



# CANID NEWS

Newsletter of the Canid Specialist Group

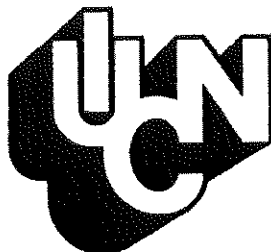
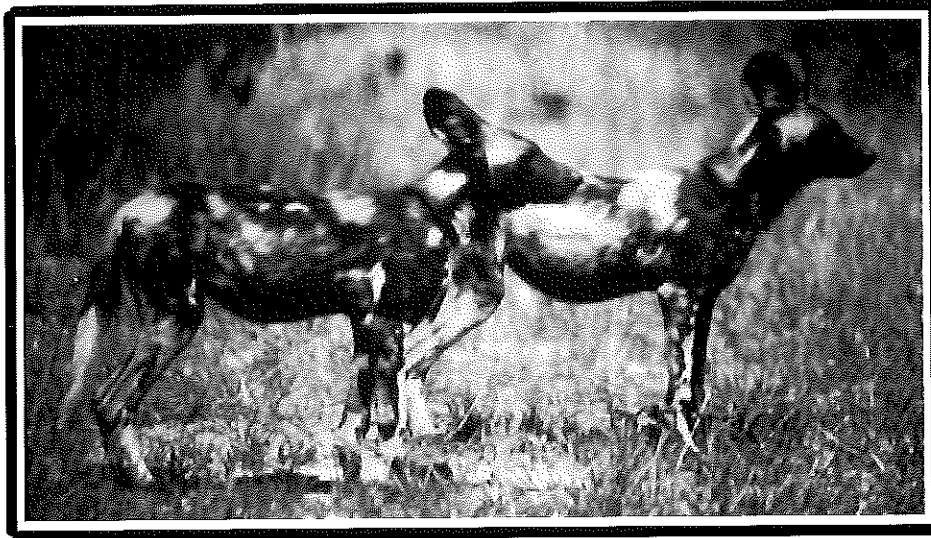
No. 1, January 1993

Edited by

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The aim of this newsletter is to provide a forum for the exchange and publication of information, ideas and opportunities among all those concerned for the welfare and conservation of canid species. The views expressed are those of the authors and do not necessarily reflect those of the IUCN or the Canid Specialist Group



The line drawings in this Issue were produced by **Mr. Wayne Clack**, at the Zoology Department, Oxford

COVER PHOTO: African Wild Dogs, *Lycaon pictus*, by **Joshua Ginsberg**

## *This Issue*

This is the first issue of Canid News! The contents and success of future issues depend on you, the readers.

Our aim is to provide a forum for technical articles concerning all aspects of canid conservation and management, and associated scientific topics. We also plan to include news items, a check on captive breeding, distribution maps and a recent bibliography. We will welcome feedback from readers on how the publication may best achieve its aims of fostering canid conservation. Canid News is produced by the World Conservation Union (IUCN) Species Survival Commission (SSC) Canid Specialist Group from its base in Oxford, UK.

The production of this first volume has been a weighty task, and has been made possible by the sponsorship of a grant from the Peter Scott Fund (via the Species Survival Commission) and the People's Trust for Endangered Species. The future of this journal depends on securing further sponsorship – even small donations will help so please consider making one (see back cover).

## *Future Issues*

We already have several fascinating articles for Issue 2, including a report on the Canid Specialist Group's *Lycan* PVA in Tanzania, an article on leishmaniasis in crab-eating foxes in Amazonia, and an article on wolves (incidentally, although wolves have their own Specialist Group, beyond the remit of the Canid Specialist Group, we will nonetheless be including them in Canid News).

You can help make the next issue more useful by, please, sending us (at the address below):

- 1) News items on canids
- 2) Information on forthcoming relevant meetings (and reports on previous ones)
- 3) Details of new publications (we would welcome reprints of articles too), including books suitable for review.
- 4) Advertisements for any jobs/studentships concerned with canids.

Please also offer articles (as appropriate we will organise peer review of submitted articles), but please correspond with the editors about the potential suitability of an article before submitting it. When articles are submitted they should be sent as paper copy (following J. Zool. Lond. format) accompanied, ideally, by an ASCII file on computer disc (preferably PC formatted 3.5"). Please send us the data to facilitate re-plotting of graphs in case there is difficulty translating your disc copies to our software. If, however, you use an Acorn computer, please submit material in any Archimedes software, accompanied by a paper copy.

## *Information Wanted*

We are also compiling distribution maps, lists of current canid research projects and records of captive breeding. Please send us any details you have relevant to the compilation of these databases.

## *Correspondence Addresses*

Please send all correspondence, articles, news items etc, and information relevant to the databases we are building up, to the Editors' address in Oxford. If you have any information concerning South America, particularly with respect to zoos, captive breeding and reintroduction, please contact Juli-ana Brandão in Rio de Janeiro.

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**The African Wild Dog, *Lycaon pictus*, is one of the most endangered canids. This Canid Specialist Group survey of its status and distribution lays the foundation for planning its conservation.**

The following report is adapted from "The African Wild Dog: An Action Plan for the Conservation of *Lycaon*." The Action Plan, edited by Joshua Ginsberg and David Macdonald, found its genesis in the *Lycaon* PVA that the CSG ran in Arusha, Tanzania, in March 1992. Originally the proceedings of the meeting were intended to be published independently of an Action Plan. However, after distribution of the PVA Minutes, it was decided to expand the scope of the proceedings and make a fully-fledged Action Plan.

A complete report on the status of *Lycaon* across Africa will be presented in the Action Plan, as will a complete bibliography for the species compiled by John Fanshawe and Joshua Ginsberg. In the following report I present a synthesis of data on the status and distribution of *Lycaon* in eastern and southern Africa since these regions were the focus of the PVA Workshop.

The single most important source of information on the continental status of *Lycaon* comes from the work of Lory H. Frame and John Fanshawe. In 1985, Frame and Fanshawe began a mail survey to assess the status of *Lycaon*. The results of this survey were the first concrete evidence that the species was in decline throughout much of its range. Unfortunately, the survey was never published in its entirety although it did receive wide circulation under the title of: **African Wild Dog *Lycaon pictus*: A Survey of Status and Distribution 1985-88**. The following status summary also includes information presented by country representatives represented at the *Lycaon* PVA. The names of those collecting data and reporting at the workshop are listed after the country name.

## Eastern Africa

### Ethiopia, Rwanda, Somalia, Sudan, Uganda, eastern Zaire.

Recent genetic and morphological analysis by Dr. R. Wayne, D. Girman, and colleagues has shown that eastern and southern wild dogs are distinct sub-species. Without a doubt, of these two sub-species the eastern is in far greater danger of extinction and has been extirpated over much of its former range. In three countries – Uganda, Rwanda and eastern Zaire – the species has been completely extirpated,

except for, perhaps, a small relict population in Upemba NP, Zaire. Recent surveys throughout Uganda confirm extirpation. In the Sudan, Somalia and Ethiopia, poor information and long-term civil strife have made ecological assessment difficult. Nonetheless, some data are available for these countries. What these data suggest is that no single population of *Lycaon* in these countries has any long term prospect for survival. Although the data may be incomplete, the prospects are poor generally.

In some areas in eastern Africa, particularly in the larger national parks in Zaire (Virunga NP, Garamba NP, Upemba NP), Rwanda (Akagera NP) and Uganda, the prospect of translocation or reintroduction of *Lycaon* has been mooted. Although this option is discussed to a much greater extent in the Action Plan, a brief digression is probably warranted. Although wild dogs, or any social carnivore, can be reintroduced from captive stock, success in this venture is poor. In

**Joshua Ginsberg** of the Institute of Zoology in Regent's Park London, was organizer of the *Lycaon* Population Viability Analysis meeting in 1992. His own research is on wild dogs in Hwange National Park, Zimbabwe.

addition, given the sub-specific differences recently elaborated by Girman, Wayne, and collaborators, the need for a source of animals from eastern Africa is a critical limiting factor. The soon to be published studbook for *Lycaon* shows that all *Lycaon* in captivity are of southern African origin. In addition, various aspects of *Lycaon*

sociality and ecology suggest that reintroduction, or translocation, will not be an easy task. Hunting techniques, predator avoidance, and knowledge of hunting areas – all must be acquired by captive-bred animals.

### Somalia

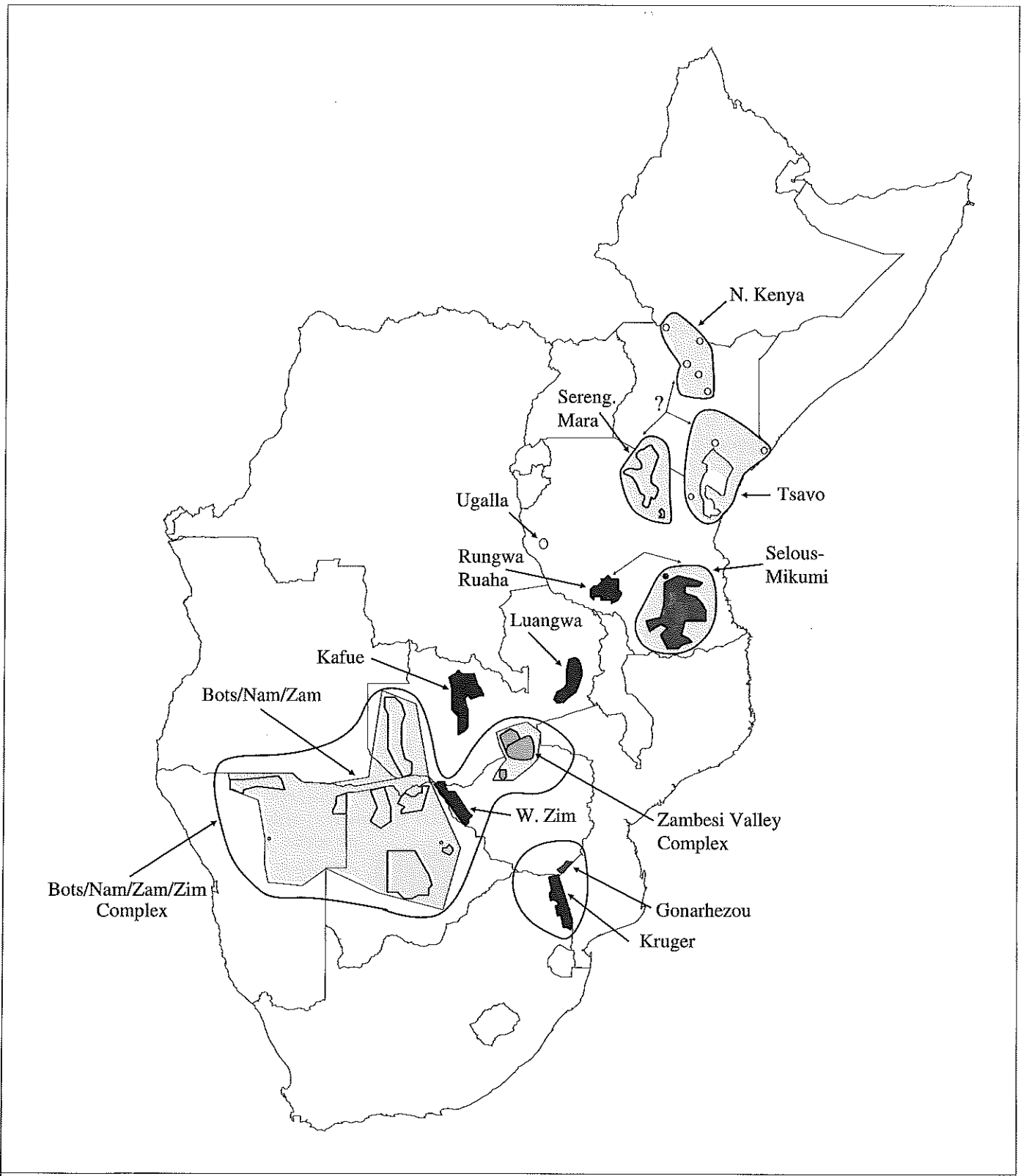
In Somalia, relict populations may exist in one or two areas, particularly in the vicinity of El Hamurra and in the south of the country near the Juba River. No information has been forthcoming in the last two years, but Frame and Fanshawe suggest that the woodlands south of Mogadishu have the greatest potential for supporting viable numbers of wild dogs and other wildlife populations in Somalia.

### Sudan

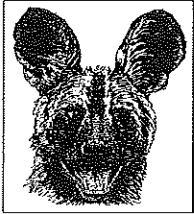
Sudan, like Somalia, is a war zone from which few data are collected, or have been collected in recent years. Recent reports, however, confirm that despite there still being prey available in some areas, *Lycaon*, and all other large carnivores, have been virtually extirpated over much of the country. The Nile floodplain, or Sudd, Boma National Park, and other areas in the south of the Sudan may support a small population, but no data are available. The only recent survey available for the Jebel Marra (12°50'N, 24°E) reports that wild dogs are extirpated.

### Ethiopia

*Lycaon*, although enjoying a wider distribution in Ethiopia than the critically endangered Ethiopian wolf (*Canis simensis*), is declining throughout its former range in



**Figure 1.** Map of southern & eastern Africa showing the distribution of *Lycaon* (see text for relevant details)



Ethiopia. *Lycaon* has been reported from a few national parks and reserves including Gambella NP (rare), Bale Mountains NP, Omo NP ( $\pm 15$  individuals), Mago NP ("common" – up to five packs present). In addition to these sightings, occasional sightings outside protected areas are reported.

### Kenya

(Ms. Kathy Alexander, Dr. Pieter Kat, Kenya Wildlife Service)

In Kenya and Tanzania, the quality of information on the status and distribution of *Lycaon* is relatively good. A survey by the National Museums of Kenya and the Kenya Wildlife Service (Pieter Kat et al.), following up on the work of Frame and Fanshawe, suggests that the status of *Lycaon* in Kenya has changed little over the last decade. Populations are thinly dispersed, widespread, and believed to be panmictic. In comparison with many parts of southern Africa and Tanzania, where the greatest numbers of the species are found in protected areas, *Lycaon* in Kenya appear to be found predominantly outside protected reserves and national parks.

Frame and Fanshawe suggest that as few as 15 packs roam widely over Kenya; recent data are less specific, but do not indicate that this estimate is unreasonable. The frequency of tourist visits to national parks and reserves, and the high density of research activities in Kenya give us a good picture of the occurrence of *Lycaon* in Kenya's many parks and reserves. Sightings have been reported from South Turkana National Reserve, Sambu/ Buffalo Springs, Kora National Reserve, Mount Kenya, Lake Nakuru National Park, Maasai Mara Game Reserve, Tsavo East, Tsavo West, the Dodori National Reserve.

In many areas, sightings are extremely infrequent (once per year or less). In other areas, such as the Masai Mara, population declines have been well documented. A six month

study of Tsavo found that although wild dogs are still present in the north and east of the park, their numbers are declining and sightings are extremely rare. Monitoring and long-term research continue under the supervision of Pieter Kat and Kathy Alexander, National Museums of Kenya, and the Kenya Wildlife Service.

### Tanzania

(Dr. Scott Creel, Mr. Gervase Moshe)

Tanzania offers the best long-term hope for the survival of *Lycaon* in eastern Africa. The long-term prospects for *Lycaon* in the north of the country are uncertain, and the decline and near disappearance of *Lycaon* in the Serengeti ecosystem does not auger well for long-term stability of northern populations. In the south several protected areas

### *"Tanzania offers the best long-term hope for the survival of Lycaon in eastern Africa"*

appear to support relatively large populations. Selous Game Reserve and the adjacent Mikumi NP may support the single largest population of *Lycaon* in Africa. Selous GR alone is 43,000 km<sup>2</sup>. Wild dog density on a study site of 1536 km<sup>2</sup> in the northern sector of Selous is unusually high (1 individual per 12-15 km<sup>2</sup>). Status in the Mikumi NP, contiguous with Selous G.R., is similar to that of Selous. In addition, sightings are reported in many areas bordering these protected areas (Kisarame and Rufigi districts, Runuwa region, Mbinga, Tindoro and Sengea districts). The Ruaha NP/Rungwa GR and adjacent Game Controlled areas also support a healthy population of *Lycaon*. Reports filed by the Project Manager of Rungwa/Kisigo G.R. estimate 20 packs for that area alone. In the absence of better data, an estimate of the total population size is in the range of 200 to 400 individuals. In addition, throughout much of southern Tanzania, occasional sightings are made outside protected areas.

Like Kenya, our knowledge about the status of *Lycaon* has benefitted from high tourist numbers, widespread concern among wildlife managers, and the efforts of individuals involved in wildlife research, and research on *Lycaon* in particular. Long-term monitoring of the population in the Serengeti continues by several people, and a research project in the Selous, under the direction of Dr. Scott Creel, should provide detailed information on the biology of the species in this region.

### Southern Africa

The status of *Lycaon* in southern Africa provides some hope for the long-term conservation of the species. Several reasonably sized (>250) populations remain. Many of these population are sufficiently proximate to other populations to allow dispersal, at least theoretically, between populations. After

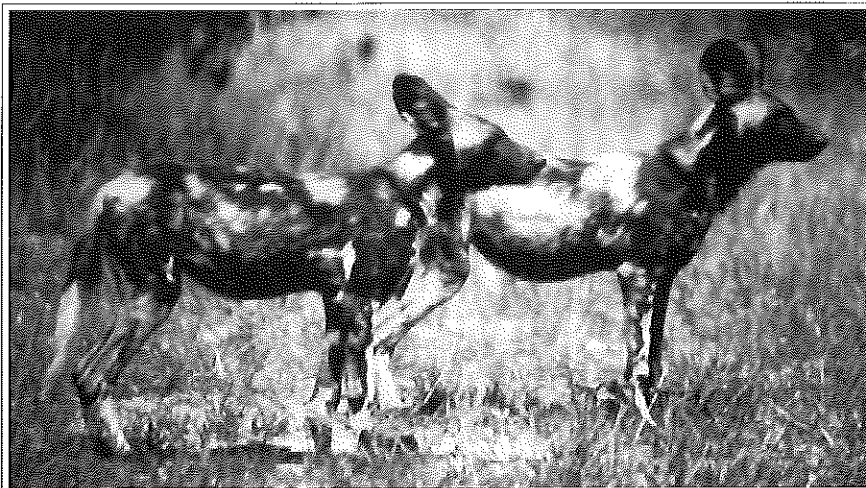


Figure 2. Wild dogs, *Lycaon pictus*



exhibiting a decline in numbers in the 1970's and 1980's there is even some scant evidence that populations may be increasing in some areas. The following reports, like those for eastern Africa, are summaries of those presented at the *Lycaon* PVA.

### Botswana

(Mr. Bart Van Depitte, Mr. John (Tico) McNutt)

Much of the data for this summary was collected by John Bulger in 1988/89, in a pamphletting survey with two objectives: 1) to estimate the distribution and density of wild dogs in Botswana and 2) to determine the extent of overlap with and depredation on domestic livestock in the region. There are three main areas in Botswana where wild dogs can be found. The most important area is in the north of the country, in an area of 176,000 square kilometres in the Ngamiland, Central and Chobe districts. This area includes the Okavango Delta and the Chobe-Linyanti River system, the Moremi Wildlife Reserve, Nxai Pan National Park, and the Chobe National Park. Rainfall in this area is approximately 350-700 mm per annum.

The estimate of the population for this area is a minimum of 42 packs representing 450-500 individuals. Mr. J. W. McNutt began a study of the ecology and behaviour of *Lycaon* in this area in 1989 in the Moremi Game Reserve, with a study area of 2600 km<sup>2</sup> in a livestock free area. This area currently supports 13 packs totalling 109 yearlings and adults. Data from this intensive study suggests that Bulger's minimum estimates are reasonably accurate and almost certainly low. None of these packs live entirely within the boundaries of protected areas.

Wild dogs are also found in the Ghanzi District (Kalahari Ecosystem, Central Kalahari Game Reserve, area: 55,374 km<sup>2</sup>) and the Kgalagadi District (Gemsbok National Park and Mabuasehube G. R. - 26,038 km<sup>2</sup>) with an annual rainfall of 250-300 mm. The total estimate for wild dog populations in these areas is 100-200.

The Moremi study population is representative of the population in northern Botswana. Based on Mr. Bulger's estimates, and recent findings in Kruger National Park by Ant Maddock, they estimate more packs of 2's and 3's in Botswana, as these tend to be overlooked by the pamphletting type of survey. For example, where Mr. Bulger estimated a minimum of 7 packs, with an average of 8-9 adults and yearlings, the McNutts have found 13 packs with an average of 5 adults and yearlings. This trend may be consistent throughout Botswana. Based on this and supported by KNP's analogous finding, the wild dog population in northern Botswana might be adjusted upward considerably. In any case, his conclusion remains the same in that Botswana's wild dog population is broadly distributed throughout the country.



### Namibia

(Mr. L. Scheepers, Mr. C. Grobler)

At present, wild dogs occur in a total area of approximately 131,000 km<sup>2</sup> of which only 9% has protected status. A survey of *Lycaon*, published by Hines in 1990, suggests that perhaps as many as 600 dogs presently exist in Namibia, mainly between the 300-500 mm isohyet region in the east of the country, bordering Botswana. However, it appears that there may be as few as 300 individuals remaining. Recent sightings include 50 known individuals in five packs in Bushmanland (19°30'S, 20°E), 3 packs in Caprivi (18°S, 21-24°E), one or two packs in Hereroland (20-21°S, 20-21°E), and an unknown number of animals in the Kavango-Kaudo GR.

Reintroduction programmes of wild dogs into Etosha National park failed three times, largely because captive bred animals had been used. These animals have died mainly because of predation by lions, wrong timing of translocation, and disease. The Ministry of Wildlife Conservation and Tourism has decided to:

- 1) Conserve wild dogs in their natural habitat by the involvement of the community and create an awareness of their vulnerability
- 2) Upgrade their status to that of a Protected Species
- 3) Only translocate wild dogs to Etosha originally from the Southern Africa Sub-region, and only in viable packs of wild dogs.

An integrated carnivore programme with the aim of creating a carnivore management plan was started in the Bushmanland/Kavango region in January 1992 by Philip Stander.

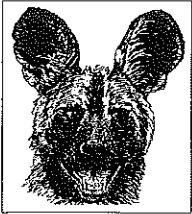
### South Africa

(Dr. M. G. Mills)

*Lycaon*, sometimes called the Cape hunting dog, is all but extinct in the Cape Province of South Africa. The last area of the Cape province supporting *Lycaon* is the Kalahari Gemsbok NP, where wild dogs are vagrants, packs occasionally visiting the area from Botswana. This habitat is marginal. *Lycaon* has been extirpated from Mountain Zebra, Karoo, Addo Elephant, and Bontebok NP.

In South Africa, *Lycaon* are found in two other regions.

***"At present, wild dogs occur in a total area of approximately 131,000 km<sup>2</sup>, of which only 9% has protected status"***



In the Hluhluwe/Umfolozzi Complex in Natal a small population of about 30 dogs has survived after being reintroduced into the 900 km<sup>2</sup> Game Reserve in 1980-1. A study of this population will begin in 1993. Kruger National Park (375 individuals present) is a large area of open/closed woodland with abundant prey, particularly impala. It is not clear what factors control the population, but it does not appear to be food limited. A detailed study on demography and factors responsible for mortality is at present being conducted in an area of 4,500 km<sup>2</sup> in the southern district of the park.

**Zambia**

(Mr. F. Munyenembe, Dr A. Tembo)

In an attempt to update the information on the distribution of the wild dog since the early 1950's, a PVA population survey was conducted by the National Parks and Wildlife Service. The distribution in the 1950-70's, although concentrated mostly in the game reserves and protected areas, covered a much wider part of the country than is represented in recent years. The records from the PVA questionnaire survey (see table below) do bring some hope: although there is a general decline in wild dog sightings in Zambia the distribution could still be wide and the species can be saved from extirpation. The causes of death of the individual animals reported in the questionnaire survey include snaring (1 case), motor vehicle accidents (3), lions (1), and disease (1). The numbers of deaths are indicative only of the diversity of mortality factors facing *Lycaon*. Most of these deaths can be avoided with planning and the involvement of the public.

There is a general lack of research into the management and conservation of the African wild dog in Zambia. The data presented are only an indication of, perhaps, a viable wild dog population in Zambia. To confirm the actual status, there

is urgent need to collect more information on the wild dog so that management and conservation efforts can be directed to those populations and areas worst threatened. A recent report confirms that *Lycaon* populations in South Luangwa NP have declined since the anthrax outbreak in 1987 and that there is cause for concern in this area.

**Zimbabwe**

(Ms. C. Davies, Dr. J. Ginsberg)

*Lycaon* populations in Zimbabwe are concentrated in four parts of the country:

1. **Zambezi Valley:** Charara, Urungwe, Sapi, Chewore, Dande, Doma Safari Areas, and Mana Pools National Park. There are 8 sightings from this area and no data for Sopi, Dande or Doma Safari areas. This area has a minimum of 58 dogs in 5 packs
2. **Chete/Chizarera/Chirisa/Matusadona:** we have 4 sightings from this region suggesting that there is a minimum of 2 packs comprising 20 dogs. There are no recent data for Chirisa, Chizarera or Matusadona, but we believe there to be a few small packs in these areas
3. **Gona re zhou:** we have 31 sightings from this area but have only used the 6 most recent ones. There is a minimum of 30-40 individuals in 2 packs
4. **Hwange, Matetsi, Kazuma, Pan, Deka, Panda-na-Sui, and Zambezi National Parks:** there is a total of 288 dogs in 35 packs in this area of 18,000 km<sup>2</sup>. 241 of these dogs in 29 packs occur in Hwange National Park and adjacent farming and forestry areas on its eastern boundary. Average density = 1/66km<sup>2</sup>.

The minimum estimate of wild dogs country-wide is approximately 386 dogs. There are probably no more than 600 dogs in the whole country. Data suggest that populations declined in the late 1970's and early 1980's and have been increasing since back to the 1976 level. They are increasing by about

6% per year country-wide and 7% per year in Hwange Park. Their range appears to be expanding particularly in the northern part of the country. Human attitudes and persecution remain one of the most serious threats to the conservation of this species.

	<u>Location</u>	<u>Km<sup>2</sup></u>	<u># Pks</u>	<u>Avg #</u>	<u>Tot #</u>
Luangwa Valley System	South Luangwa NP	9050	3	13	39
	Munyamdazi GMA	3000	2	18	36
	Musalangu GMA	17000	2	23	46
	Lumimba GMA	5000	1	20	20
	Lupande GMA	4000	2	21	42
	<i>Sub-total</i>	<i>38050</i>	<i>10</i>	<i>---</i>	<i>183</i>
Kafue National Park System	KNP	22500	22	12	264
	Kasonso Busanga	8000	2	15	30
	<i>Sub-total</i>	<i>30500</i>	<i>24</i>	<i>---</i>	<i>294</i>
	Lower Zambesi NP	4000	5	15	75
	Sioma Ngwezi NP	5000	1	5	5
	Liuwa NP	4500	1	12	12
	Tondwa GMA	2300	1	8	8
	<b>TOTAL</b>	<b>84350</b>	<b>42</b>	<b>---</b>	<b>577</b>



**Swift fox conservation has been beset by uncertainties of their taxonomy against a history of habitat loss. Their future in Canada relies on reintroduction.**

## Taxonomy & Status

The tiny arid land foxes unique to the North American Great Plains have gone through such a multiplicity of name changes since their first discovery by Europeans in 1823 that the Oglala Sioux name of Mee Yah Chah, meaning "the lousy one", must be the only constant one.

Mee Yah Chah, the swift fox, is a delicately beautiful animal, its grey-buff and ochre coat blending into the prairie landscape with only the black tip to its tail and black patches on either side of its muzzle standing out.

The smallest of North American canids, the swift fox weighs only 2.3 kg as an adult and must rely on something other than weight, fangs and muscle to survive. Its den preserves it; speed protects it and ensures its hunting success. Swift foxes can cover shortgrass prairie at more than 25 mph.

From the time of its first description by Say as *Canis velox*, and transferral by Audobon & Brachman to the genus *Vulpes* in 1823, the swift fox's taxonomic status has always been in dispute. As the Europeans expanded westward across North America the arid land and Great Plains foxes were given an increasing number of taxonomic descriptions: *Vulpes macrotis* (Merriam 1888), *Vulpes velox hebes*,



**Figure 1.** A swift fox, *Vulpes velox*

**Clio Smeeton** inherited a determination to conserve swift foxes from her parents who had created the Cochrane Wildlife Reserve in 1964. She now collaborates with the Canadian Wildlife Service in the Grassland National Park project to recreate the plains ecosystem. Most recently the Fauna & Flora Preservation Society has purchased kennels for her fox translocation.

*V. macrotis neomexicana*, *V. muticus* (Merriam 1902), *V. Arsipus* (Elliot 1903), *V. macrotis devius* (Nelson & Goldman 1931), and *V. macrotis zinseri* (Benson 1938).

Finally, in an attempt to organise the proliferating nominal Taxa descriptions they were all grouped under two headings and recognised as subspecies of, or synonyms for, *Vulpes velox* or *Vulpes macrotis*, the swift and kit fox (Seton 1929, Benson 1938, Grinnel 1933). The arguments for and against subspecies recognition have never been settled, in most part because the foxes described have been extirpated over most of their range. By the time the swift fox (*Vulpes velox*, or *Vulpes velox hebes*) was recognised as a species, it had vanished from its Canadian locale.

This uncertainty has affected many attempts to conserve the threatened populations of this tiniest Great Plains canid, and has made it difficult to establish population numbers. It has also produced a paradox in that the North American swift and kit foxes are harvested in the US where remnant populations still occur, whilst being protected in Canada, where they are extinct.

In the USA there have been no national, or State by State swift fox surveys. Within the swift fox range, three States list it as an endangered species and provide protection: North Dakota, where it is extirpated, South Dakota where there is an estimated population of 50-100 animals, and Nebraska where the unknown population is believed to declining over most of the State. In Montana, where no swift fox other than radio-collared animals from the Canadian reintroduction programme have been sighted, it can be hunted, poisoned, and trapped outside the closed season. In Wyoming the swift fox can be trapped, shot and poisoned at any time of the year.

In the remaining seven States it is classed as a "furbearer", governed by hunting and trapping regulations applicable to other commercially harvested species. In Minnesota and Iowa no sightings have been reported for many years. In Oklahoma, Texas and New Mexico the population status is unknown, and both *Vulpes velox* and *Vulpes macrotis* are lumped together as one. In Colorado, where its status is classed as "not common", the swift fox is hunted and trapped. In Kansas the status is guessed to be "common", and furbearer hunting/trapping regulations apply.

In Canada the species is classed as "Extirpated". The last swift fox was sighted in Saskatchewan in 1930.

Merriam's 1902 subspecies classification of *Vulpes velox* and *Vulpes velox hebes* could well be substantiated by current genetic research, if funding to collect the blood samples from the South Dakota population is obtained before that population declines completely.

The recent and ongoing genetic DNA research of Dr. Robert Wayne has shown that the swift fox (*Vulpes velox*) of the Northern high Plains and the kit fox (*Vulpes macrotis* and



*Vulpes macrotis mutica*) of the Southern Plains and the San Joaquin valley are distinct from each other. Although no overall population surveys have been done on the United States' swift and kit foxes, Dr. Wayne's findings in dividing swift from kit fox will have halved the guesstimated numbers of these animals in the wild.

## Causes of Decline

All the time that these little foxes (under any of their names) were being added to the scientific lexicon of North American species, their habitat was being rapidly changed.

In less than 150 years a sweeping landscape, dominated by grasses, the prairie dog (*Cynomys*) and the North American bison (*Bison bison*), was transformed into a severe patterning of checkerboard grain crops. The low western wheatgrass, buffalo grass and blue grama grass had gone, their place taken by squares of tawny gold or black ploughed land filled with fertilizers, herbicides and pesticides. A land where, in the "dirty thirties", dust devils and the ever-present prairie wind had whirled the humous of thousands of years into the air to drop in measureless tons on New York and the Eastern Seaboard.

The ideas of two Illinois inventors of the mid 1800s, John Deere and "Uncle Joe" Gliddon, have had a profound effect on the survival of the swift fox. John Deere's prairie plough made it possible for a farmer and three-horse team to break an acre of virgin prairie in a day. The three-horse team has given way to huge tractors pulling ten-bottom ploughs

which have torn off the delicate membrane of tough rooted grasses shielding the soil from the wind. The stripping metal bow of the ploughshare delved into and destroyed the foxes' earths.

Swift foxes use their earths year round. The earths are expanded from a vacated prairie dog burrow, abandoned American badger's sett, or coyote's hole. The many entrances, 18-23 cm in diameter, lead 76-90 cm below the surface into a tunnel system extending from 4.5-9 m. One earth alone is not sufficient for a swift fox's needs. These elaborate earths shelter the swift fox against people, coyotes and eagles. The insulating earth protects them from the soaring heat of summer, the bitter winter cold, and from the ever-present winds. John Deere's invention stole that shelter and left the swift fox unprotected.

"Uncle Joe" Gliddon was granted a patent for barbed wire on 8th December 1874, and the prairie biome was changed for ever. Barbed wire protected the land from the plough, preserving it for cattle. In the eye of the rancher the prairie dog, the prairie wolf and the coyote threatened his cows, and poison was his answer.

The intensive poisoning programmes for coyote and wolf decimated the swift fox. The eradication programmes to remove the prairie dog wiped out the black footed ferret and swift fox too, removing in one fell swoop protection, shelter and food source. The poisoning programmes for the "control" of prairie dog towns in the US are still in operation. In Kansas, for example, if a rancher does not want to poison prairie dogs on his own land for environmental reasons, the state has the right to come in, poison the prairie dogs, and send the rancher the bill.

In Canada it was the Saskatchewan Natural History Society which, in the 1960s, pushed for the protection of the last of Canada's prairie dogs. They started a groundswell of public opinion resulting in the 1990s' acquisition of land and establishment of the Grassland's National Park. Grassland's National Park, once completed, will be the last substantial representation of prairie grasslands left in North America; prime swift fox habitat preserved in perpetuity.

## Swift Fox Biology

Where prairie dog towns are established they form the prey base for the swift fox, supplemented by thirteen lined ground squirrels, pocket mice, kangaroo rats and other small rodents. In late summer and autumn the foxes' diet widens to include grasshoppers, newly fledged

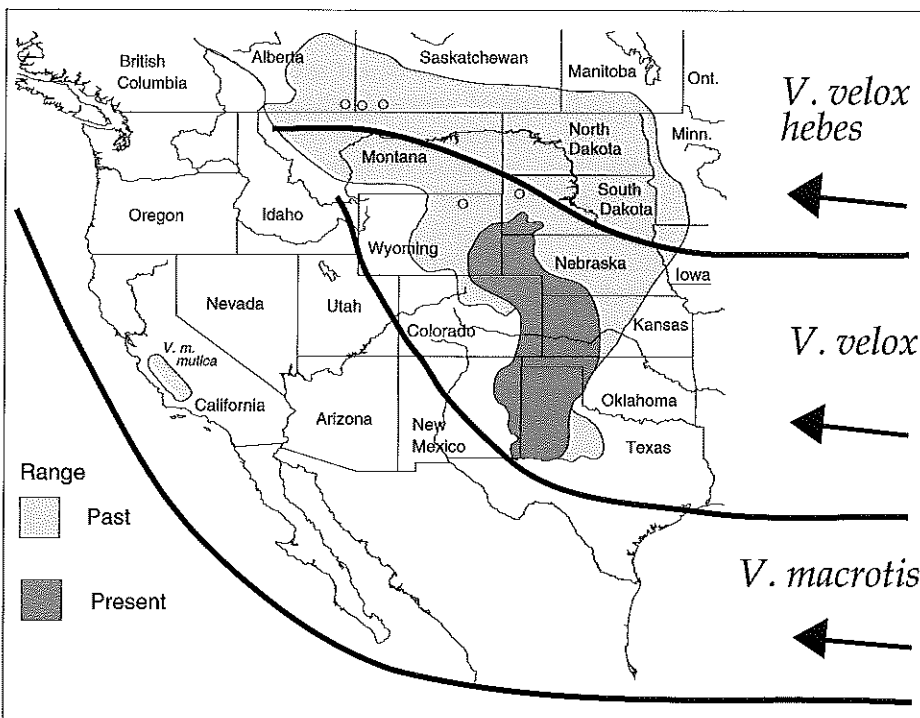


Figure 2. Map of the past and present range of the swift fox



flying ants, army worms, crickets, frogs, lizards, horned toads, small passerine birds,

berries and grass. The swift fox breeds from December to February, depending on latitude; later in the North, earlier in the South. At this time the foxes are very vocal, calling through the long cold nights. The gestation period is c. 50 days. After whelping, the vixen will stay within the den with the cubs, while the dog fox hunts and feeds her. Three weeks after they have been born the cubs begin to explore the entrances of their earth and by the fifth week will be spending several hours above ground each day, with both parents providing food for them. Should the vixen be killed at this time the male will raise the cubs on his own. The family stays together as a unit, moving from earth to earth, pressured by parasites and prey availability, until the early autumn when the cubs disperse.

### Conservation and Reintroduction

The attempt to reintroduce the swift fox to Canada began in 1971. The Cochrane Wildlife Reserve, founded in 1964, has bred swift foxes for reintroduction since this time, seven years before the species was declared extirpated in Canada in 1978. The Cochrane Wildlife Reserve now holds the largest breeding colony of the swift fox.

In 1970, when the first two pairs of swift fox arrived at the Reserve, sent from a Wildlife Rehabilitation Centre on the Wyoming/Colorado border, the swift fox was of no interest to either of the countries encompassed by its range.

The first pairs bred at the reserve in 1971, and soon were joined by 8 animals from the Pawnee National Grasslands, 5 foxes from the Pine Ridge Indian Reservation in south Dakota, and 2 more whose capture point is unknown. Founder foxes have continued to be added to the breeding colony almost yearly. In 1978, when the swift fox was designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, their ownership was changed by the stroke of a bureaucrat's pen from the Smeeton family to the Canadian Wildlife Service. This change of ownership was a paper transaction only, although from 1978-1990 the Canadian Wildlife Service was able to contribute \$9,000 per year towards the costs of the breeding programme.

As the colony slowly grew, the Calgary Zoo, Moose Jaw Wild Animal Park and the Edmonton Valley Zoo became participants in the programme, the Calgary Zoo undertaking all veterinary work for the Cochrane Wildlife Reserve as well as studbook management for the programme. Although the

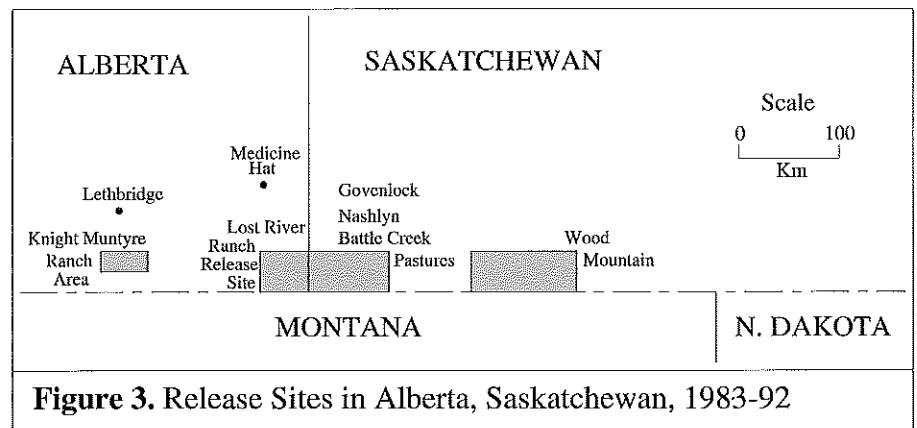


Figure 3. Release Sites in Alberta, Saskatchewan, 1983-92

swift foxes are owned by the Crown, no government funds are earmarked for captive breeding so the Canadian Government, both Provincial and Federal, relies upon the breeding institutions to find all the funding for the swift fox captive breeding programme, veterinary care, tattooing, studbook management, pathology for both captive animals and release deaths, and transport to and from release sites. Federal and Provincial funds have been expended on research into suitable release habitat for the foxes and on monitoring after release.

Swift foxes have bred in the wild in the release sites since first released in 1983. The estimated survival rate in the release sites for reintroduced captive raised cubs of the year is 33%. Estimated survival rate for first year cubs in South Dakota is 20% and in Bakersfield it is 15-17%. Known yearly recruitment in the release sites seems to outweigh known mortality, although only a very small percentage of the released foxes have been radio-collared. Numbers of animals released initially were small, but by 1990 the breeding facilities were able to produce between 67 and 110 animals for release per year. In the last 10 years, a total of 500 animals has been released over 4 large release areas in two provinces, Alberta and Saskatchewan.

The Cochrane Wildlife Reserve brought the first swift fox back to Canada and it is their aim to be permitted to comply with the IUCN's Mace Lande Criteria for a minimum self-sustaining population in at least two of the release sites and thus to have reintroduced successfully an extirpated species into its original Canadian range.

Since the European invasion the Great Plains have been ravished; between ploughing, irrigation, over-grazing, within a very short time the prairie ecosystem has become one of the most extensively altered in the world. In Canada, the rescue of a small part of the grasslands which once spread their richness before the wagons of the settlers has started with the establishment of Grassland's National Park, the protection of the prairie dog and the reintroduction of the swift fox.

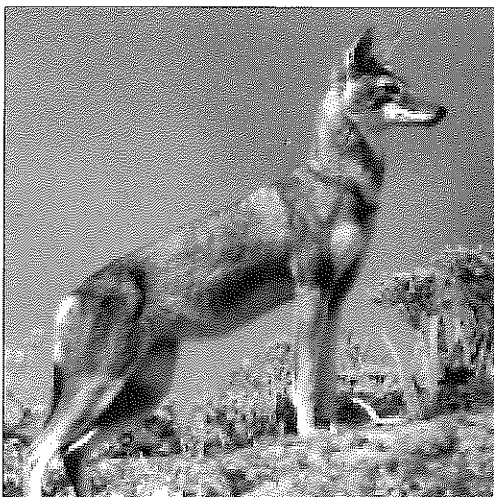
***"In the last 10 years a total of 500 animals has been released over 4 large release areas in 2 provinces"***

## The Plight of the Ethiopian Wolf

The mobility and adaptability of members of the dog family have enabled them to fan out and inhabit nearly every ecosystem in the world. Most canids are generalists and are widely distributed. A few have become specialists and have restricted distributions, such as the rare Ethiopian Wolf (*Canis simensis*). A long-legged red canid, also known as Simien Fox or Simien Jackal, it survives in only half a dozen mountain pockets in Ethiopia (Gottelli & Sillero-Zubiri, 1992).

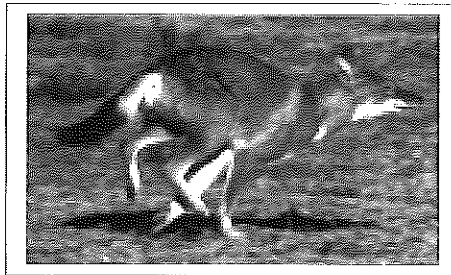
The wolves' adaptation to life on the rodent-rich Afro-alpine highlands may yet prove to be their downfall. Such habitat has been shrinking since the conclusion of the Pleistocene age. Increasing human pressure for resources such as high altitude grazing and agriculture, and direct persecution are imposing an increasing toll upon the rapidly diminishing populations of Ethiopian Wolves. Fewer and fewer mountain sanctuaries are left for the few hundred wolves that still survive, with the largest and probably only viable population found in the Bale Mountains National Park in southern Ethiopia.

Until recently only the Bale Mountains wolves were free from serious human threats, coexisting peacefully with the Oromo pastoralists with whom they share the Bale



highlands. Following the overthrow of Mengistu's government in May 1991, however, peaceful coexistence turned into persecution. Unrest and uncertainty mounted in the countryside as a result of the lack of law enforcement and anarchy that followed the end of 17 years of armed strife. Many people in the Bale Mountains took advantage of the situation and moved inside the Park, cutting trees, burning and clearing heather for agriculture and grazing, and killing wildlife. Automatic weapons sold by run-away soldiers became widely available and wolves and other animals became shooting targets. The killings were probably fuelled by old grudges against the Park administration.

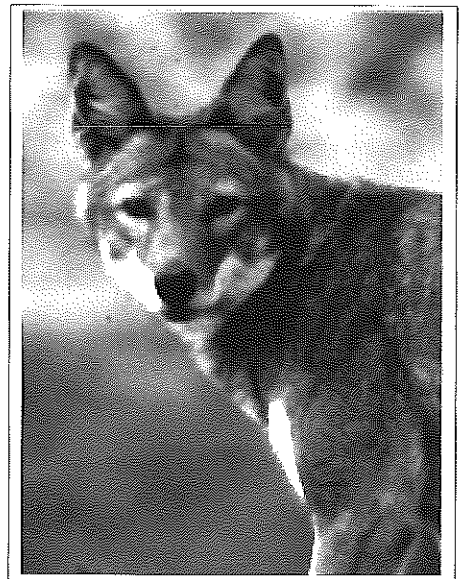
In late 1991 we documented the killing of at least six adult wolves. The death of a nursing female soon resulted in the starvation of her three-week old litter. In another pack a subadult male



was shot while guarding the den and his carcass used to plug the den entrance, choking two three month old pups.

In an attempt to restrain the killings, we visited settlements inside Bale Mountains National Park and began an education campaign with the assistance of local political groups. The slaughter subsided after lengthy discussions with the local elders, but the threat is likely to persist until most guns are confiscated. Conservation awareness and tolerance towards wildlife will be possible only when direct benefits of conservation, such as tourism and sustainable use of wildlife, reach the local community.

The crisis faced by the wolves in Bale is far from over. In December



1991 more animals were found dead, and soon after, whole packs disappeared. Pathological analysis confirmed some had died of rabies. By the end of March, 36 of 50 adult animals belonging to five packs had died, including two whole packs. At least two litters also perished. Rabies in domestic dogs is not unknown in the Bale Region; the disease has probably spread via infected dogs to susceptible wildlife.

The extent of the rabies out-break in Bale is not clear, but the implications for the wolf's long term survival are serious. For small, relict populations, an out-break of disease can cause extinction (e.g. Black-footed ferret, *Mustela nigripes*, where the wild population was reduced to less than twenty due to distemper). While disease is a normal component in the dynamics of most animal populations it is potentially damaging to an endangered species of which there are probably fewer than 500 surviving individuals.

With the current rate of habitat destruction, persecution and disease, captive breeding has become a critical priority for the Ethiopian Wolf. While the survival of any endangered species cannot be assured by simply keeping its last survivors in captivity, this has become an important tool for wildlife conservation. A captive breeding programme for the Ethiopian Wolf will



assist in maintaining the genetic diversity of diminishing populations and will develop a nucleus population safe from threats and natural hazards. Eventually, animals born in captivity could be reintroduced into suitable habitat from where they had gone extinct, or could help reinforce genetically depressed populations.

The transitional Government of Ethiopia understands the magnitude and urgency of the problem and wants to start a captive breeding programme, but the export of Ethiopian wolves to a suitable breeding facility outside Ethiopia remains a delicate issue. While the establishment of a captive breeding facility in Ethiopia is a valid option, the initial stage of a breeding programme for a species that has never been kept in captivity should take advantage of existing facilities, technology and expertise in the developed world. Those institutions involved in the programme should provide funds and expertise to develop a breeding facility in Ethiopia to which captive born animals could be returned to initiate a second breeding nucleus. Both approaches are mutually supportive and will help to secure the survival of the Ethiopian Wolf. However, any successful programme must ensure the protection of the species' Afro-alpine habitat, without which the long term survival of the wolves, and many other animal and plant species that evolved in the unique moorlands of the roof of Africa, will not be possible.

Action is needed now; negotiations to make the programme possible are likely to be lengthy and complex. Meanwhile, one of the most interesting creatures ever to inhabit the African highlands may be on its way to extinction.

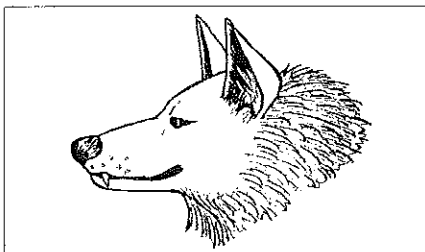
**Claudio Sillero-Zubiri  
& Dada Gottelli**

Reference

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## Yellowstone Wolves

Recent reports from Wyoming have revealed that the Greater Yellowstone Ecosystem (GYE) clearly appears to host a population of wolves. On 30th September 1992, a hunter shot and killed one member of a pack of 6 or 7 wolves. It was a black wolf, weighing 42 kg, which was presumably mistaken for a coyote. Because the hunter has been very cooperative, however, the US Fish and Wildlife Service does not intend to press charges. The potential penalty for killing a wolf could be as high as \$100,000 and a year in jail.



Two of Yellowstone's most able rangers confirmed sighting the other pack members when they went into the Teton Wilderness to secure the carcass. There was apparently considerable variation in size amongst members of the pack, leading to speculation that perhaps a pair of wolves bred somewhere in the GYA this year, and that the pack is a family group.

Substantial press has appeared regarding another black wolf (definitely not the same one that was shot) filmed in the Hayden Valley of Yellowstone a few months ago. There are also numerous consistent and reliable reports of another wolf in the Heart Lake area in the southern Yellowstone National Park. All this is extremely exciting because the implication is that no compromise to endangered species status will be necessary in order to have wolves back in the GYA.

If wolves had been released in the area, they would fall under the "experimental population" status which would permit much greater latitude in

management than is afforded under the Endangered Species Act. Work on the Environmental Impact Statement regarding wolf recovery will proceed as planned, but I suspect that the occurrence of wolves in the GYA will lead the federal government to abandon its proposal for release of wolves from Canada.

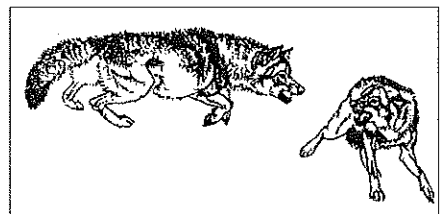
**Mark S. Boyce**

## Book Review

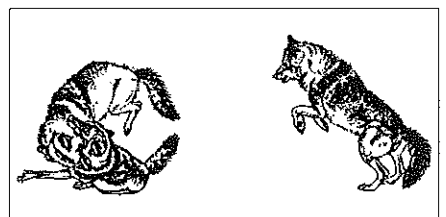
### "Wilk ("The Wolf")"

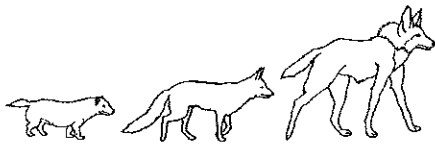
by Henryk Okarma

"Wilk" is a monograph of a species describing wolf life in relation to three aspects: individual (morphology, physiology, growth, and diet), population (distribution, social structure, and behaviour), and ecosystem (hunting behaviour, selection of prey, and defence strategies of prey). The last part concerns techniques used for hunting wolves, both historical and contemporary.



Although this excellent looking book (168 pp) is mostly in Polish, the final chapter is in English, and contains concise and clearly presented information about the status and biology of wolves in Poland. The book is nicely illustrated throughout, as these extracts show, and contains a list of 213 scientific references.





All the information for this Issue's **Zoo News** comes from a census of Brazilian Zoos, conducted by the Brazilian Zoo Society (SZB) in 1991. The results have been collated for the CSG by our South American contact, Juli-ana Brandão. Not all zoos replied to the questionnaires that were sent to them, so this information is not complete. SZB are conducting a new census, the results of which will be ready in March 1993, and the CSG will also be conducting a Brazilian Zoo survey by questionnaire in the near future. We will therefore be publishing more up-to-date information in a later Issue. After assessing the level of response from Brazil, the CSG plans to extend the zoo survey across all of South America, and hopefully the rest of the world. We will publish the results of these surveys in **Canid News**.



**Juli-ana Brandão** is a Brazilian biologist who is undertaking a study of captive breeding of canids. She is hoping to contact all South American Zoos, so if you have information for her, please contact her in Rio de Janeiro, at the address given on page 1 of this Issue.

## Hoary zorro

### *Dusicyon vetulus*

Zoo	M	F	U	Births
Brasília	1	3	0	0
Goiania	1	1	0	0
Curitiba	2	1	0	0
Salvador	2	4	0	0
Lins	1	1	0	0
B. Horizonte	2	3	2	4
Fortaleza	3	0	0	0
Sao Paulo	0	0	2	0
Araxa	0	2	0	0
F. Rio Zoo	1	0	0	0
<b>TOTAL (31/12/91)</b>	<b>13</b>	<b>15</b>	<b>4</b>	<b>4</b>

SUMMARY (31/12/91):-  
 Total number of zorros: **36**  
 Births over last 12 months: **4**  
 Deaths during 1st month of age: **4**  
 Deaths over last 12 months: **12**

## Crab-eating zorro -

### *Cerdocyon thous*

Zoo	M	F	U	Births
Andradina	1	0	0	0
Cascavel	0	2	0	0
Americana	1	1	0	0
Aracatuba	1	1	0	0
F. Rio Zoo	3	5	0	0
Vargem Grande	1	1	0	0
Aracaju	2	1	0	0
Bauru	2	1	0	0
Maringa	2	2	0	0
Campinas	0	3	0	0
Sao Paulo	4	4	0	0
Goiania	1	2	0	0
Lins	1	0	0	0
Curitiba	7	0	0	0
S.J. Rio Pardo	0	1	0	0
Piracicaba	2	1	0	0
Taboao	2	1	3	3
Leme	1	0	0	0
Carajas	1	0	0	0
Muriae	1	0	0	0
B. Horizonte	1	0	0	0
Ilha Solteira	0	2	0	0
Brasilia	1	3	0	0
Varginha	1	0	0	0
Guarulhos	3	0	0	0
Pomerode	2	2	0	0
Sapucaia	2	1	0	0
Mogi Mirim	0	1	0	0
Sorocaba	4	2	0	0
Recife	3	2	0	0
<b>TOTAL (31/12/91)</b>	<b>50</b>	<b>39</b>	<b>3</b>	<b>3</b>

SUMMARY (31/12/91):-  
 Total number of zorros: **95**  
 Births over last 12 months: **3**  
 Deaths over last 12 months: **0**

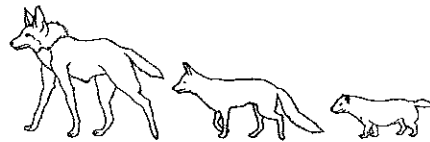
## Crab-eating Zorro -

### *Cerdocyon thous azare*

Zoo	M	F	U	Births
F. Rio Zoo	1	0	0	0
Aracaju	2	1	0	0
<b>TOTAL (31/12/91)</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>

SUMMARY (31/12/91):-  
 Total number of foxes: **4**  
 Births over last 12 months: **0**  
 Deaths over last 12 months: **0**

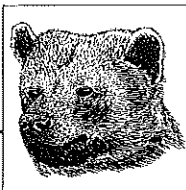




## Azara's Zorro - *Dusicyon gymnocercus*

Zoo	M	F	U	Births
Sapucaia	5	3	0	0
<b>TOTAL (31/12/91)</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>

SUMMARY (31/12/91):-  
Total number of zorros: **8**  
Births over last 12 months: **0**  
Deaths over last 12 months: **0**



## Bush Dog - *Speothos venaticus*

Zoo	M	F	U	Births
Curitiba	1	0	0	0
Ilha Solteira	3	3	0	5
Sao Paulo	1	2	0	0
<b>TOTAL (31/12/91)</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>5</b>

SUMMARY (31/12/91):-  
Total number of dogs: **15**  
Births over last 12 months: **5**  
Deaths during 1st month of age: **5**  
Deaths over last 12 months: **10**



## Grey Wolf - *Canis lupus*

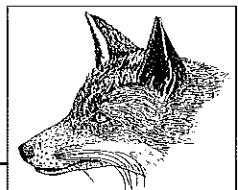
Zoo	M	F	U	Births
Sao Paulo	1	2	0	0
Recife	0	1	0	0
<b>TOTAL (31/12/91)</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>

SUMMARY (31/12/91):-  
Total number of wolves: **4**  
Births over last 12 months: **0**  
Deaths over last 12 months: **0**

## Maned Wolf - *Chrysocyon brachyurus*

Zoo	M	F	U	Births
Andradina	0	1	0	0
Sapucaia	1	1	0	0
Uberlandia	0	1	0	0
Aracatuba	0	1	0	0
Sorocaba	3	2	0	3
Bauru	2	2	0	2
Cascavel	1	0	0	0
Americana	2	2	0	0
F. Rio Zoo	2	2	0	0
Curitiba	5	2	0	0
Araxa	2	5	0	4
Piracicaba	1	2	0	0
Sao Paulo	6	2	0	0
Goiania	5	2	0	0
B. Horizonte	3	2	0	3
Sao Carlos	1	2	0	1
Brasilia	5	2	0	0
Taboao	1	1	0	0
Leme	2	1	0	0
Paulinia	1	0	0	0
Ilha Solteira	2	0	0	0
Mogi Mirim	2	1	0	4
Varginha	1	2	0	4
Pedreira	1	0	0	0
<b>TOTAL (31/12/91)</b>	<b>49</b>	<b>36</b>	<b>0</b>	<b>21</b>

SUMMARY (31/12/91):-  
Total number of wolves: **106**  
Births over last 12 months: **21**  
Deaths during 1st month of age: **10**  
Deaths over last 12 months: **37**



## Red fox - *Vulpes vulpes*

Zoo	M	F	U	Births
Joao Monlevade	0	0	1	1
<b>TOTAL (31/12/91)</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>

SUMMARY (31/12/91):-  
Total number of foxes: **2**  
Births over last 12 months: **1**  
Deaths over last 12 months: **0**

**Turtles and Canids:**  
*notes on predation and competition in Turkey*

Today all seven species of marine turtle are threatened by extinction as a consequence of hunting, environmental change and other human activities. As a result, the reduced turtle populations are now sensitive to the effects of predation at breeding grounds (Frazer 1992). If these populations are to survive then predation pressure has to be assessed and control programmes will have to be implemented where necessary.

We have just completed a pilot study of predation of marine turtle nests in Turkey, which is thought to hold the largest remaining nesting population in the Mediterranean (Canbolat 1991). Our survey focused on Dalyan in the western Mediterranean, and Akyatan on the eastern coast. Predators were identified from prints and scats, which we collected and analysed.

**AKYATAN:** The main species nesting in this area was the green turtle (*Chelonia midas*). Red foxes (*Vulpes vulpes*) and golden jackals (*Canis aureus*) were found to occur in this area. We recorded predation at 75% of all nests observed. The majority of this predation was on eggs, but some hatchlings were taken at emergence.

Prints and scats around nest sites showed that foxes and jackals were responsible for nest predation. This overlap in diet was not limited to turtle eggs. In faecal analysis there was no statistically significant difference between these sympatric canid species in the percentage frequency of prey remains (see Figure 1). Using both percentage frequency of occurrence

and percentage volume estimates, mammalian prey remains were most abundant. Remains of both mice and voles were found in scats of both canids. 74% of all teeth found in scats were identified as mole voles (genus *Ellobius*) (Ognev 1950). Very few scats contained turtle egg shells. Both species tended to lick out the egg contents leaving the shells, making it difficult to assess the relative dietary importance of eggs.

items, between Dalyan and Akyatan.

During this season an experimental control programme was initiated at Dalyan in collaboration with our colleagues from Hacettepe University. Nests were protected by burying a wire mesh square directly over the nest chambers. The preliminary results were very promising.

Our study highlights the problems of assessing prey importance from faecal analysis. Only through observations were we able to assess the extent of canid predation on turtle nests. However, the dietary study has shown that the foxes and jackals have access to a wide array of food types and it may be that turtle eggs are only a "luxury item", perhaps making a nest protection programme more feasible. The differences found between fox diet in the two areas reinforce the red fox's opportunistic reputation.

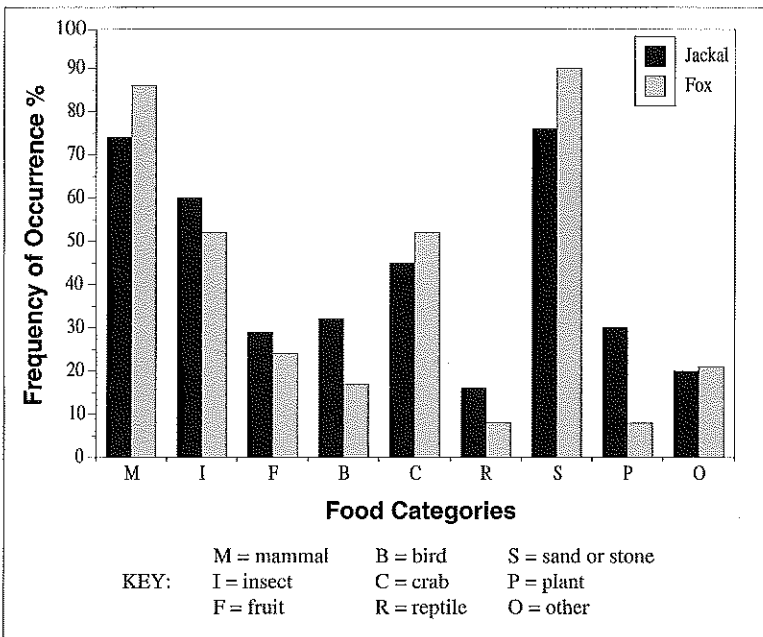
Finally, and perhaps most interestingly, our diet analyses reveal no statistically significant difference in the diet of these two sympatric canids at Akyatan during

the summer months of 1992. In so far as it is correct to infer interspecific competition from this result, clearly it would be interesting to know if there is niche separation at some other season.

**Lorna Brown & David Macdonald**

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Canbolat, A.F. 1991. Dalyan kumsali (Mugla, Turkiye) 'nda *Caretta caretta* (Linnaeus 1758) populasyonu uzerine inclemeler. Tr. J. Zool., 15: 255-274.  
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**Figure 1.** Comparison of frequency of occurrence of prey items for foxes and jackals at Akyatan

**DALYAN:** At Dalyan the only nesting turtle species was the loggerhead (*Caretta caretta*) and red foxes were the only canid species present (their interactions have been studied by a team from Hacettepe University, e.g. Canbolat 1991). Fox predation occurred within 48 hours of the nest being laid and eggs were frequently cached for later consumption. The return rate to these caches was high – 94% of all caches were eaten within 4 days of making.

At Dalyan mammalian prey remains were rare in fox scats, and insects were the predominant food. The fox's diet differed significantly in terms of the frequency of occurrence of prey



The impact of hunting on many canids is a perplexing unknown. In Argentina a new project seeks to quantify this for the culpeo.

## The Hunting Problem

Wildlife trade is an important component of Argentina's economy. Legal exports of wildlife products can reach US\$100 million per annum (Ojeda and Mares, 1982; Cajal, 1986) with up to \$200 million being made in the illegal market (Clarín, 1990).

Wildlife hunting is an important source of income for people in rural Argentina. In Patagonia, more than 100,000 foxes (culpeos, *Dusicyon culpaeus*, and grey foxes, *Dusicyon griseus*) are hunted for their fur annually (Rabinovich et al., 1987). At approximately \$10 for each fox skin in Patagonia, this represents more than \$1 million pa income to local people in the region. Each ranch worker that hunts usually captures 10-20 foxes pa, which represents 50-100% of a monthly salary.

Despite this commercial significance, there is scant information on the status of Argentina's hunted species, or on the impact of hunting on their populations; the foxes are no exception. For the culpeo fox the impact of commercial hunting is added to that of predator-control programmes (Bellati and Von Thungen, 1987). Culpeos prey on sheep, and in many areas of Patagonia, particularly in Chubut and Santa Cruz Provinces, they are killed with poison which also

damages non-target species.

Decisions about management of Carnivores in Argentina are based, at best, on evaluations of the changes in the numbers harvested or exported in recent years. These numbers depend on both population sizes and hunting pressure, which are variable and difficult to assess.

## Harvesting Trends

Figure 1 shows the annual legal exports of Culpeo pelts from Argentina between 1976-1990 (data from Fujita and Calvo (1982), Gruss and Waller (1988), CITES Secretariat, and Dirección Nacional de Fauna Silvestre, in García Fernández (1992)). Annual figures ranged from 8,524 pelts in 1977 to 138 in 1985, with a marked decline in exports during the 1980's which was paralleled for the grey foxes (García Fernández, 1992). This decline might represent decreasing population numbers, decreasing international demand, or the high black market value of foreign exchange during the early 1980's, which encouraged illegal exportation of wildlife. Unfortunately there are no data on domestic use of fox pelts, although it appears to be significant in the case of the culpeo (García Fernández, 1992).

Andrés Novaro, having completed a Masters on the culpeo, is now undertaking a doctorate through the University of Florida on the ecology and conservation of this species. Since 1989 he has been the prime mover in surveying the impact of hunters on this species.

For the culpeo harvest, only fragmentary information is available. In Neuquén Province, in northwest Patagonia, culpeo harvests parallel its export nationally (Figure 2). A marked decline during the late 70's was interpreted by the provincial administration as a decline in population. Hunting of culpeos was banned in Neuquén during 1981 and 1982, but since the ban was lifted in 1983 the legal harvest has not recovered.

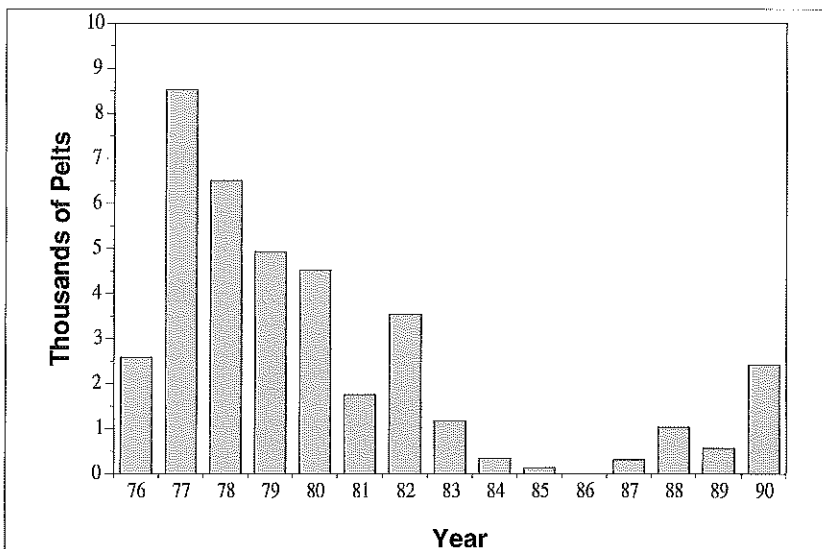
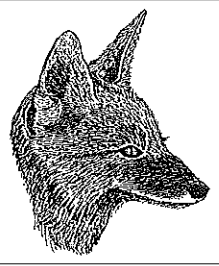


Figure 1. Exports of culpeo pelts from Argentina during the period 1976-1990 (from García Fernández, 1992)

The decline during the 1980's in culpeo harvest records in Neuquén probably results from a decrease in hunting-law enforcement. The total number of inspection visits to fur warehouses dropped from 382 in 1983 to 34 in 1987, and the number of violations detected dropped from 60 to 6 during the same years (Figure 2). The level of inspection visits was positively correlated with the culpeo legal harvest between 1983 and 1987 ( $r^2 = 0.834$ ;  $n = 5$ ). As enforcement declined, fewer local fur buyers requested permits or declared the numbers of pelts traded, thus avoiding taxation. This decline in law enforcement arose from an economic crisis that led to reductions in personnel and availability of vehicles and gasoline to patrol roads. Wildlife administrators in Neuquén agree in that the decline of the legal culpeo harvest, excluding that between 1979-80, merely represents an increase of illegal activities (A. del Valle, pers. comm.).



## Monitoring Densities

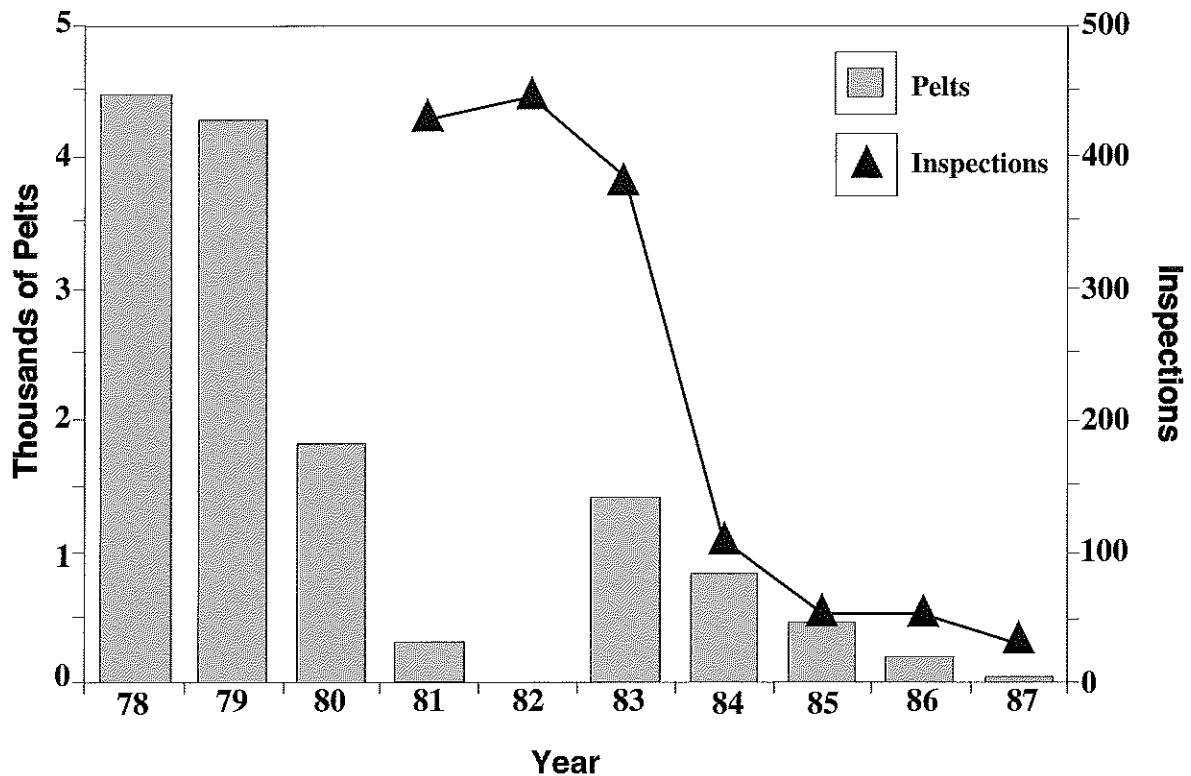
In 1989 I began monitoring densities of culpeos and other furbearers in southern C, in collaboration with the local wildlife agency (Novaro and Funes, in preparation). In the area sampled, culpeos are intensively harvested, both for their fur and to reduce sheep mortality. Between 20-50 culpeos are killed on each ranch annually. Six ranches (totalling c. 1,000 km<sup>2</sup>) were sampled each winter using scent-stations (Roughton and Sweeny, 1982). Despite the hunting pressure and the decline in their main prey, the hare (*Lepus capensis*), culpeo densities were stable during the last three years (Figure 3).

However, in Rio Negro Province, northern Patagonia, densities of culpeos have declined slightly (Von Thunghen and Bellati, 1987; J. Von Thunghen, pers. comm., 1991). In 1992 we initiated a monitoring programme of furbearer densities throughout Patagonia. This involves the continuation of the surveys in Neuquén and western Rio Negro and the sampling of six new areas in La Pampa, eastern Rio Negro, Chubut, Santa Cruz, and Tierra del Fuego Provinces and the Nahuel Huapi National Park on the

foothills of the Andes. Technical personnel from each provincial wildlife agency undertake these surveys, where scent stations are operated at the beginning of the hunting season and the numbers of culpeos and other furbearers hunted in the area are recorded.

Some other provinces in Patagonia have begun to monitor the harvest levels of foxes more efficiently, while helping local hunters increase their share in the fur trade. For instance, in 1988 the Rio Negro wildlife agency initiated a trading system in which furs are collected by local agricultural cooperatives. The wildlife agency then organizes an auction at which representatives of tanneries and exporters buy the furs directly, avoiding the many intermediaries that usually retain the majority of the benefits. Local hunters have thereby increased their benefits between three and eight fold, and the wildlife agencies are securing a more accurate estimate of hunting levels in the province. However, wildlife officials still believe that this system has absorbed only about 10% of the real fur market in the province (M. Alcalde, pers. comm., 1992). Through this system 7,973 pelts of *D. griseus* and 688 of culpeos were reported in 1988, 8,340 and 1,489 in 1989, 2,441 and 321 in

***"In Patagonia, more than 100,000 foxes (culpeos, Dusicyon culpaeus, and grey foxes, Dusicyon griseus) are hunted for their fur annually"***



**Figure 2.** Culpeos legally hunted and enforcement inspections in Neuquén Province, 1978-87



1990, and 621 and 170 in 1991 (Subsecretaría de Fauna, 1988, 1989, 1990, and 1991). According to M. Alcalde, the Rio Negro wildlife director, the decline in numbers has been the result of a decreasing demand and a continuous decline in the fur prices paid by wildlife traders.

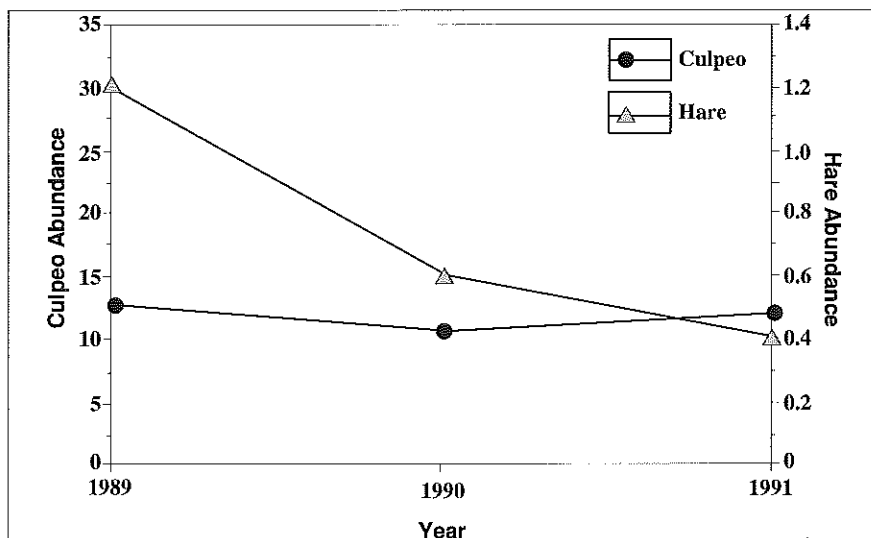
## Conclusions

In spite of the unknown but high current levels of hunting and predator control activities throughout continental Patagonia, both our data and that of wildlife managers indicate that culpeo densities have not experienced marked changes during the last few years. However, there is no information on the impact of hunting on the population structure, survival, and long term persistence of the species (Novaro, 1991).

On the other hand, culpeo populations are declining in Tierra del Fuego Province, despite the ban that has been in effect since 1985 (Fabbro and Loekemeyer, pers. comm., 1992). This decline could be the result of illegal hunting, which the reduced personnel of the local wildlife agency finds difficult to control.

In summary, harvesting of culpeos in some areas of Patagonia could be sustainable, but more information and improved control measures are needed. These will allow management agencies to develop plans for the sustainable use and the conservation of culpeos and other furbearing species in Argentina. I therefore conclude:

- 1) the regional monitoring programme that has been initiated should be continued, and expanded to other areas of Patagonia;
- 2) more information is needed about the impact of commercial hunting and predator control methods on the population dynamics of culpeos;
- 3) improved control systems should be implemented at the provincial and national level to promote the "legalization" of the fur trade, which will in turn provide more reliable statistics about harvesting levels;
- 4) efforts to modify the fur market through regional auctions should be supported, as they help the local economy as well as the monitoring of the harvest levels.



**Figure 3.** Abundance of culpeos (% scent stations visited) and hares (ind/ha) in Neuquén (Novaro & Funes, in prep.)

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**This article reports on a two month reconnaissance to India in 1991, subsequent travels in South East Asia, and an accompanying literature survey on the dhole. This is a first step to collating information on the current status of the dhole.**

## Introduction

The dhole or Asiatic wild dog, *Cuon alpinus*, is a pack hunter. Once widespread in late pleistocene Europe and Asia, India is its current stronghold, but it still might occur from the Ural mountains of Russia in the north, to Indonesia in the South. The 18 kg dhole stands about 50 cm at the shoulder and ranges from yellow to reddish in colour.

Much is unknown about the dhole. It has been the subject of only about 200 hours of direct observation by scientists in the field. The existing information, which owes much to Johnsingh's 1976-1978 field study in Bandipur and his 1985 census on the range of the dhole in south Asia, provides tantalizing hints of the fascination of this species.

## Scientific Interest

- 1) The dhole occupies an exceptional range of habitats, from the steppes of Siberia to Alpine regions of the Himalayas and the rainforests of Java (see Figure 1). This represents at least as great a range of habitats as the wolf or red fox.
- 2) The dhole takes a variety of prey: a single pack's diet may include species ranging from large solitary sambar *Cervus unicolor* (over twenty times a dog's weight) to the small black-naped hare *Lepus nigricollis*. The larger prey require coordinated attack, and often a "lead hunt dog" emerges by taking a prominent role in disabling the prey.
- 3) Inter-pack aggression between dholes appears to be very low. Fox (1984) suggests that neighbouring packs with recently shared genealogies may fuse and re-form for hunts and that the large packs of 30+ individuals observed by Burton (1940), Davidar (1975), Ramanathan (1982) and others are in fact "gatherings of the clan". Fox (1984) and Johnsingh (1982) suggest that the apparent superabundance of prey may allow for the dhole's relaxed territoriality. Some factor such as periodic epidemics is seen as keeping the dhole population below carrying capacity.

**Paul Stewart** is a graduate student in Oxford's WildCRU working on badgers. Previously, having worked as a TV producer on the BBC's Velvet Claw Carnivore series, he visited India on a Churchill travelling fellowship to gain experience of South and South East Asian wildlife reserves. Now he is coordinating the CSG's dhole survey.

- 4) Dens vary from large multi-chambered complexes occupied over many generations and simultaneously accommodating more than one whelping bitch, to simple scrapes below rocks where "satellite" females may give birth (a female whelped alone in a farmland drainage pipe some miles from Nagarhole Park just before I arrived there). Authors express conflicting opinions as to whether there is social suppression of female breeding (e.g. Fox 1984, Johnsingh 1982). Pack members appear to guard and regurgitate food to pups.
- 5) Packs are reported to have skewed sex ratios of 2:1 as adults (the ratio at birth is unknown).
- 6) The dhole has complex visual, vocal and olfactory communication behaviours (Cohen 1982, Johnsingh 1982), including unique additions to the usual lupine-like canid repertoire (e.g. the yak-yak vocalization and the agonistic mutual gape dance), as well as some surprising omissions (e.g. snarl display).

## Dholes in South Asian National Parks

The goal of this survey was to gain an impression of the dhole's abundance and the suitability of each site for a study on the dhole (in terms of logistical support and the park's infrastructure of roads and accommodation).

My information stems from informal discussions with park officials, biologists and guides. Care was taken not to lead the informants into exaggerating either the rarity or abundance of the dhole in their parks. I did however try to boost this dog's rather tarnished image in some parks. The subspecies considered is *C.a. dukhunensis* unless otherwise stated.

### PERIYAR RESERVE

**Site:** 777 sq km; Kerala State, South India.

**Habitat:** The sanctuary is dominated by a lake surrounded by rolling or steep hills with large areas of grassland between patches of deciduous forest. There are some areas of dense tropical evergreen forest.

**Status of the Dhole:** Dholes are commonly seen in the reserve hunting on the banks of the lake, and were observed on five of the seven days I spent at the reserve. The field director of project Tiger for the reserve estimated 50 packs in the reserve based on mammal census sightings made from the main lake.

This is probably a generous estimate. Two park biologists are planning to begin a survey of predator-prey relations in Periyar. The dhole is probably the park's most important large predator and is seen as being the key species in the survey. Periyar was the site of Naresh Bedi's film "The Whistling Hunters" (BBC Wildlife on One 1989).



### NAGARHOLE, BANDIPUR & MUDUMALAI

**Site:** Nagarhole: 640 sq km, Bandipur: 865 sq km; Karnataka State, South India. Mudumalai: 300 sq km; Tamil Nadu State, South India.

**Habitat:** Three independently administered but adjoining parks. Mudumalai is the furthest south and encompasses a hill range with quite open habitats including grassland. Bandipur has grassy woodland and dry deciduous forest. Nagarhole is the furthest north with higher rainfall and consequently denser moist forest than its sister parks.

**Status of the Dhole:** I was unable to visit Mudumalai or Bandipur. The dhole is still quite common in Bandipur at least. Johnsingh (1982) reports a "core area" of 20 sq km for the 5-11 member pack he studied in Bandipur. I visited the Karapura region of Nagarhole (approx. 100 sq km near the northern border of Bandipur). Only two packs, each of approximately six individuals, were regularly in evidence. In 1989 a third pack which had shared

***"Officials in every park were under the impression that the dhole was common, but not in their own park"***

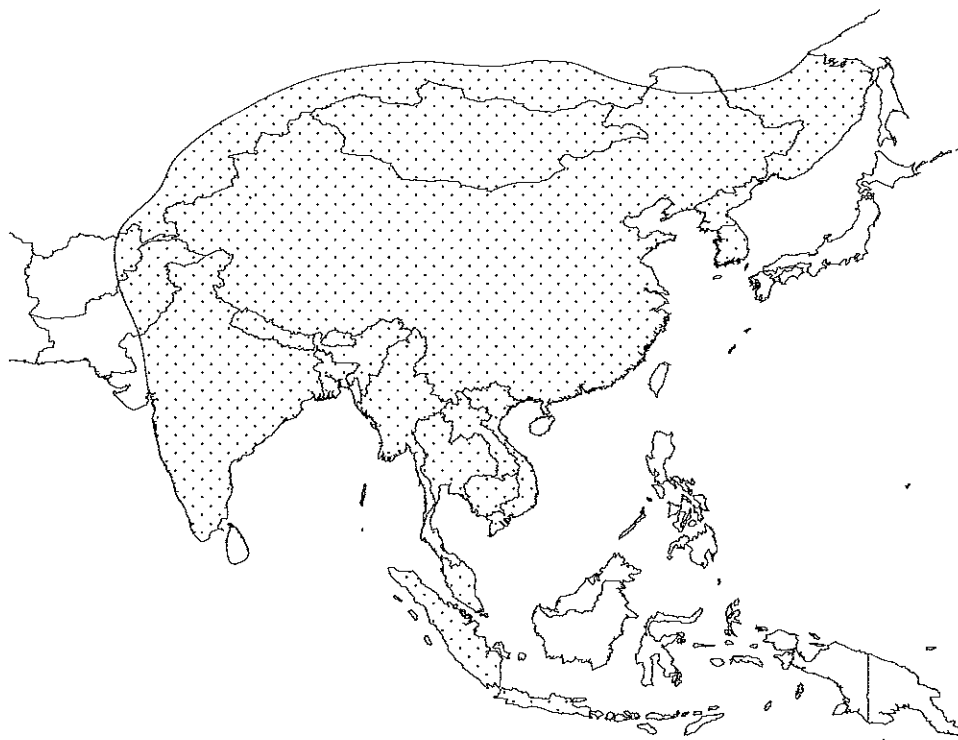
the area for several years disappeared, perhaps due to an apparent outbreak of mange. Park wardens believed the dhole to be less abundant in Nagarhole than Bandipur or Mudumalai. Logistically these parks are good with motivated staff, good accommodation, and an extensive road network. In March 1991 local annoyance with Nagarhole officials resulted in widescale burning of forest and a research facility.

### KANHA NATIONAL PARK

**Site:** 940 sq km; Madhya Pradesh State, Central India.

**Habitat:** This park is surrounded by hills with extensive grassland plateaux and some dense mixed deciduous forest on the steeper slopes. The lower valleys have large meadows with scattered stands of trees. Cold winters (and occasional frosts), with hot summers.

**Status of the Dhole:** Periodic and unexplained population crashes characterize the dhole in this part of India; during the late 1960's no dholes were found in the park. Current opinion estimates ten to fifteen packs averaging six individuals in Kanha. Given the huge herds of deer in this park, this is a surprisingly low number. Several park officials considered the dhole "vermin" – an unwanted predator on the rare Barasingha deer *Cervus duvauceli*.



**Figure 1.** Former range of the dhole, *Cuon alpinus* in Asia



### BANDHAVGARH

**Site:** 450 sq km; Madhya Pradesh State, Central India.

**Habitat:** Undulating terrain with mixed forests and bamboo brakes.

There is open grassland to the south. It has cold winters and the park is closed in the monsoon.

**Status of the Dhole:** One pack occupies the central area of the park, a situation that does not appear to have changed in the last five years. Tigers are unusually abundant and visible in the reserve and may compete aggressively with the dhole.

The dhole is not seen as an important member of the park's mammal community, the focus of attention going as ever to the tiger. The infrastructure of the park is good.

### CHITWAN

**Site:** 967 sq km; Southern Nepal.

**Habitat:** Mostly Sal forest with riverine forest and grasslands. Hot summers and cold winters.

**Status of the Dhole:** Though the habitat appears ideal, the dhole is, at best, very rare in Chitwan. I met no one in the park who had seen one. I walked the long axis of the park and found no sign or spoor of dhole. Some guides had no memory of the dhole in the park during ten years of guiding. The subspecies (*C. alpinus primaevus*) is expected there. The dhole was more widespread in the park during the 1970s.

## South East Asia

### TAMAN NEGARA

**Site:** 4343 sq km; Central west Malaysia.

**Habitat:** Humid tropical rainforest. Some hilly upland regions with marginally more open habitats.

**Status of the Dhole:** The only possible sighting of the dhole

was of two golden dogs in the centre of the park two years ago. Possibly they were members of a peninsular dingo population, (*Canis familiaris dingo*). No park officials were capable of identifying spoor of the dhole, and I found none in two weeks in the park. There seems to be no reliable record of any other recent sightings of the dhole in other Malaysian parks.

### BURMA

(Information from India)

**"I saw tigers more often than dhole in India"**

The status of the dhole (Subspecies *C. a. adjustus* and *C. a. infuscus*) is poorly known in Burma. Parks such as Maynyo and Shwe-U-Daung held good populations in largely forested areas up to the late 1960's, but what remains of the forest or the dholes is not known.

### LADAKH

(Information from India)

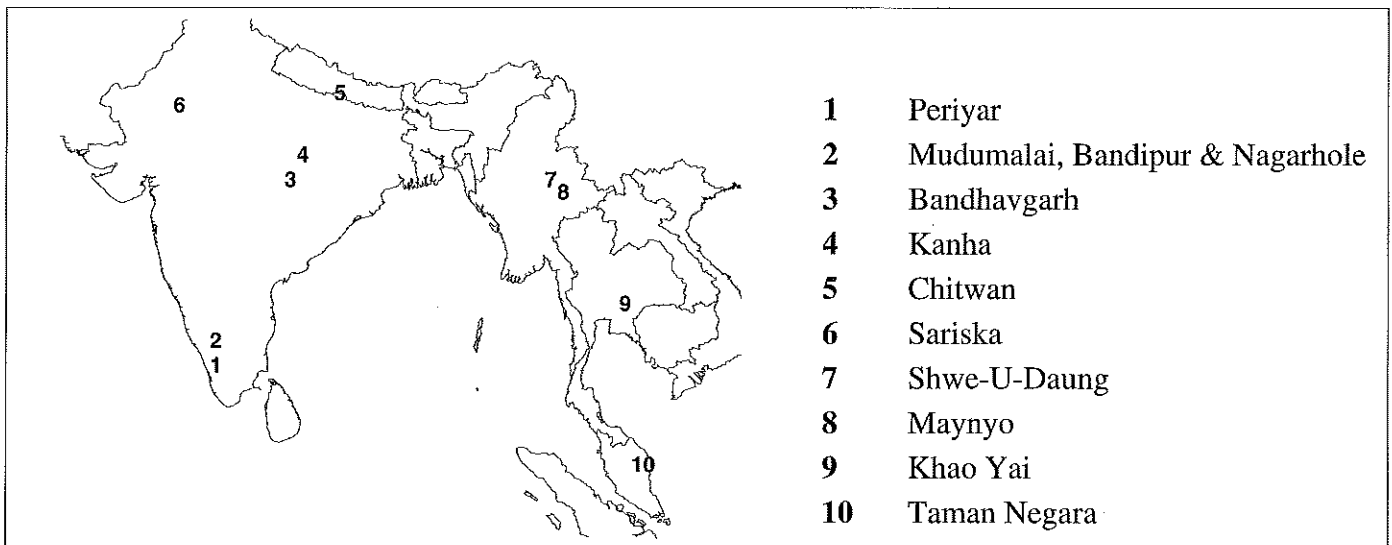
Naresh Bedi filmed dholes in Ladakh in 1991. This is probably the subspecies *C. a. laniger*. They are generally rare in Ladakh.

### THAILAND

Although the dhole is still supposed to inhabit such Thai parks as Khao Yai, I met nobody in the parks who had either seen or heard of them in Thailand. They might be expected to be commoner in the hills near the Burmese border which I did not visit. Ornithologists working in these border areas had not seen dhole (the expected subspecies is *C. a. infuscus*).

## Conclusion

Of the parks visited, Periyar seemed to have the best and most visible population of dhole. The park staff there are



**Figure 2.** National Parks and Reserves discussed in the article



very helpful and there is good accommodation deep in the park, including a watchtower over favourite hunting grounds at Than-nikudi. If Burma's visiting restrictions relaxed, perhaps its forests will emerge as the best remaining sites to study dholes. Observations of the dog on Ladakh's cool and often treeless plains would be a fascinating parallel to any study in the more closed habitats of South and South East Asia.

In general the prospects for the dhole seemed rather depressing, especially for subspecies found outside India. More information from all parts of the dhole's range is necessary; observations from Russia, China and Indonesia where there are no recent records should be a priority.

I saw tigers more often than dhole in India. The dhole could hardly be described as abundant even in the best parks such as Periyar. Officials in every park were under the impression that the dhole was common, but not in their own park. Dholes are reported from some reserves in the Central Indian Highlands and Southern states which I was not able to visit. Most of these parks are becoming progressively more isolated by cultivated land. Parks such as Chitawan and Kanha indicate that dholes suffer population crashes encompassing even the largest parks, and that recolonization and recovery is slow. Outside the parks, forest is very degraded, and the future for any animal which depends on it seems grim indeed.

On the positive side dholes may be more resilient than they seem. Sariska is a park surrounded for hundreds of square kilometres on all sides by intensively settled and farmed land. Dholes had not been seen there for over twenty years, when suddenly in 1986 three arrived in the park, hunted for a while and then disappeared. Where they came from or went is a mystery. That they could have survived in a seemingly healthy state across such vast tracts of disturbed terrain is remarkable. A sign, at least, that as long as we give the dhole half a chance, this adaptable dog will find a way to survive.



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The Canid Specialist Group is currently trying to assess the status of the dhole, particularly in countries outside India. If anyone has any information, or can suggest possible contacts who could help us we would be glad to hear from them.

Contact:

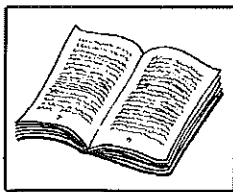
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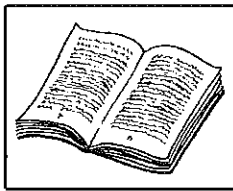




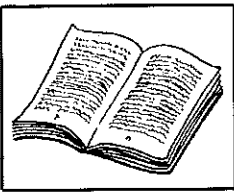
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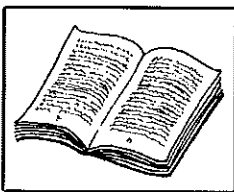
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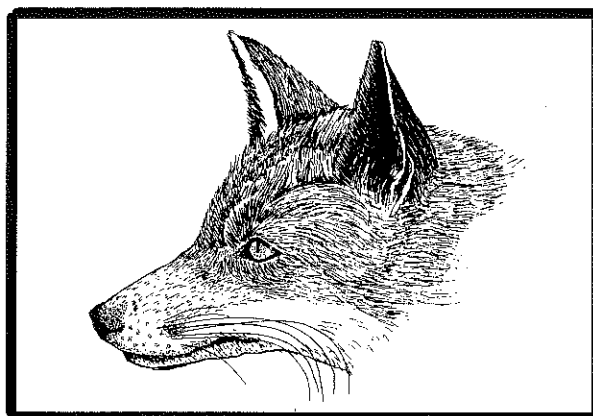
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