PAINTED DOG CONSERVATION

RESEARCH ANNUAL REPORT FOR THE YEAR 2019

SUMMARY

The Zimbabwe national pack may be regarded as a keystone of importance to the maintenance of dog populations in Southern Africa. Zimbabwe remains as a key painted dog stronghold with about seven hundred dogs, however the ranging abilities of the species, makes the effectiveness of wildlife protected areas to protect the animals, suspect, due to packs leaving the sanctuary and falling victim to being run over by vehicles, snares and diseases.

PDC research has shown over the years the evolution of threats to painted dogs, road kills, snares and diseases, take a heavy toll on packs foraging beyond the protected areas and thus negatively impact on the protected populations.

Painted-dog Conservation (PDC) values the importance of species conservation management, through research and monitoring as painted dogs are indicator species within the ecosystem. Their presence and density acts as an overall indicator of conservation status of wildlife areas. Successful painted dog conservation is beneficial to ecosystem conservation, as it results in the preservation of numerous species and natural processes in the wildlife areas, being protected. Painted dog Conservation has been using the species as an umbrella for wildlife conservation for the past twenty years'

Painted dogs in the country are listed as endangered and the population had been declining, however, Hwange National Park (HNP) has recorded a slight recovery in painted dog population since 2016, brought about by more pups in breeding units, more pups surviving to adulthood, being linked to plenty rainfall and prey species, thus healthier alpha females. (Creel and Creel 1996; Mills and Gorman 1997) The Gwayi areas in Hwange are still considered a sink habitat for dogs and herbivory, and other farmlands bordering HNP. The wide ranging of dogs, means that some packs spend some time in human induced areas beyond the safe confines of protected areas.

The Mcdonald's pack, Mpindo pack, Kali pack, Django pack range beyond HNP and have resulted in mortality and injuries, during the reporting period, as a result of anthropogenic induced factors.

There is a growing concern surrounding the disturbance of painted dogs in Mana pools. While the painted dogs are a "must see" for many visitors, which translates as a big plus for the species in Mana pools, this enthusiasm needs to be carefully managed and monitored closely. Painted dogs have an intrinsic ecological benefit and do have a massive tourist potential, which has a financial value if managed well.

The Den sites for the painted dogs in Mana pools are visited often by operators with clients and some tourists without walking permits. While there is little evidence that this causes any

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significant harm, there are recorded incidents of packs moving their den apparently due to disturbance. The real reason for the move and its timing is unknown. It is noted that painted dogs do indeed move their den 2 or 3 times at least, generally if the site becomes too smelly and thus likely to attract more attention from predators such as hyena, lion and leopard.

Crowding of the painted dogs while resting and being closely followed on foot is also a growing concern in Mana pools. Again, the enthusiasm to see the painted dogs is welcome but needs to be managed by the Wildlife Authorities.

The painted dog population, in the PDC core research area of HNP, based on data available, **total count of all known packs for the period January 2019 to December 2019, is 168 dogs in 22 packs.** PDC believes there could be more pups not yet accounted for as PDC was denied access to undertake research for long periods and this has affected search effort and data collection.

This makes estimated (extrapolated) population for HNP to be +/- 193 adults in 32 packs at an average of 6 adult dogs per pack, excluding 24 pups.

The population for Mana pools and the Mid Zambezi valley was monitored for the course of the whole year with 103 dogs and 48 for Mana pools only. **Making at total of known packs to be 151 adults in 17 packs at an average of 11.26**

Extrapolations these figures gives an estimate for the entire Mid Zambezi valley including Mana pools at 229 adults in 24 packs.

Permission during the years was given by ZPWMA to collar five separate dogs in HNP and two in Mana pools, they are being monitored in their movements.

Sighting questionnaire forms were distributed throughout the HNP and all safari camps/lodges, to broaden wild-dog sighting data in all areas and photographs were requested from tourist whenever available to identify the individual dogs in the packs. These pictures significantly improve dog identification, as each dog has unique markings.

An analysis of dog scats from Mana pools indicates to a high preference for baboons which has never been recorded or observed in Hwange National Park and is being investigated through monitoring and research. An analysis of painted dogs scats during the year from packs indicates to prey preference of dogs in HNP ecosystem for kudu and impala in larger packs (>5 adults) and duiker in smaller packs (<5 adults). **Thus, lending support towards the argument for a moratorium on hunting Kudu and Impala if the painted dog population is to thrive.**

The road counts were conducted in collaboration with ZPWMA, CIRAD/CNRS and PDC to monitor and understand seasonal habitat preference and use in relation to spatial distribution for the herbivores, with emphasis on key dog prey species. The monitoring and analysis is aimed at assessing prey trends and abundance over a given period. Final results for road counts indicate a stable trend for all herbivores.

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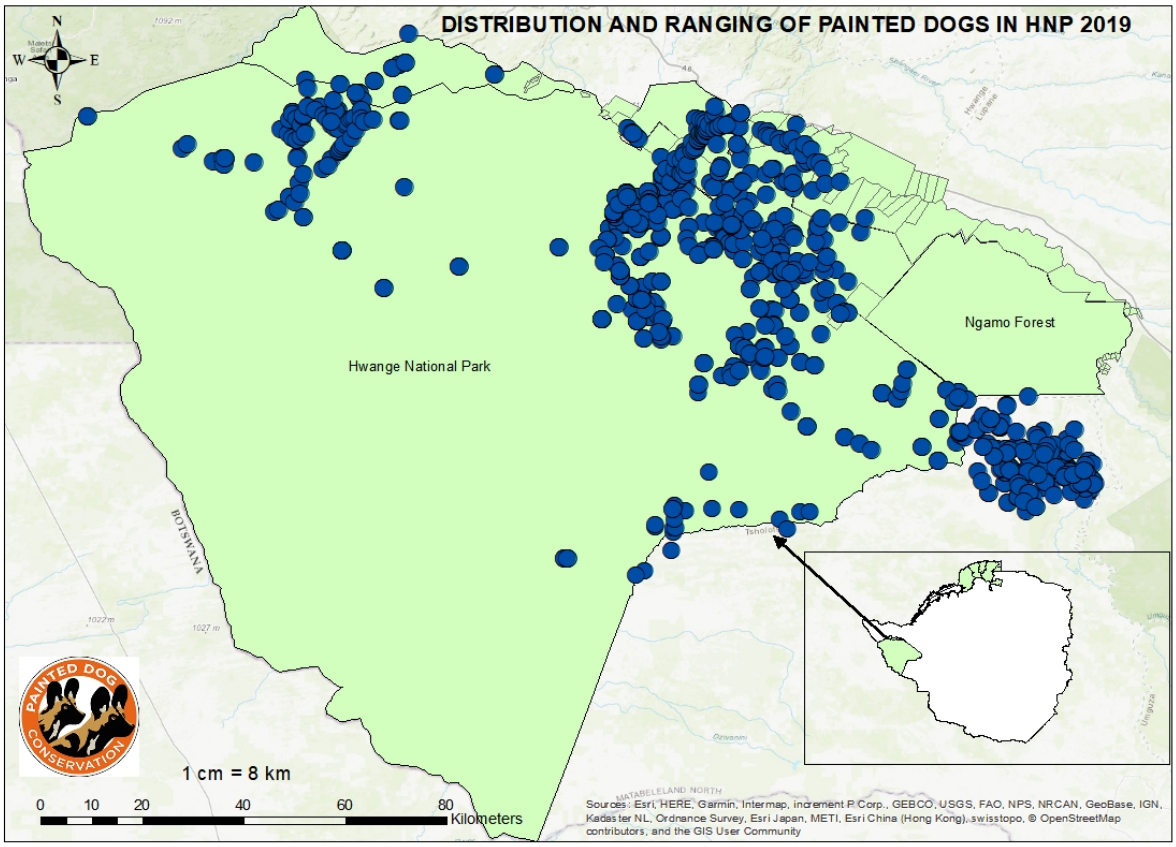
PAINTED DOG POPULATION RESULTS FOR HWANGE NATIONAL PARK (HNP)



Map 1-DOG DISTRIBUTION AND RANGING FOR HNP - 2019

Data on the HNP population demographics is collated from direct sightings, photographs and sighting sheets. Each dog has a unique coat pattern and thus photographs or video footage are the most valuable tool in determining pack and pack structures (number of adult males, females, yearlings and pups) and distinguishing 1 pack/individual from another. Pup survivorship is a key element that is recorded as photo capture/recapture method of recording the individuals seen each time a pack is encountered and this is entered on data capture sheets. Painted dog monitoring was undertaken through ground-based tracking of the VHF/GPS collared packs, combined with opportunistic observations of uncollared packs. Population parameters were derived from data collected during the course of the year. Pack size is estimates as a number of adults and yearlings in each pack, preceding breeding.

Data used in this report is based primarily on sightings recorded and received in the period January to November 2019. The Destiny pack failed to raise any pups due to hyenas and lion predation and this reinforces the threat to survivorship of dogs by large carnivores. See table 3

The average adult per pack for 2019 is 7.6 see table 1 below

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Table 1: Demographic overview of HNP dogs seen in 2019.

PACK NAME	Total Number of Dogs	Total AD	AD M	AD F	Pups	Last seen
Jozi	21	21	14	7	0	Aug-19
Nantwich	5	5	3	2	0	Sep-19
Gurangwenya	13	13	7	6	6	Nov-19
Somalisa	7	7	5	2	0	Nov-19
Mtoa	12	12	7	5	6	Nov-19
Sinamatella	3	3	2	1	0	Jan-19
Somamalisa	5	3	3	2	0	Mar-19
Tshakagwenya	2	2	1	1	0	Mar-19
Botswana	5	5	1	4	0	Jun-19
Mcdonald	2	2	1	1	0	Aug-19
Brokenrifle	5	5	3	2	0	Aug-19
Mandavu	15	10	6	4	5	Oct-19
Kashawe	6	6	4	2	0	Oct-19
Matshayitambo	7	3	2	1	4	Nov-19
Bathathu	2	2	1	1	0	Nov-19
Spectrum	3	3	2	1	0	Nov-19
Ngweshla	9	3	2	1	6	Nov-19
Kennedy	6	6	4	2	0	Nov-19
Django	3	3	1	2	0	Nov-19
Destiny	2	2	1	1	0	Nov-19
Lukodet	20	11	6	5	9	Nov-19
Tshakabika	15	15	9	6	8	Nov-19
TOTAL	**168**	**142**	**85**	**59**	**44**	
Number of packs	**22**					
Pack size	**7.6**					

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Fluctuations in population size at local scale HNP

Populations of painted dogs ae prone to marked fluctuations at a variety of temporal and geographic scales. At local scale, a combination of high mortality, high fecundity, and dispersal by both sexes means that pack size fluctuates substantially over short periods. It is for these reasons that total dog numbers for each year differ. Because painted dogs are seasonal breeders, fluctuations may be synchronized across packs. These demographic characteristics lead to fluctuations at population scale. With painted dogs local extinctions are uncommon, under good condition dog populations are able to grow quickly. It is a known fact that dogs have capacity for long range dispersal, means sub-populations/packs reappear unexpectedly and grow rapidly. There are unknown dispersers in Hwange that have appeared from nowhere.

Several large packs were not observed during the year, however, dogs have surfaced after several years without being seen, the HNP is big and challenging to monitor packs as less than a third of the park has roads. See table 2 below.

Table 2: Demographic overview HNP dogs known but not seen in 2019

PACK NAME	Total Number of Dogs	Total AD	AD M	AD F	Pups	Last seen
Robins	4	4	2	2	0	Apr-2017
Shanu	5	5	4	1	0	Jun-2018
Lodzi	3	3	1	2	0	Oct-2018
Kapula	3	3	2	1	0	Nov-2018
Wexau	6	6	5	1	0	Nov-2018
Shumba	4	4	2	2	0	Dec-2018
TOTAL	**25**	**25**	**16**	**9**	**0**	
Number of packs	**6**					

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Reference is also given to historical sightings and records, while whole packs/individuals may not have been seen in 2019, it is unlikely that these dogs or packs no longer exist. The size of the research area and the distribution of access roads makes it difficult to have full coverage of the park, a survey would partially indicate only occurrence of the dogs.

If an individual dog is not seen/recorded for a period of 2 years, the dog is marked as missing only and chances are the dog is still alive. The monitoring in the HNP constitutes only about a 1/3 of the park, much of the park is inaccessible to vehicles, being largely roadless and covered with vegetation, hilly and rocky to the north, and the substrate being soft Kalahari sands. Hence painted dogs are difficult to observe and impossible to follow for any distance.

Table 3: Mortalities recorded in 2019 in the HNP

NAME OF DOG	DATE OF DEATH	NAME OF PACK	CAUSE OF DEATH
Erwin	17/01/2019	Mpindo	Unknown went missing
Unnamed	11/02/2019	Mpindo	Unknown went missing
Pin	18/02/2019	Lukodet	Killed by a snare wire within the Sinamatella area
Beetle	12/03/2019	Somamalisa	Unknown went missing and found collar only
Lux	18/03/2019	Kali	Unknown went missing
Mack	11/04/2019	Kali	RTA
Unnamed	22/05/2019	Mcdonald's	Paralyzed back legs put down
Matabi	21/07/2019	Mcdonald's	Intraguild killing
Silke	06/08/2019	Mcdonald's	Killed by a snare wire within the Chimwara area
Fran	25/08/2019	Mcdonald's	Killed by a snare wire within the Dete Valley 3
Sully	25/08/2019	Mcdonald's	Killed by a snare wire within the Dete Valley 3
Mantswane	25/08/2019	Mcdonald's	Killed by a snare wire within the

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			Dete Valley 3
Browny	14/09/2019	Destiny	Natural death
Unnamed	31/10/2019	Matshayitambo	Uncertain waiting for blood results
Unnamed	31/10/2019	Matshayitambo	Uncertain waiting for blood results
Unnamed	01/11/2019	Matshayitambo	Uncertain waiting for blood results

Until 2015, road kills were the major causes of mortality, however for the past 3 years snares have emerged as the greatest threat to painted dogs followed by disease (canine distemper and Rabies). The Macdonald's pack faced adversities during the course of the reporting period as they were caught in snares and de-snared several times in Gwayi.

2019 is considered at PDC as a terrible year in terms of dog mortalities.

- All pups of the Mcdonald's pack were killed by an unknown animal or poachers in the forestry area near Mabale.
- Fran the Alpha female of the Mcdonald's pack was snared and killed at Dete valley 3 in Gwayi.
- Matabi of Mcdonald's pack was killed by lions near Safari lodge.
- Three adults Mcdonald's pack members were tragically snared on the same day with Fran on the same spot in Dete valley 3, Gwayi.
- Pin of Lukodet pack was snared and killed in the Sinamatella area
- Seven adult dogs out of ten of the Matshayitambo pack of Jozibanini died of suspected distemper.

It is apparent that regular PDC daily poaching patrols deter poaching and are effective in protecting wildlife and painted dogs. Thousands of snares are taken out every year in wildlife areas by these patrols. However, the continued lack of similar effort from stakeholders, particularly in the Gwayi remains a real cause for concern and contributes to significant population declines across multiple species.

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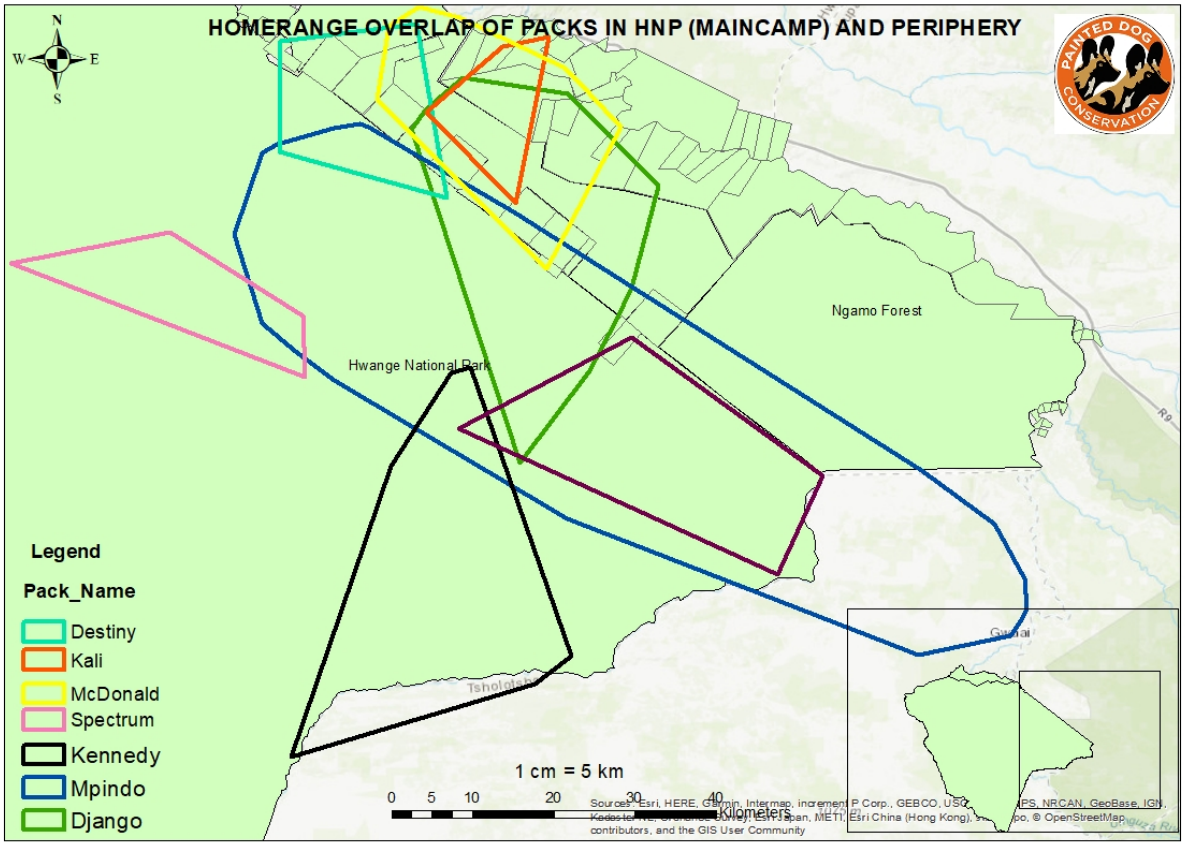

Map 3-HOME RANGE OVERLAP OF PACKS IN HNP AND PERIPHERY

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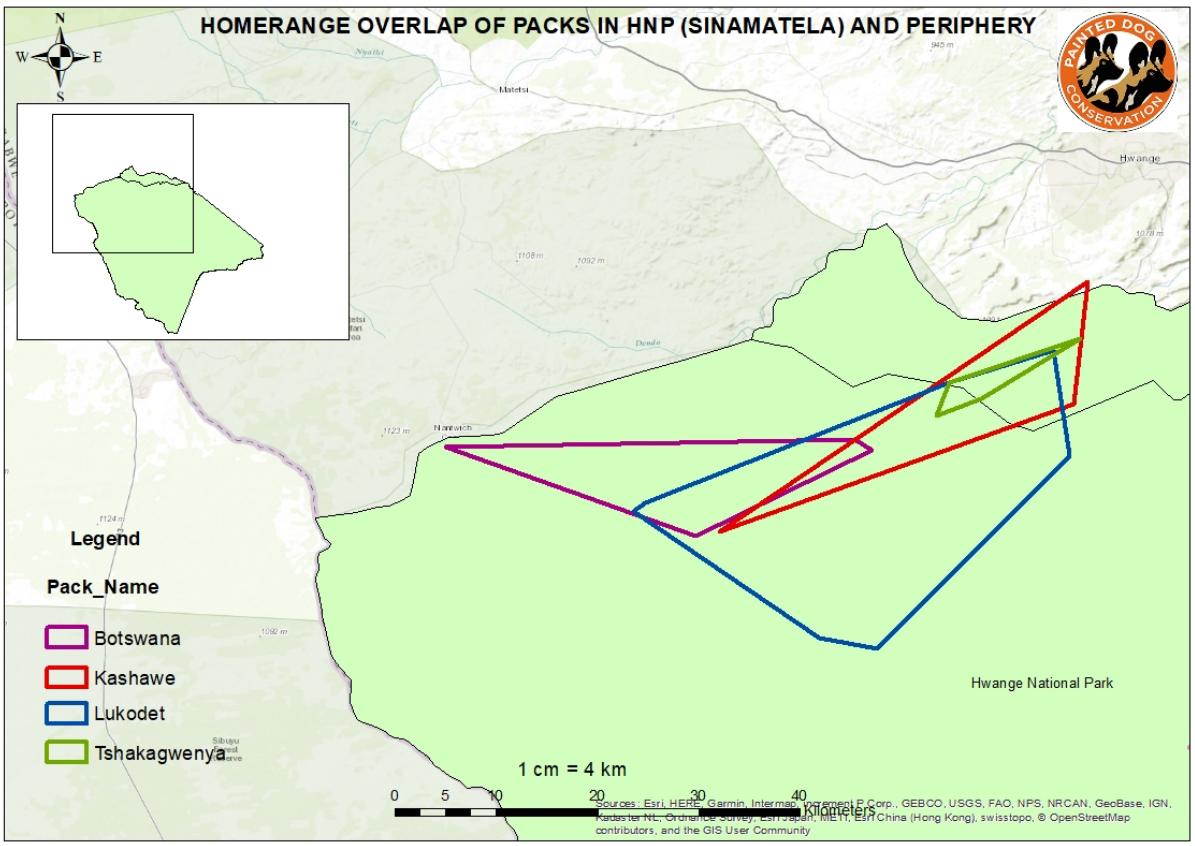

Map 4-HOMERANGE OVERLAP OF PACKS IN SINAMATELLA AND PERIPHERY

Home range sizes are measured by the restrictive polygon method (Mills 1990), where the length of any side of the polygon enclosing the radio locations is restricted to the mean distance between fixes and the arithmetic mean centre (i.e the mean of x and y co-ordinates). Habitat selection for dogs is measured at 2 levels, at landscape level, where habitat selection is measured for all known packs for HNP and individual habitat selection by each pack, the habitat preference for dogs and their prey is measured through compositional analysis and index of preference. Territory size of dogs highly differs and is mostly determined by the dispersion of food patches, densities of lion and hyenas and other factors, see map 3 and 4 above.

Inadequate land management practises in the Gwayi and Forestry contribute enormously to the loss of painted dogs and prey and the Gwayi has remained a critical source of sink for years. See map 3. Currently only 1 pack is ranging in the area as compared to 3 packs last year that utilized the Conservancy at its peak. The Kali and Mcdonald's packs that ranged in the Gwayi ,and have lost between them 9 dogs in 2019.

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Table 4: DOGS COLLARED IN 2019

PACK NAME	DOG NAME	TYPE OF COLLAR	DATE COLLARED
Kennedy	Simon	VHF	18/2/2019
Destiny	Lily	VHF	12/4/2019
Mcdonald	Matthew	VHF	13/4/2019
Kennedy	Aubrey	GPS	2/9/2019
Django	Gemma	GPS	12/10/2019

Hair analysis of prey species in dog scat

Diet and preference of painted dogs was also investigated through scat analysis and opportunistic observations of kills. Painted dog scats/faeces were collected opportunistically during the course of monitoring and were distinguished from those produced by other species on the basis of appearance and distinctive smell. Observers recorded the location of scats and named the packs where possible. Prey species were identified by comparing appearance of hairs, hooves, bones, and even teeth found on the faeces.

The prey hair analysis objective is to collect prey data to establish the extend of the predatory role of *Lycaon pictus* and its impact on the ecology of the HNP ecosystem and provide informed recommendations to Parks Management on sport hunting and ration usage.
During the course of the year, faecal samples were analysed, table 5, for hairs from prey species, the dogs, form different packs consumed in HNP. The hair samples were taken from several parts of the body, specifically the neck area, tail, thig, and shoulder. Plucking on different parts of the animal was done to see ii the patterns were hair changed with location on the body and were compared with a hair reference data base compiled from the Bulawayo Museum.

Both the scale and cross pattern and cross section of the prey hairs was used to determine which species the different pack consumed within the HNP ecosystem and Mana pools. Results were analysed and compiled, the most preyed upon species as with records, was kudu for the HNP, followed by impala and bushbuck.

The importance of kudu and impala in the diet of dogs, re-enforces the argument and recommendations by PDC for the reductions or alternative species for management quotas for Parks and the Gwayi Area.

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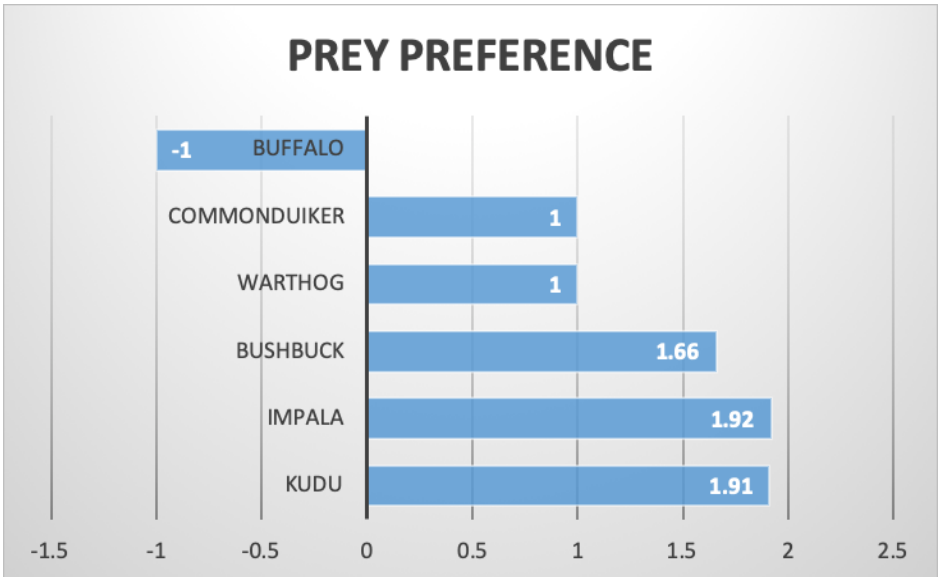
Table 5A-HNP Painted dog diet analysis results by species

Species	Total Kills (r)	Abundance (p)	Jacob's Index D=r-p / r+p-2(r)(p)	Prey Preference (+1)	Prey Avoidance (-1)
Kudu	7	0.269	1.91	+1	-
Impala	11	0.423	1.92	+1	-
Bushbuck	6	0.230	1.66	+1	-
Warthog	1	0.038	1	+1	-
Common-duiker	1	0.038	1	+1	-
Buffalo	0	0.002	-1	-	-1

Table 5b-HNP Painted dog diet analysis results by species



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HERBIVORE POPULATION TREND MONITORING

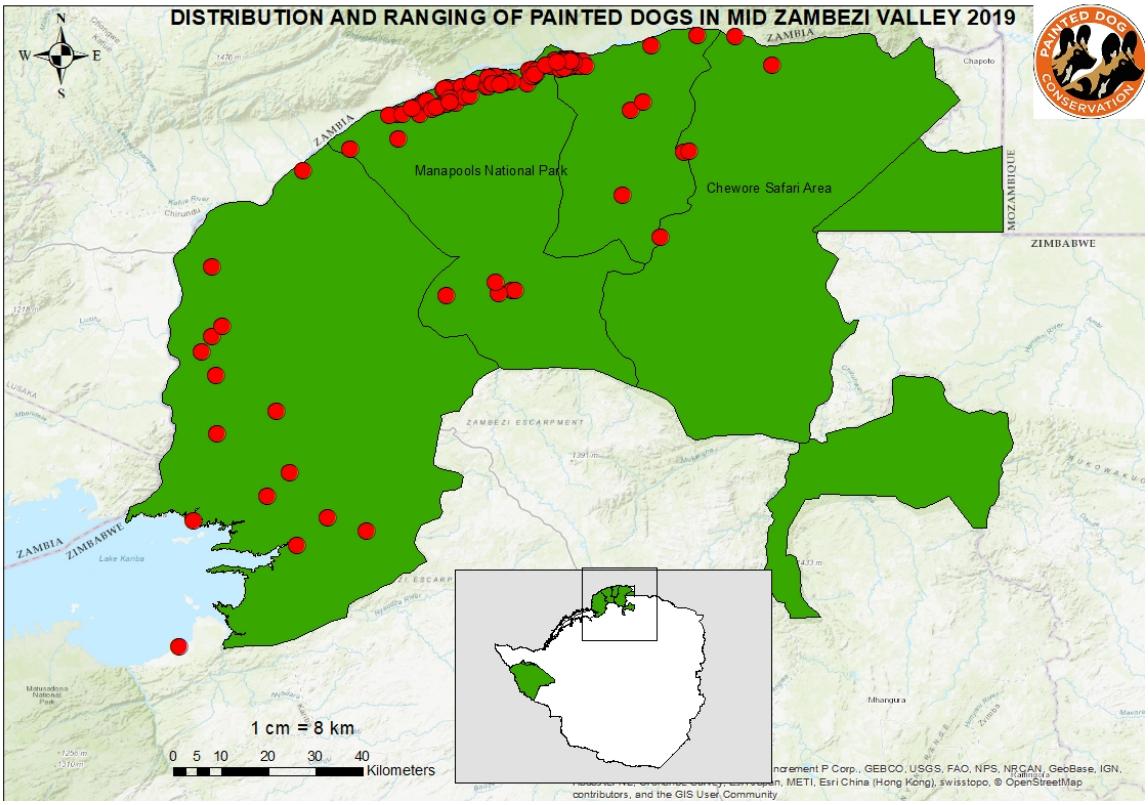
PDC participated and provided logistical support to the yearly PDC, ZPWMA,CNRS,CIRAD road counts in HNP. The objective of this monitoring and analysis is prey densities, trends and abundance over given period.

Road counts

Road counts were carried out in May and October in the Main camp area, Sinamatella and Robins camp. The most available roads were used as transects. Each transect was driven at least twice at different times of the day. The road count was followed by line transect method where perpendicular distances are calculated by using the angle and the direct distance between the animal and vehicle at first detection. Although the use of road transects has been under debate (Buckland et al…….2001) it is often the only way to estimate densities over large areas and odes allow for comparisons between sides and years. Data analysed, indicates stable densities for most species and data for 2019 is yet to be analysed.

PAINTED DOG POPULATION RESULTS FOR MANA POOLS and MID ZAMBEZI VALLEY

Map 1b- shows the distribution of painted dogs in Mana pools during the current year only.



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Mana pools and the Mid Zambezi valley was monitored for the course of the whole year with 103 dogs for 2019 and 48 for Mana pools only. **Making at total of known packs to be 151 adults in 17 packs at an average of 11.26**

Extrapolation of these figures gives an estimate for the entire Mid Zambezi valley including Mana pools at 229 adults in 24 packs.

Table 6: population estimate for painted dogs in Mana pools.

PACK NAME	TOTAL NUMBER OF DOGS	TOTAL ADULTS	ADULT MALES	ADULT FEMALES	PUPS	LAST SEEN
Nyakasanga	12	10	4	6	2	Nov-19
Nyamatusi	3	3	3	0	0	Nov-19
Ruckomechi	4	4	3	1	0	Nov-19
Chitake	5	5	4	1	0	Jun-19
Cheruwe	4	4	7	2	0	Nov-19
Kavinga	8	7	5	2	1	May-19
Kanga	6	6	5	1	0	Nov-19
Four sisters	4	4	0	4	0	Nov-19
Sapi	2	2	1	1	0	May-19
TOTAL	**48**	**45**	**32**	**18**	**3**	
Number of packs	**9**					
Average dogs per pack/pack size	**5,33**					

Table 6a-population estimate for painted dogs in specific areas of the Zambezi Valley.

Charara

Pack Name	TOTAL NUMBER OF DOGS	TOTAL ADULTS	ADULT MALES	ADULT FEMALES	PUPS	LAST SEEN

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Charara	7	7	-	-	0	August 2018
Nyaodza	15	15	-	-	0	

Sapi

Pack Name	TOTAL NUMBER OF DOGS	TOTAL ADULTS	ADULT MALES	ADULT FEMALES	PUPS	LAST SEEN
Mtavatava	6	6	-	-	0	August 2019

Kapirinhengo

Pack Name	TOTAL NUMBER OF DOGS	TOTAL ADULTS	ADULT MALES	ADULT FEMALES	PUPS	LAST SEEN
Chewore	7	7	-	-	0	May 2019
Kachowe	30	30	-	-	-	August 2019

Mkanga/Dande

Pack Name	TOTAL NUMBER OF DOGS	TOTAL ADULTS	ADULT MALES	ADULT FEMALES	PUPS	LAST SEEN
Man-Angwa	22	18	-	-	4	July 2019
Mkanga	8	8	-	-	0	July 2019

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Doma

Pack Name	TOTAL NUMBER OF DOGS	TOTAL ADULTS	ADULT MALES	ADULT FEMALES	PUPS	LAST SEEN
Doma	8	8	-	-	0	July 2019

From the current reporting period prey records of ungulates, with a particular effort to evaluate prey preference was recorded and unlike packs at HNP, the Man pools dogs have a preference for baboons, impala, kudu and eland. Statistics from HNP indicate a greater % of impala and kudu, the significance of this will be a comparison of prey preference by packs being under taken at an MSc level. However, the above facts are deemed commensurate with the fact that kudu show a preference for woodlands and thickets. The above view reinforces the view that dogs will take prey species in proportion to their relative abundance with no selective targeting for their main prey species.

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Additional activities and summary of support to Parks

- PDC provided support to HNP Maincamp/Mana pools and Sinamatella in terms of fuel and vehicle use and man power for Anti-poaching operations. PDC assisted with **1270litres** of fuel during the current reporting period for various purposes.
- PDC paid **USD $4400.00** for informant payments in cases involving wildlife crime.

- PDC paid **USD $1950.00** for fuel procurement at Mana pools.

- PDC contributed **USD $2500** towards the DG tornament.

- PDC donors and supporters paid **USD $14000.00** as Park Entry fees for the year.

- PDC donors and visitors paid over **USD $ 11800.00** As accommodation fees at Parks/lodges/hotels in Hwange /Mana/Vic falls during the period, contributing positively in growing the local economy plus the downstream benefits.

- PDC paid over **USD $5000.00** as aircraft charter fees for the translocation of the Mpindo pack from Hwange to Mana pools.

- PDC paid over **USD $15,960.00** for buying cattle, goats and rabbits to feed Mpindo pack while in bomas.

- PDC has provided man power support to Sinamatella twice a month every month for the whole year for Ant-poaching and de-snaring operations.

- Genetic profiling is ongoing with Stanford University and PDC.

- Development of image recognition software for coat pattern identification of individual painted dogs is on going with Notra Dame University

- PDC runs its own Anti-poaching Units that patrol the buffer zones around HNP.

- PDC provides material support and hotline between Parks and the community in cases of poaching and human wildlife conflict.

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- PDC conducted a series of community based meetings to tackle snaring and poaching in conjunction with ZPWMA.

- PDC conducted a domestic dog vaccination programme, adjacent to HNP. Vaccination of over **1700** domestic dogs against Rabies and Distemper.

- PDC undertakes a weekly clean up campaign at Mabale and Dete on behalf of the community.

PDC provides learning experiences through an internship for Zimbabwean students and offered five internship opportunities listed below for this period

➤ **Nkazimulo Lima**- National University of Science and Technology- Forest Resources and Wildlife Management

➤ **Yolanda Mutinhima**- Chinhoyi University of Technology- Wildlife Ecology and Conservation

➤ **Anele Bukhosi Sibanda**- Lupane State University- Geography and Population studies

➤ **Maxwell Muchina**-National University of Science and Technology- Forest Resources and Wildlife Management

➤ **Joylene Sibanda**-Don Bosco Technical College -Wildlife Management

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