The George Adamson Wildlife Preservation Trusts, through their Field Director Tony Fitzjohn, were invited in July 1988 by the Tanzanian Government to establish a rehabilitation programme for the African Wild Dog (Lycaon pictus) involving capture, captive breeding and reintroduction.

The African Wild Dog is an extremely endangered species. Its existence is threatened by diseases, large predators (lions and hyenas), and man. Because of lack of game the dogs tend to get close to human settlements. As a consequence they are either poisoned or come in close contact with domesticated dogs. As the African Wild Dog is extremely susceptible to diseases transmitted by the domesticated dog (distemper, rabies and parvo virus), many of them die as a result from infection with these viruses.

It took many years and much searching before dens were finally located from which suitable pups could be collected. It was most important that the pups came from a non conservation area (Maasai Steppe), to prevent further, unnecessary, decline of numbers in the conservation areas. It was very likely that they would have been poisoned by pastoralists sooner or later.

Finally, the right moment arrived in early August 1995. Twenty-five pups were lifted from three different dens in the Maasai Steppe. At the time of lifting they were independent from their mother, that is to say they could eat solid food by themselves. They ranged in age from, approximately 3 to 5 weeks.

According to the location where they were found, they were called the Lendanai group (1/3), the Llondirrigiss group (7/1) and the Najo group (7/6). The pups were flown to Mkomazi Game Reserve (Kisima Camp) on the third of September 1995. For them and the people involved it meant a new start for the rescue of this subspecies East African Wild Dog.

With the arrival of the dogs it was decided to collect as much data as possible from the dogs without bothering the dogs too much and with a minimum of interference in their behaviour as possible. For these reasons blood samples were not taken on all occasions from all dogs. Pregnant females were left out from sedation as well alpha females and alpha males as long as their pups were less than three months old.

This report is divided into two sections: HUSBANDRY and VETERINARY WORK

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Husbandry – development of packs

The pups were flown into Kisima camp on September 3rd 1995, then were kept, separately, in the original litter formation. In December 1995 a transponder was inserted in the left side of the neck. It was now possible to identify them at all times. It was judged to be the right time to put the three litters together, and this happened on 21 December 1995. Without much quarrelling they settled themselves in a new social order and lived happily together for the first nine months of 1996. In August 1996 a request was received from KWS (Kenya Wildlife Service) for four male dogs. KWS had recently captured a pack of four adult females with hunting experience, due to stock raiding of sheep. Their intention was to add males to the pack and reintroduce the whole pack in the Serengeti-Mara ecosystem. With the permission of the Tanzanian Wildlife Department and the Serengeti Wildlife Research Institute, four males were sent to Kenya: Llondirrigiss 299, Najo 273, 288 and 303. KWS are preparing a separate report.

In December 1996 Llondirrigiss 297 came into season, which took us by surprise. Several of her brothers mated with her. The last male, who mated, was Najo 300. Separation of 297 was considered, but not effected as this might have caused big problems to reintroduce her in the pack. At the end of January 1997, 297 showed signs of pregnancy, but was still mounted by the males. On the fourth of March 1997 she gave birth to 6 pups. About a week before giving birth she spent more and more time in the den, being guarded by male Najo 300. After birth it was clear that he was the alpha male.

On March 9th the annual vaccinations, blood sampling etc. took place. This occasion was at the same time used as an opportunity to establish the final breeding packs. The large original pack was split into three smaller packs. 'Kisima Pack' in boma I, 'Lendanai Pack' in boma II and 'Sangito Pack' in boma III. See chapter Composition of breeding packs. The alpha female and male with the pups were left together, in peace, in the original compound. On April 8th 297 brought her pups out of the den for the first time. May 15th one female pup died. She was losing weight, while the others were prospering with no signs of disease. At the end of June, the Lendanai females showed signs of coming into season. Female 264 appeared to become the alpha female and Najo 274 the alpha male. Unfortunately 264 got a rectal prolapse and had to undergo surgery twice. After the second intervention, being separated for two days from the pack by a simple fence, she lost her leading position to female Lendanai 262. It was remarkable to note that in the original large pack she was the lowest in order. At the end of 1997 262 showed signs of pregnancy. October 17th was a very sad day: the mother of the pups, Llondirrigiss 297, died the day after she was sedated. The pups were big enough (7 months) to be independent of their mother. However, it was heart-warming to see how the father of the pups (Najo 300) gave special care and attention to the pups.

Husbandry – Zootechnique

1. Composition of packs

Lendanai	Llondimgiss	Najo
261F	289 M	265 F
262F	291M	273M
263M	293M	274M
264F	294M	275F
	296M	276F
	297F	284F
	298M	28SF
	299M	288M
		300 M
		303 M
		305 M
		308 F
		310M
1.30	7.10	7.60

F= Female
M= Male

Najo 273, 288, 303 and Llondirrigiss 299 to Kenya
Llondirrigiss 297 died October 1997

The following points were taken in consideration for the composition of the breeding packs:

- As little as possible of the genetic material should be lost
- No brother sister relationships
- "The most important characteristic of the average newly formed social group is, that all the females are related to each other, as are all the males, because the two sub-groups that join to form a new pack are usually groups of full siblings. From a genetic point perspective, although non-breeders do not have their own offspring to care for, those they provision and protect are close relatives (usually nieces and nephews)". (Running Wild, John MacNutt and Lesley Boggs, 1996). It is preferable, that full sisters of a litter of one pack form a new pack with the full brothers of a litter of another pack
- A breeding pack should consist of at least two females and two males. In case the alpha

female or male dies, there is no need to introduce a new female or male, with all the risks of fighting and getting badly hurt.

Taking these guidelines into account, the following packs were composed:

Boma1 II: Lendanai pack	Males		Females	
	Najo	274	Lendanai	261
		310		262
		311		264

At the end of the year (1997) the alpha's were: 274 and 262

Boma1 III: Sangito pack	Males		Females		
	Llondirrigiss	289	Najo		265
		291			275/306
		294			305
					308

At the end of the year (1997) there were still no alpha male and female. The composition of the Lendanai and Sangito packs was according to the guidelines mentioned above. Nine dogs were left in the original boma I

Boma I: Kisima pack					Najo/Llondirrigis			
	Males		Females		Males		Females	
	Llondirrigiss	293	Llondirrigiss	297	Kisima	333	Kisima	336
		296	Najo	276		335		337
		298		284				339
	Lendanai	263		285				
	Najo	300	(born 4th March 1997)					

The composition of the Kisima Pack was not in agreement with the above mentioned guidelines. It was more or less a leftover. Brother to sister relationship is possible. However, at the time of composing the packs, female Llondirrigiss 297 and male Najo 300 already were alpha female and male and had had their first litter (the Kisima pups). Unfortunately female 297 died. At the end of 1997 the hierarchy of the alpha female and alpha male had not yet been established; it would have to be a Najo female anyway, because only Najo females were left. If Najo 300 stays alpha male, there will be the undesirable situation of a brother/sister relationship and measures will have to be taken. Kisima pups (Najo x

Llondirrigiss) can only be used for future breeding in combination with Lendanai, not the Lendanai offspring (Najo x Lendanai).

2. Identification

Every time an animal was sedated, the transponder was checked. They were all in good working order except Najo 275. In March 1997, it appeared that her transponder was not being read by the reader. It was not possible to locate the transponder manually, so it was decided to bring in a new transponder number 306. The Kisima pups received their transponder in October 1997, numbers ending with 333, 335, 336, 337, 339. New photographs were taken from both sides of the dogs, in lateral recumbency, as an extra way of identification. Identification photographs were taken for the first time of the Kisima pups. All transponders started with letters and numbers NLD 093500110 followed by the three numbers to identify each animal.

3. Population genetics

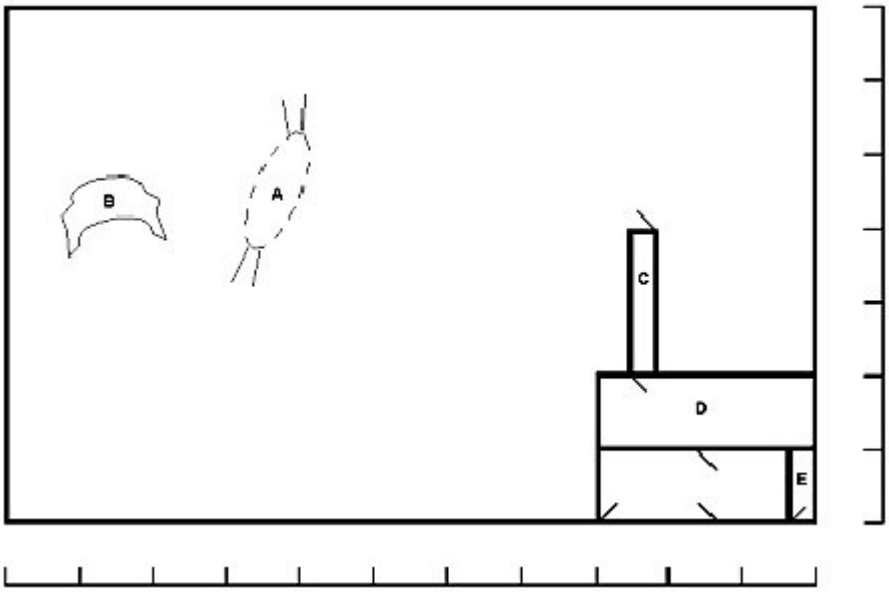
In order to investigate the genetic variation within and between the three original African Hunting Dog groups (Lendanai, Llondirrigiss and Najo), blood samples (EDTA blood) were taken in December 1995 and February 1996. The investigations were performed by the University of Groningen, Centre of Ecological and Evolutionary Studies, Population Genetics. In 1997, the results became available and showed that there was a considerable genetic variation - see attached report, Genetic Variation, from Dr. L. van de Zande. Female Llondirrigiss 297 gave birth to six pups on 4 March 1997. The behaviour of the male Najo 300 was consistent with that of an alpha male. However it was not certain that he is the father of the pups. Several males, brothers of 297, mated with the mother. EDTA blood samples were taken in October 1997 in order to investigate the fatherhood of the pups, which is important for breeding purposes. DNA fingerprinting made an end to speculations, Najo 300 proved to be the father of the pups. See attached report, Parenthood Analysis, from Dr. A.L. Kappe, Gendika B.V..

The combination of Najo and Llondirrigiss, makes the pups very suitable for a combination with Lendanai.

4. Housing

In 1997, two new, identical breeding enclosures (bomas) were built, size 55 m x 35 m. Within these enclosures each contained two connected smaller enclosures, size 15 m x 5 m. These were used for feeding and separation if required. Connected to the last of the small enclosures was a 9 m long wired passageway, width 1 m, height 1 m. This passageway could be divided in 3 parts, 3 m long each, by means of wired slides. Each compartment gave sufficient space for 3 full grown dogs, to make it possible to dart them by blowpipe in order to vaccinate or sedate them. Every evening, after being fed, they left through this passageway, which made them grow accustomed to it. In the enclosure an artificial den was

built with two opposite entrances. It was not possible for dogs or men to look into the den from the entrances. An artificial hill was provided as well. Natural shelter was provided by trees and thickets; artificial shelter was provided by a roof, 5 m x 2 m, constructed from palm leaves. The height of the fence was 2.25 m with an 80 cm extra overhang inside and outside. The fence was dug 60 cm into the soil and secured with heavy pieces of rock. The enclosures were situated in such a way, that the dogs from the different packs could hear each other, but could not see each other.



1 cm = 5 m

A. Den, B. Hill, C. Passageway, D. Feeding area, E. Shelter for sick or injured dogs.

5. Nutrition

The dogs were fed once a day. As a basis they received a commercial dog pellet, which was softened through soaking in water. Mixed with this dog food were pieces of cow meat. Once or twice a week a cow was bought and slaughtered, that is to say, as much meat as possible was taken from the cow and put into a freezer. The rest of the carcass was fed to the dogs. On the day they received the carcass, they did not receive the pellets. Pellets used were GILPA's "Valu Complete", a complete adult dog food. The moment the pups started to eat solid food, they received the same, softened, pellets with cow meat. The pups grew up with no, visible, bone abnormalities.

6. Bodyweight (see Appendix I)

It was only possible to measure the bodyweight of the dogs when they were sedated. On each sedation their bodyweight was taken. At an age of over 2 years apparently the average bodyweight of the males was 25 kg and the females 20 kg, as so little intensive research has been done on the bodyweight of these animals, it is not possible to estimate an average bodyweight accurately. Due to the fact that some of the dogs were somewhat overweight,

the average normal bodyweight might be 1 to 3 kg lower. It is interesting to note, that the Kisima pups weigh far more than the average dog of the original group at approximately the same age (7 months). Males average 4.5 kg and females 4 kg more. One has to take into account, that the number of Kisima pups is only 5 against 25 of the original group. Also the original group of 25 animals were fed as a whole group with heavy competition. The Kisima pups, at the time of weighing, were still fed separately, without any competition and they were fed partly commercial dog food, which did not happen with the original dogs at the same age.

Veterinary work – preventative medicine

This is the most important part of the work and takes the most time. It is far more better to prevent diseases than to cure diseased animals, particularly in the given situation whereby many animals are kept in relatively close confinement and contagious diseases will spread easily. The most dangerous diseases to the dogs are distemper, rabies and parvo virus infections. A programme is developed, in which the dogs are vaccinated against these diseases. In addition their blood is taken on a regular basis to study the effect of the vaccinations, which makes it possible to alter the vaccination schedules according to the results. Vaccination policy and results will be discussed in the chapter on Vaccinations. Another important part of preventive medicine is the prevention of parasites, which will be reported and discussed in the chapter on Parasites.

The African Hunting Dog is extremely susceptible to diseases like distemper, parvo and rabies. Little is known about the effect of vaccinations. The purpose of vaccinating the dogs in the first place is to protect them against the above mentioned diseases, and in the second place to study the effects of the vaccinations in the African Hunting Dog. As a common rule only inactivated (killed) vaccines were used for two reasons: to prevent spreading of viruses in the field and to prevent ill side-effects in the dogs.

Distemper - see appendix II
As there is no commercially available inactivated distemper vaccine, the vaccine was kindly donated by Prof. Osterhaus, Department of Virology, Erasmus University, Rotterdam.The problem with the CDV-ISCOM vaccine is, that it should be kept frozen until prior to use. It was decided to vaccinate the dogs three times in the first year, with a 14 and 30 day interval between the first and second and second and third vaccination. These three initial vaccinations were to be followed by an annual booster vaccination. In December 1995 and early 1996 the dogs were vaccinated three times. One month after the second vaccination they already showed a promising resistance (see Veterinary Report 1996). However, one year after the last vaccination (March 1997) it appeared that the quantity of neutralizing antibodies was only sufficient in 5 out of 19 dogs. At the time the blood sampling was done, the dogs received their annual booster vaccination. In October 1997 another neutralising antibodies test was done, this time none of the dogs had sufficient antibodies. Also the Kisima pups born in March 1997 did not develop enough antibodies after three vaccinations. The reason for this failure is probably the way the vaccines are stored. It is very difficult to keep a freezer in the bush at minus 20 degrees centigrade at all times. The freezer is run on solar energy and occasionally a generator, depending on the weather. The initial success is probably due to the fact that the vaccines were relative fresh at the time of injection. Another possibility for the subsequent lack of antibodies could be dueto the fact, that the batch of vaccines used was not in good order, which is being investigated at the moment.

Rabies - see appendix III
Initially it was expected, that one single annual vaccination would be sufficient to protect the dogs against rabies. However, 2 ½ month after the single vaccination serum was collected and antibodies tested, it showed that not a single dog developed sufficient antibodies (see Veterinary report 1996). Therefore it was decided to vaccinate the dogs in 1997 three times, the second vaccination one month after the first and the third one six months after the first. Antibody testing would be performed approximately one month, 5 months and 12 months after the third vaccination.

One month after the last vaccination (October 1997) antibodies were tested in 22 dogs. Due to shortage of vaccines 9 dogs received only two vaccinations, 13 dogs received the full three vaccinations. Except for one (Llondirrigiss 297) all the 13 dogs, who received 3 vaccinations, showed sufficient antibodies, more than 0.5 IU. From the 9 dogs, who received two vaccinations, only one (Llondirrigiss 291) showed more than 0.5 IU. The interim conclusion is that 3 vaccinations according to the above described schedule, resulted in sufficient antibodies against rabies in the African Hunting Dog and 2 vaccinations did not. In 1998 the testing of antibodies will be continued as well as the above mentioned vaccination schedule in the newborn pups. The adult dogs will receive one single annual booster vaccination.

(Solvay Duphar). Parvo virus infection and®Vaccine used was Dohyrab Leptospirosis. See appendix IV

The vaccination policy for parvo virus infection and leptospirosis is, that in the first year there are two vaccinations with a month in between. Second and following years a single booster vaccination annually. After the first two vaccinations (December 1995 and February

1996) they were well protected. The booster vaccination was given in March 1997. Serum, collected at the time of vaccination, showed that after one year they were still well protected. With this excellent result it was decided to stop the serum testing for parvo virus titres, the vaccination schedule proved to be successful. For practical reasons only the parvo virus antibodies were tested, this being the disease, of these two diseases, most dangerous to the dogs.

(Solvay Duphar).®Vaccine used was Dohyvac I-LP

2. PARASITES

Endoparasites

To prevent re-infection two times a day the faeces were removed from the enclosures. Originally once a month an anthelmintic was added to the food of the dogs. One tablet Drontal Plus* per 10 kg bodyweight. 7 March 1997 10 faeces samples were collected at random and fixed with 5% formaldehyde solution. The samples were checked at the University of Utrecht, Faculty Veterinary Medicine, Department Parasitology. All the samples proved to be negative. Due to this result it was decided to give the dogs the anthelmintic once every three months, except for the newborn pups. They still receive their anthelmintic every month, as soon as they eat solid food not regurgitated by their parents or other dogs. An annual faeces control for parasites and their eggs is planned.

(praziquantel, pyrantelembonaat, febantel), Bayer.®*Drontal Plus

Ectoparasites

On every occasion of sedation the skin of the dogs was checked for parasites. There appeared no signs of fungus or scabies and no ticks or fleas were found. It is our purpose to have any ticks found, investigated for carrying diseases.

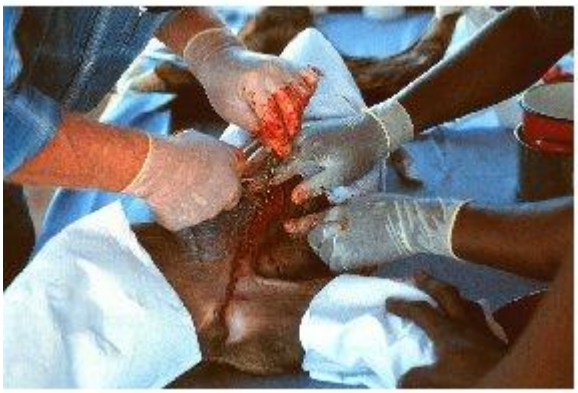
Veterinary work – clinical

1. Health problems

In 1997 only one dog, Lendanai 264, showed health problems. After achieving the position of alpha female in the Lendanai group, and having mated and being probably pregnant, she showed a rectal prolapse in July.

Surgery took place, whereby the rectum was repositioned and colopexy performed, in which the colon was fixed to the abdominal wall 15 cm caudal from the navel with 3 stitches, to prevent recurrence of the prolapse.

Despite that, the rectal prolapse reoccurred in early October. This time a rectal amputation was performed, whereby the prolapsed part was resected 2 cm distal from the anus. On both occasions the dog recovered well with no complications. However after the last operation she lost her position as the alpha female, being separated for 2 days from the pack, although she had contact with her pack mates through the fence.



2. Sedation

Drugs used were Domitor*(medetomidine hydrochloride) and ketamine HCL. As antidote for the Domitor* Antisedan*(atipamezole hydrochloride) was used.

The drugs were administered by blowpipe, intramuscularly, in the hindquarters. For that purpose the dogs were enclosed in a small cage, 2 or 3 at the time, to avoid confusion during the darting process.

In general the dogs received 1 ml Domitor* per 10 kg bodyweight, topped up with 0.1 ml ketamine HCL per dog, independent of their bodyweight. All dogs received 1.5 ml Antisedan* after 30 minutes of sedation. This combination proved to be very satisfactory, the dogs were well sedated for the purpose of taking blood samples, applying transponders, measuring their bodyweight etc.

Induction time varied from 5 to 15 minutes. Recovery time approximately 5 minutes, with hardly any side-effects from the ketamine HCL afterwards.

For her surgical intervention female Lendanai 264 received 2 ml Domitor* + 0.5 ml ketamine HCL on both occasions. This proved to be a good combination and dosage for this kind of surgery.

Only on one occasion did things wrong. In October female Llondirrigiss 297 was routinely sedated according to the above mentioned dosage. At the time of sedation she was not excited and looked normal. Sedation went smoothly, blood samples etc. were taken. However, after administering the Antisedan*, she hardly responded, only panted. After 15 minutes another dose of Antisedan* was administered, just in the unlikely event that the first syringe was not completely emptied in her body.

Five minutes after the second dose of Antisedan she staggered around in a heavy ataxic way. Shock being suspected short acting dexamethason was administered intramuscularly. She went into a den and stayed there still heavily breathing. It was not possible to administer fluid by either subcutaneous or intravenous methods, as the dog would have to be sedated again, which would have caused her death for sure. The next morning she had expired. Autopsy revealed shock, see Pathology. Although it was a very sad experience, nothing could have been done to prevent this, as everything had gone normally. One has to

realize, that after more than 100 sedations, an occurrence like this is likely to happen, however sad it is.

*Domitor â (medetomidine hydrochloride), Pfizer
*Antisedan â (atipamezole hydrochloride), Pfizer

Veterinary work – pathology

Autopsy was performed on dog Llondirrigiss 297, female. Macroscopic examination gave the following results:

Good bodily condition. Mucous membranes pale. Lungs hyperaemia. Heart petechiae in heartmuscle. Liver, spleen and kidneys hyperaemia. Stomac haemorrhagic mucosa; duodenum, jejunum and colon haemorrhagic mucosa and blood in lumen. Uterus, ovariae and bladder no abnormalities.

Histology:

Lung:	peri-brochial brown pigment in clusters, sometimes clearly containing crystals . Locally oedema. In some bronchiae repulsing of bronchial epithelia with sometimes some large macrophages. Paramyxo negative.
Intestines:	too autolytic for good judgement
Liver:	in many blood vessels larger bacterial rods (bacteriae associated with decomposition?), a fair number of lipocytes.
Kidneys:	hyperaemia in glomeruli and marrow: shock
Spleen:	depleted, many macrophages and necrosis
PAP-Carr	negative

Conclusion: Shock, chronic bronchitis.

Macroscopic examination was performed on the spot in Kisima camp. Microscopic examination was performed by University of Utrecht, the Netherlands, Faculty Veterinary Medicine, Department Pathology Exotic Animals.

Parts of organs were preserved and transported in a 4% formaldehyde solution.

Llondirrigiss 297

Veterinary work – clinical chemistry

CLINICAL CHEMISTRY - see appendix V

Heparinised plasma samples were collected 9 March 1997, to get an impression of specific blood values of some dogs. These values might serve as reference in case of future problems. Urea levels seemed slightly high compared to the domesticated dog.

Summary

In 1995 the George Adamson Wildlife Preservation Trusts started a breeding programme for the African Wild Dog (Lycaon pictus) in the Mkomazi Game Reserve, Tanzania. A historic survey is given about the origin and the development of the breeding packs. The way the packs were composed and the identification of the individual dogs, by way of transponders, is described. DNA fingerprinting was performed in order to study the genetic variation within and between the original litters.

Genetic variation proved to be considerable.

DNA fingerprinting was also used to establish the father of the firstborn litter.

The housing, the way the dogs are fed and the development of bodyweight are described.

Emphasized is the preventive medicine. In order to protect the dogs well they were vaccinated against distemper, rabies, parvo virus infection and leptospirosis. To establish the effectiveness of the vaccinations antibody testing was performed. Three rabies vaccinations, one month between the first and second and five months between the second and the third, proved to be successful. Two vaccinations were not enough. The result of the distemper vaccinations was unclear, further research is required. The schedule of the parvo virus infection vaccinations, two times in the first year followed by one annual vaccination, proved to be satisfactory.

For sedation a Domitor ® ketamine HCL combination was used.

For surgery the same combination was used on one occasion, a rectal prolapse. The combination proved to be successful and safe, despite one casualty. Autopsy was performed and results are given

Appendix I

Body weight in kilograms (kg)
African hunting dogs, Mkomazi Game Reserve

		Date	19/12/1995	29/02/1996	09/03/1997	15/10/1997
Identification		Sex	kg	kg	kg	kg
Lendanai	261	F	12	13.1	20.5	- - -
Lendanai	262	F	11.1	12	19	- - -
Lendanai	263	M	13.3	14.5	23.3	25.5
Lendanai	264	F	12.4	14.1	21	- - -
Llondirrigiss	289	M	- - -	13.7	22	- - -
Llondirrigiss	291	M	9.2	11.9	20.2	- - -
Llondirrigiss	293	M	10	12.7	22	22.5
Llondirrigiss	294	M	10.5	14	25	28
Llondirrigiss	296	M	10	12.8	23.5	- - -
Llondirrigiss	297	F	9.1	13	- - -	22
Llondirrigiss	298	M	11.1	15.5	25.5	27
Llondirrigiss	299	M	10.5	14.3	Kenya	
Najo	265	F	8.1	9	17.2	19.5
Najo	273	M	9.1	10.5	Kenya	
Najo	274	M	9.8	12.4	22.5	- - -
Najo 275	306	F	9.2	11.5	18.5	20.8
Najo	276	F	8.7	10.5	17.5	15
Najo	284	F	8.1	9.8	16.5	15.8
Najo	285	F	8	9.5	17	15.9
Najo	288	M	10.1	12	Kenya	
Najo	300	M	9.8	11.8	- - -	23
Najo	303	M	9.7	11.9	Kenya	
Najo	305	M	9.5	11.2	19	22.3
Najo	308	F	8.3	10.7	19	22.5
Najo	310	M	8.8	11.8	22	- - -
Kisima	333	M				17.8
Kisima	335	M				17
Kisima	336	F				14.5
Kisima	337	F				15.7
Kisima	339	F				16.1

Average body weight:

Date	Age (approx)	Male	Female
29/02/1996	7 months	12.84	11.31
09/03/1997	19 months	22.91	18.52
15/10/1997	27 months	25.67	19.23
Kisima pups			

15/10/1997	7½ months	17.4	15.43

Appendix II

Distemper antibody level (VNT)
African hunting dogs, Mkomazi Game Reserve

		Date	19/12/1995	29/02/1996	09/03/1997	15/10/1997	
Identification		Sex	D-0 NT-titer	D-0 NT-titer	D-0 NT-titer	D-0 NT-titer	
Lendanai	261	F	540/++	20/±	20		
Lendanai	262	F	20/+	60/+	<20		
Lendanai	263	M	540/++	60/+	<20	<20	
Lendanai	264	F	< 20/-	60/+	20	<20	
Llondirrigiss	289	M	20/-	< 20/-	<20	<20	
Llondirrigiss	291	M		180/+	20	<20	
Llondirrigiss	293	M	< 20/-	60/+	<20	<20	
Llondirrigiss	294	M		20/±	<20	<20	
Llondirrigiss	296	M		60/+	20	<20	
Llondirrigiss	297	F		< 20/-		<20	died
Llondirrigiss	298	M		20/±	<20	<20	
Llondirrigiss	299	M	180/+	60/+	Kenya		
Najo	265	F	20/-	20/±	20	<20	
Najo	273	M		60/+	Kenya		
Najo	274	M		< 20/-	<20		
Najo 275	306	F	60/+	60/+	<20	<20	
Najo	276	F		180/+	<20	<20	
Najo	284	F		60/+	<20	<20	
Najo	285	F		180/+	<20	<20	
Najo	288	M		540/++	Kenya		
Najo	300	M	60/+	20/±		<20	
Najo	303	M	< 20/-	20/±	Kenya		
Najo	305	M	20/-	60/+	<20	<20	
Najo	308	F		20/±	<20	<20	
Najo	310	M		60/+	<20		
Kisima	333	M				<20	
Kisima	335	M				<20	
Kisima	336	F				<20	
Kisima	337	F				<20	
Kisima	339	F				<20	

Vaccination dates: 19-12-1995, 03-01-1996, 14-02-1996, 09-03-1997 (except for Kisima pups)

Vaccination dates Kisima pups: 28-06-1997, 02-08-1997, 27-09-1997

Neutralizing antibodies were tested. 20 and up means well protected

Appendix III

Rabies antibody levels
African hunting dogs, Mkomazi Game Reserve

		Date	29/02/1996	09/03/1997	15/10/1997	
Identification		Sex	I.U.	I.U.	I.U.	
Lendanai	261	F	0	<0.5		
Lendanai	262	F	0	0.5		
Lendanai	263	M	0	>0.5	>0.5	
Lendanai	264	F	0	>0.5	>0.5	
Llondirrigis	289	M	0	<0.5	<0.5 *	
Llondirrigis	291	M	0	<0.5	>0.5 *	
Llondirrigis	293	M	0	>0.5	>0.5	
Llondirrigis	294	M	0	<0.5	<0.5 *	
Llondirrigis	296	M	0	<0.5	>0.5	
Llondirrigis	297	F	0		<0.5	died
Llondirrigis	298	M	0	<0.5	>0.5	
Llondirrigis	299	M	0	Kenya		
Najo	265	F	0	<0.5	>0.5	
Najo	273	M	0	Kenya		
Najo	274	M	0	<0.5		
Najo 275	306	F	0	<0.5	>0.5	
Najo	276	F	0	<0.5	>0.5	
Najo	284	F	0	<0.5	>0.5	
Najo	285	F	0	>0.5	>0.5	
Najo	288	M	0	Kenya		
Najo	300	M	0		>0.5	
Najo	303	M	0	Kenya		
Najo	305	M	0	>0.5	>0.5 *	
Najo	308	F	0	<0.5	>0.5	
Najo	310	M	0	>0.5		
Kisima	333	M			<0.5 *	
Kisima	335	M			<0.5 *	
Kisima	336	F			<0.5 *	
Kisima	337	F			<0.5 *	
Kisima	339	F			<0.5 *	

* Two times vaccinated at the time of testing (15-10-97).

Vaccination dates: 19-12-1995, 09-03-1997, 09-04-1997, 22-09-1997 (except nos 289, 291, 294 and 305, whi

Vaccination dates Kisima pups: 28-06-1997, 02-08-1997, 15-10-1997

Resistance against rabies is measured in International Units (I.U.)
0.5 I.U. and up means well protected

ch received the last vaccination on 15-10-97 instead of on 22-09-97.)

Appendix IV

Parvo antibody level
African hunting dogs, Mkomazi Game Reserve

		Date	29/02/1996	09/03/1997	
Identification		Sex	Ig G	Ig G	
Lendanai	261	F	13,500	100	
Lendanai	262	F	1,500	90	
Lendanai	263	M	4,500	150	
Lendanai	264	F	1,500	270	
Llondirrigis	289	M	1,000	270	
Llondirrigis	291	M	13,500	270	
Llondirrigis	293	M	1,500	100	
Llondirrigis	294	M	1,500	90	
Llondirrigis	296	M	500	90	
Llondirrigis	297	F	4,500		died
Llondirrigis	298	M	1,500	100	
Llondirrigis	299	M	1,500	Kenya	
Najo	265	F	1,500	100	
Najo	273	M	1,500	Kenya	
Najo	274	M	1,000	30	
Najo 275	306	F	1,500	90	
Najo	276	F	500	90	
Najo	284	F	500	80	
Najo	285	F	1,500	90	
Najo	288	M	1,500	Kenya	
Najo	300	M	1,500		
Najo	303	M	13,500	Kenya	
Najo	305	M	1,500	90	
Najo	308	F	4,500	90	
Najo	310	M	100		

Vaccination dates: 19-12-95, 15-02-96, 09-03-97
Vaccination dates Kisima pups: 28-06-97 and 02-08-97
Serum not tested for antibodies
Ig G from 20 and up means well protected

Clinical chemistry							
African hunting dogs, Mkomazi Game Reserve							
		ALKP	ALT	UREA	CA	CREA	PHOS
Identification		IU	IU	mmol/l	mmol/l	mmol/l	mmol/l
Lendanai	261	114	10	17.17	2.39	68	0.83
Lendanai	262	186	76	15.05	2.59	99	1.93
Llondirrigiss	289	67	36	11.99	2.52	149	1.7
Llondirrigiss	291	25	46	12.36	2.51	129	1.88
Llondirrigiss	294	49	34	10.61	2.48	141	1.69
Llondirrigiss	296	42	31	11.94	2.57	146	2.14
Najo	265	58	17	16.54	2.07	83	2.32
Najo 275	306	22	15	14.49	2.55	66	2.75
Najo	276	461	32	15.44	2.72	100	2.38
Najo	284	352	37	15.75	2.49	97	2.29
Najo	285	162	43	12.77	2.59	135	1.73
Najo	310	212	40	11.7	2.47	120	2.11
Chemistry performed by Vettest 8008							