



## "The Disappearing Voices": Social and Ecological Insights into the Dhole (*Cuon alpinus*)

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### Abstract

The Dhole (*Cuon alpinus* Pallas, 1811) or Indian Wild Dog is a highly social canid native to Central, South and Southeast Asia. Though genetically related to *Canis* species, its unique morphology and cooperative behaviour justify its classification in the monotypic genus *Cuon*. Once widely distributed, its range has greatly declined due to habitat loss, persecution, disease and competition with other predators. Classified as *Endangered* by the IUCN, fewer than 2,500 individuals remain globally, with India supporting the largest surviving populations, particularly in the Western Ghats. Dholes live in diverse habitats ranging from tropical forests to alpine regions and form cohesive packs of 8–25 individuals with home ranges of 20–84 km<sup>2</sup>. They are cooperative hunters, mainly preying on medium-sized ungulates like sambar (*Rusa unicorn*), chital (*Axis axis*) and wild pig (*Sus scrofa*). Although they share habitats with tigers and leopards, they minimize conflict through prey and temporal niche separation. As key predators, Dholes help regulate prey populations and maintain ecosystem balance. However, continued habitat fragmentation and disease transmission from domestic dogs threaten their survival, emphasizing the urgent need for focused conservation efforts.

**Keywords:** Apex, Conservation, Dhole, Habitat, Predator, Western Ghats

### Introduction

Central, South and Southeast Asia are home to the Dhole or Indian Wild dog (*Cuon alpinus* Pallas 1811). The species is included in the monotypic genus "Cuon Hodgson" despite being phylogenetically closer to the members of the genus *Canis*. This is because the species' physical and behavioural peculiarities are great enough to warrant consideration of a new genus. Dholes are consistently distinguished from other canids by their social behaviour and morphology (Hodgson 1838; Pocock 1936). In contrast to gray wolves (*Canis lupus*) and other canids, they are extremely gregarious creatures without strict hierarchies of authority. When hunting, dhole groups show a high level of cooperation and employ unique tactics to find prey. They hunt primarily in the mornings and evenings and have a diurnal habit (Johnsingh, 1982; Acharya, 2007).

Dholes live among other apex carnivores, including tigers and leopards, in a significant portion of its territory. regardless of their

competition for prey, these sympatric carnivores avoid interacting through ecological divisions and variable niche occupancy, such as differential prey selection, in which numerous carnivores favor prey animals of different species, ages, sexes and sizes (Johnsingh, 1992; Karanth and Sunquist, 1995; Karanth and Sunquist, 2000). Despite its extensive range, the IUCN has classified the species as "Endangered" since its current estimated population status is less than 2500 (Kamler et al., 2015).

The largest number of Dholes worldwide is found in India. Dholes can be found in practically every protected region in Northeast India, Central India, the Western Ghats and the Eastern Ghats, although 60% of them have vanished from their historical ranges (Johnsingh 1985). Wild dog populations are healthy in the Western Ghats, a global hotspot for biodiversity.

### Habitat Range and Survival Status of the Dhole Species

Pack-hunting canids identified as dholes (*Cuon*

alpinus) were previously found across the Altai and Tyan-Shan mountains as well as the Soviet Union's Maritime Province, which spread southward through Mongolia, Korea, China, Tibet, Nepal, India and South-east Asia, which comprised the Malayan Peninsula, Sumatra and Java (Cohen 1978).

The status and distribution of Dholes in South Asia were studied by Johnsingh (1985). Three of the nine subspecies were frequently documented, while five were found in South Asia. Dholes were found in nearly all protected areas across North-East India, Central India, the Western Ghats and the Eastern Ghats, despite having vanished from their old habitats.

Despite their ability to adapt to a wide range of vegetation types, including tropical dry and moist deciduous forests, evergreen and semi-evergreen forests, temperate deciduous forests, boreal forests, dry thorn forests, grassland-scrub-forest mosaics, temperate steppe and alpine steppe, Dholes are listed as endangered by the Institute for the Conservation of Nature and Natural Resources. Due to habitat loss, livestock predation, disease transmission from domestic dogs, persecution and potential interspecific competition, their range has been reduced to certain areas of Bangladesh, Bhutan, Cambodia, China, India, Indonesia and the Lao People's Democratic Republic (Kamler et al., 2015).

### Lineage and Taxonomic Identity

With *Canis primaevus* as the original specimen, Hodgson (1838) defined the genus *Cuon* in the family Canidae under the order Carnivora. Pocock (1936) authored the genus *Cuon* and investigated the anatomy of the skin and skull. *Cuon javanicus* is the name given by the author to the Asiatic Wild Dog, also known as the Dhole. *Cuon alpinus*, the Dhole, Asiatic Wild Dog or Red Dog, is the sole species of the genus *Cuon* that is still alive, according to Cohen (1976), who synonymized the nine ancient species. Eleven subspecies of wild dogs were identified by Ginsberg (1990), three of which were found in India: *C. a. dukhunensis*, which is found south of the Ganga River; *C. a. primaevus*, which is found in Kumaon, Nepal, Sikkim and Bhutan; and *C. a. laniger*, which is found in Kashmir and Ladakh. The subspecies *C. a. adustus*, which is found in northern Myanmar, may also be found in nearby regions of India, according to certain opinions. The other subspecies discovered in Myanmar that could exist inside Indian borders was determined to be *C. a. infuscus*. According to Iyengar et al. (2005), the subspecific status of the Sumatran and Javanese Dholes was

uncertain and required further research. They also identified two major phylogeographic genetic groupings within the southern Dhole group on the mainland.

### Life and Social Behaviour in the Wild

The size of Dhole packs varied throughout studies. Davidar (1975) estimated the largest pack to have forty individuals, while Venkataraman et al. (1995) reported the largest pack to have twenty-five individuals. Fox (1984) explained that these huge packs may be the result of brief pack fusion or philopatry with neighbouring packs that have recently shared hunter bloodlines.

The social behavior and reproductive biology of Dholes in Bandipur were investigated by Johnsingh (1982). Eight and three adults made up the average pack size in the research area. Near water sources, Dhole dens were nearly universal. From September to February, Dholes' oestrous phase lasted. The gestational duration was estimated to be between 60 and 62 days. The dhole pack was fiercely protective of its home range, which was 20 km<sup>2</sup> (Johnsingh 1982). No pack hunts in the central region of another pack's territory. Venkataraman et al. (1995) found that the individual home ranges of two Dhole packs in Mudumalai were 53 km<sup>2</sup> and 84 km<sup>2</sup>, respectively, bigger than those of Bandipur (Johnsingh, 1982). During the denning and nursing season, Dhole packs confined themselves to a short region (15–20 km<sup>2</sup>), as determined by radio-telemetric research by Acharya (2007). Gradually, ranges expanded (30–60 km<sup>2</sup>) during the post-denning season. The dispersal and pre-denning seasons saw an increase in home range sizes. An ideal pack of Dhole would have a tiny core region of 20 km<sup>2</sup> in the middle and an average range of 60–70 km<sup>2</sup>.

### Feeding Ecology and Interactions with Other Carnivores

The primary prey of Dholes in Mudumalai, according to Cohen et al.'s 1978 study, was the common hare (*Lepus nigricollis*), which was followed by the chital (*Axis axis*), sambar (*Rusa unicolor*), field rat (*Millardia meltada*) and wild pig (*Sus scrofa*). Mouse deer, Gaur, Muntjac and domestic cattle were reported to be very rarely preyed upon. Dholes did not favor cattle flesh, despite the study area's excessive cattle population. The prey choices of three large sympatric carnivores from the Bandipur Tiger Reserve was examined by Johnsingh (1992). Regardless of the predator's weight, all three predators favored prey in different weight categories, even though they could all kill large

prey. There were 42% of tiger kills with prey weighing more than 100 kg, 69% of leopard kills with prey weighing less than 50 kg and 1% of Dholes' kills were above 100 kg, 25% were between 50 and 100 kg and 74% were under 50 kg. In research on the selection of prey by tigers, leopards and dholes in tropical rain forests, Karanth and Sunquist (1995) discovered that tigers favoured prey weighing over 176 kg, such as gaurs and sambars, whereas leopards and dholes chose prey weighing between 30 and 175 kg. The average weight of the prey that the tiger, leopard and dhole killed was 43.4 kg, 37.6 kg and 91.5 kg, respectively.

Dholes favoured adult male Chitals and Sambars, while Tigers favoured adult males of Chitals, Sambars, Wild Pigs and young Gaurs. It was noted that leopards lacked a preference. In Nagarhole, Karanth and Sunquist (2000) studied the behavioural correlates of tiger, leopard and Dhole predation. They found that the three predators killed distinct prey kinds according to species, age, size and age-sex classes. When compared to felids, dholes' hunting behavior patterns differed somewhat. Dholes were seen to be nearly daily. All three predators utilized similar habitats and the same locations. Overall, all predators' activity patterns were more closely linked to their primary prey's activity patterns than to mutual avoidance.

In 2002, Biswas and Sankar conducted research on the dietary habits of tigers in Madhya Pradesh's Pench National Park. According to the study, the majority of their food consisted of chital (47.3%), followed by wild pig (10.9%) and sambar (14.5%). Whenever possible, tigers killed both large and medium-sized prey. Chital was hunted in proportion to its abundance, but Sambar and Wild Pig were hunted more than their numbers. Consumption of common langur was lower than its availability. Nilgai and Gaur were not seen to be part of the tiger's diet. In the study area, the average weight of the prey that tigers killed was 82.1 kg. Wild ungulates were more important to tigers than agricultural livestock. The prey choices of Indian tigers in the Nagarjunasagar Srisailem Tiger Reserve were examined by Reddy et al. (2004). The most frequent prey, according to the study, was the wild pig, which was followed by sambar and chital. The proportion of livestock in the diet was less than 7%. Tigers avoided predating cattle and favoured smaller prey in tropical dry deciduous forests with high livestock biomass and low natural prey density.

According to Acharya (2007), Dhole in Pench Tiger Reserve ate at least seven different kinds

of prey. They most frequently ate Sambar (50%) at a rate that was much greater than its availability, followed by Chital (38%), which was the most common prey in the area. During the investigation, sambar was the sole favoured prey species found and approximately 6% of the scat samples had multiple prey species. Andheria et al. (2007) studied the food and prey profiles of three sympatric big carnivores in Bandipur Tiger Reserve: the tiger, leopard and Dhole. They found that, despite killing 11-15 vertebrate prey species, there was a high degree of overlap in their nutritional niches. While medium-sized prey like Chital and Wild Pig made for 65 percent and 83 percent of the biomass intake of leopards and Dholes, respectively, the largest ungulates, such as Gaur and Sambar, accounted for 73 percent of the tigers' intake.

Leopards in the Melghat Tiger Reserve consume 11 different species of prey, including small animals like Indian Hare, according to Shirbhate (2007). In accordance with biomass, leopards favored sambar, which was followed by domestic animals, chimpanzees, four-horned antelopes and wild pigs. Leopards favored Indian hares on a frequency basis, followed by sambars, wild pigs, langurs and domestic animals. There were two prey species in 49.62% of the scats. During the study period, the average daily biomass consumed by a leopard was 1.3037 kg. Twelve prey species were discovered in the diet of 98 scats of tigers at Melghat Tiger Reserve. Based on the biomass in their diet, the scat analysis showed that tigers favored Sambar, followed in order of choice by wild pig, domestic animals, chital and four-horned antelope. Tigers favored Sambar above Indian Hare, Wild Pig, Four Horned Antelope and Chital, depending on the occurrence of prey. The study concluded that tigers favored smaller prey, such as Indian Hare and did not hunt gaurs, which were heavier than the predators. During the study period, a tiger's daily average biomass consumption was 2.2856 kg. Borah et al. (2009) used scat analysis to identify seven prey species while studying the dietary habits of Dholes in Satpura Tiger Reserve. Muntjac and Jungle Fowl had the lowest percentage of prey frequency, while Sambar had the greatest at 46.97%. Sambar contributed the most biomass (68.03%), while Jungle Fowl contributed the least (0.28%).

To conserve the endangered Asiatic Wild Dog, Gopi et al. (2010) conducted a study in Western Arunachal Pradesh. They found that the animals consumed the most biomass from wild pigs (36%) followed by sambar (34%), barking deer

(14.7%) and gaur (10.8%). To the extent that the prey species were available, they were taken.

According to a study by Kamler et al. (2012) on the diet, prey selection and activity of Dholes in Northern Laos, ungulates accounted for 87% of the prey's biomass, with other carnivores (6%) and rodents (6%), coming in second and third, respectively. Nearly diurnal dholes were observed. They had distinct activity patterns from other ungulates, although they still had a preference for Muntjac and Sambar. In Kalakad-Mundanthurai Tiger Reserve, Selvan et al. (2013a) observed that Dhole ingested ten different kinds of prey, with Sambar being the most consumed in terms of percentage and quantity, followed by wild pigs. The least amount of Jungle Fowl was consumed.

Three sympatric big carnivores of the Eastern Himalayan Biodiversity Hotspot were studied by Selvan et al. (2013b) in a tropical lowland forest for their dietary habits and prey selection. Tiger-leopard (85.3%) and tiger-Dhole (77.5%) prey consumption overlapped significantly, according to the study and the biomass consumption of the three sympatric predators ranged from 254.3 kg for Dholes to 599.1 kg for tigers. Despite their scarcity, Dholes favored Wild Pig and Barking Deer.

Based on a study by Bashir et al. (2013) on the condition of Dhole in high elevation habitats in Khangchendzonga Biosphere Reserve, Sikkim, the diet of Dhole consisted of some vegetative matter, Himalayan Tahr, Goral, Serow and unknown rodents. Mountain ungulates, such as Goral, Himalayan Tahr and Serow, made up 98.7% of the biomass. Rodents appeared more frequently in Dholes' diet. The heaviest prey consumed was Serow (91–100 kg), which was followed by Himalayan Tahr (80 kg) and Goral (30 kg).

In Shey Phoksundo National Park, Nepal, Devkota et al. (2013) studied the diet of Snow Leopards (*Panthera uncia*) and identified 11 items of prey from the study area. Out of the wild prey, Blue Sheep (30%) dominated the diet of Snow Leopards, followed by rodents and Himalayan Marmots based on the frequency of prey occurrence. Seventy percent of the Snow Leopards' diet consisted of wild prey, while 30% consisted of livestock. Plant materials were also discovered in the scats. Sambar, Chital and wild pig made up two-thirds of the Dhole's (*Cuon alpinus*) food biomass, according to Hayward et al. (2014). Of these, Sambar was preferred more and the preferred weight range (130–190 kg) of prey overlapped with that of Asian tigers and

leopards.

According to a study by Aryal et al. (2015) on the habitat selection and feeding ecology of Dhole in the Himalayas, livestock made up the remaining 20% of the Dholes' diet, whereas blue sheep (13%) made up the majority of the 80% of the diet of wild prey species. Twenty prey species were discovered in research by Nurvianto et al. (2016) on the feeding habits of Dholes in Indonesia's Baluran National Park, with ungulates accounting for 95% of the prey species.

### Conclusion

The Dhole or Indian Wild Dog, Dhole, is one of the most remarkable and ecologically significant carnivores found in Asia. Its highly social behaviour, cooperative hunting strategies and adaptability to a wide range of habitats highlight its importance as a successful predator within forest ecosystems. By regulating populations of medium-sized ungulates such as sambar, chital and wild pigs, dholes contribute greatly to maintaining ecological balance and supporting healthy biodiversity. Their ability to coexist with larger predators like tigers and leopards through prey and temporal niche partitioning further demonstrates the complexity of predator interactions in natural ecosystems.

However, despite their ecological importance, dholes are facing a rapid population decline across their historical range. Habitat loss and fragmentation caused by deforestation, expansion of human settlements and developmental activities have significantly reduced suitable habitats and disrupted pack movement and breeding success. In addition, persecution by humans, depletion of prey species, competition with other carnivores and disease transmission from domestic dogs continue to threaten their survival. The species' endangered status and the existence of fewer than 2,500 mature individuals globally emphasize the seriousness of the conservation challenge.

India, particularly the Western Ghats, remains one of the most important strongholds for dhole conservation. Therefore, focused conservation actions such as habitat protection, landscape connectivity, disease monitoring and vaccination of domestic dogs, prey base management and public awareness programs are urgently required. Long-term ecological research and community participation are also essential to better understand dhole behaviour and ensure effective conservation planning. Protecting the dhole not only safeguards an

endangered species but also helps preserve the stability and health of entire forest ecosystems in which it functions as a key apex predator.

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