nomadic grazing	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		

2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.2. Small-holder grazing, ranching or farming	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
2. Agriculture & aquaculture -> 2.3. Livestock farming & ranching -> 2.3.3. Agro-industry grazing, ranching or farming	Ongoing	Minority (50%)	Causing/could cause fluctuations	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
3. Energy production & mining -> 3.1. Oil & gas drilling	Future	Minority (50%)	Causing/could cause fluctuations	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects		
3. Energy production & mining -> 3.2. Mining & quarrying	Future	Minority (50%)	Causing/could cause fluctuations	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.3. Indirect species effects		
4. Transportation & service corridors -> 4.1. Roads & railroads	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.1. Intentional use (species is the target)	Ongoing	Minority (50%)	Negligible declines	Low impact: 4
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.2. Unintentional effects (species is not the target)	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.1. Hunting & trapping terrestrial animals -> 5.1.3. Persecution/control	Ongoing	Minority (50%)	Slow, significant declines	Low impact: 5
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
5. Biological resource use -> 5.3. Logging & wood harvesting -> 5.3.3. Unintentional effects: (subsistence/small scale) [harvest]	Future	Minority (50%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
6. Human intrusions & disturbance -> 6.2. War, civil unrest & military exercises	Ongoing	Unknown	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.1. Unspecified species	Ongoing	Majority (50-90%)	Causing/could cause fluctuations	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		

8. Invasive and other problematic species, genes & diseases -> 8.5. Viral/prion-induced diseases -> 8.5.1. Unspecified species	Ongoing	Majority (50-90%)	Causing/could cause fluctuations	Medium impact: 6
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
11. Climate change & severe weather -> 11.3. Temperature extremes	Future	Majority (50-90%)	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects		

Conservation Actions in Place
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Action in Place
In-place research and monitoring
Action Recovery Plan: Yes
Systematic monitoring scheme: Yes
In-place land/water protection
Conservation sites identified: Yes, over entire range
Area based regional management plan: No
Occurs in at least one protected area: Yes
In-place species management
Successfully reintroduced or introduced benignly: Yes
Subject to ex-situ conservation: Yes
In-place education
Subject to recent education and awareness programmes: Yes
Included in international legislation: Yes
Subject to any international management / trade controls: No

Conservation Actions Needed
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Action Needed
1. Land/water protection -> 1.1. Site/area protection
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
2. Land/water management -> 2.3. Habitat & natural process restoration
3. Species management -> 3.2. Species recovery

Conservation Action Needed
3. Species management -> 3.3. Species re-introduction -> 3.3.1. Reintroduction
4. Education & awareness -> 4.1. Formal education
4. Education & awareness -> 4.2. Training
4. Education & awareness -> 4.3. Awareness & communications
5. Law & policy -> 5.1. Legislation -> 5.1.1. International level
5. Law & policy -> 5.1. Legislation -> 5.1.2. National level
5. Law & policy -> 5.2. Policies and regulations
5. Law & policy -> 5.3. Private sector standards & codes
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.1. International level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.2. National level
5. Law & policy -> 5.4. Compliance and enforcement -> 5.4.3. Sub-national level
6. Livelihood, economic & other incentives -> 6.1. Linked enterprises & livelihood alternatives
6. Livelihood, economic & other incentives -> 6.4. Conservation payments
6. Livelihood, economic & other incentives -> 6.5. Non-monetary values

Research Needed
(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.4. Harvest, use & livelihoods
1. Research -> 1.5. Threats
1. Research -> 1.6. Actions
2. Conservation Planning -> 2.2. Area-based Management Plan
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km^2): 1303469
Estimated extent of occurrence (EOO) (km^2): 7529483
Lower elevation limit (m): 0

Distribution
Upper elevation limit (m): 4,000
Population
Number of mature individuals: 1,409
Continuing decline of mature individuals: Yes
Extreme fluctuations: No
Population severely fragmented: No
All individuals in one subpopulation: No
No. of individuals in largest subpopulation: 250
Habitats and Ecology
Generation Length (years): 5

Amendment

Amendment reason: The threats to this species have been corrected to reflect the unintentional effects of logging and wood harvesting to the species.

The IUCN Red List Partnership

The IUCN Red List of Threatened Species™ is produced and managed by the IUCN Global Species Programme, the IUCN Species Survival Commission (SSC) and The IUCN Red List Partnership.

The IUCN Red List Partners are: Arizona State University; BirdLife International; Botanic Gardens Conservation International; Conservation International; NatureServe; Royal Botanic Gardens, Kew; Sapienza University of Rome; Texas A&M University; and Zoological Society of London.