

LIMPOPO NATIONAL PARK

Helicopter Census

12th to 19th of November 2010



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GENERAL INFORMATION

The 2010 helicopter game census was initially planned for August/September utilizing A Robinson 44 type helicopter. Due to delays in approvals the census only started on the 12th November, after 35mm of rain. This resulted in a green flush of the Mopane as well as a sudden, large supply and wide distribution of water. Due to the nature of the work, the large areas to be flown, high temperatures and crew required, a Bell 206 Jet ranger helicopter was used. This was integral to the success of the operation.

Operations were based from the Massingir office for the first four days, covering the southern sections. The base moved to Gaza Safaris to complete the central and northern sections until completion.

Due to the rains, visibility was good, moderate winds with cloud cover, kept temperatures down.

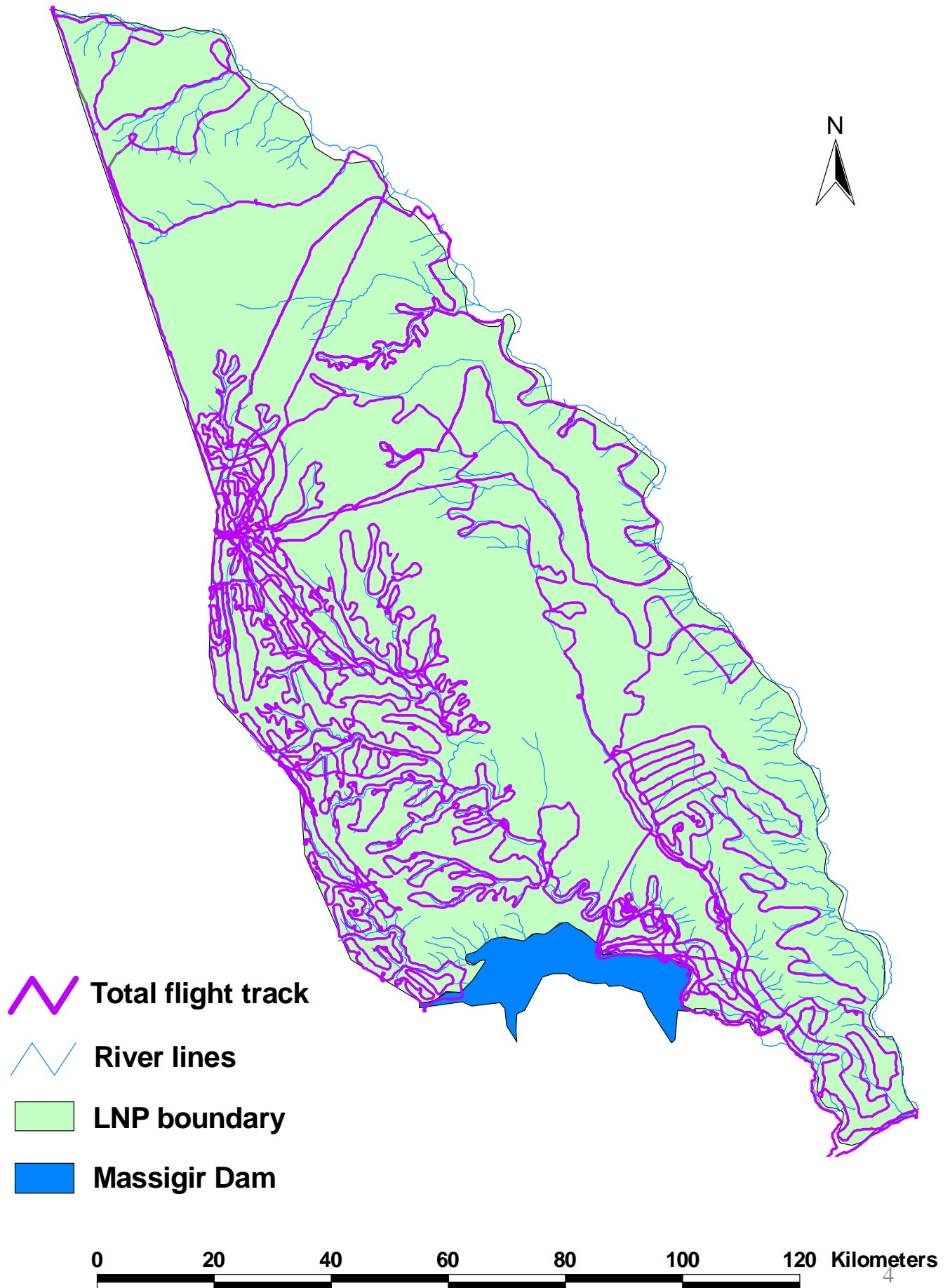
All major rivers with their tributaries and basins were flown, watersheds were completed methodically before moving on to the next system. Virtually all sightings of buffalo and elephant were within a few meters from water. It was noted that fresh game tracks/spoor were highly visible in all cases thanks to the recent rains. This aided the location and observation of elephant/buffalo. All other game sightings were noted, in most cases these were only random and obvious sightings of animals directly below the helicopter since the speed, track and altitude flown would certainly result in an undercount of general game species.

The helicopter was flown between 250 and 350 feet agl (depending on vegetation density) at ground speeds averaging 65 knots. A pre determined route was flown after planning from a topographical map, gaining information from local knowledge and experience of Billy Swannepoel. Tracking and navigation was achieved with a moving map GPS and situational awareness/accuracy was achieved using a moving map computer that displayed all previous sightings and position, ensuring no double counting.

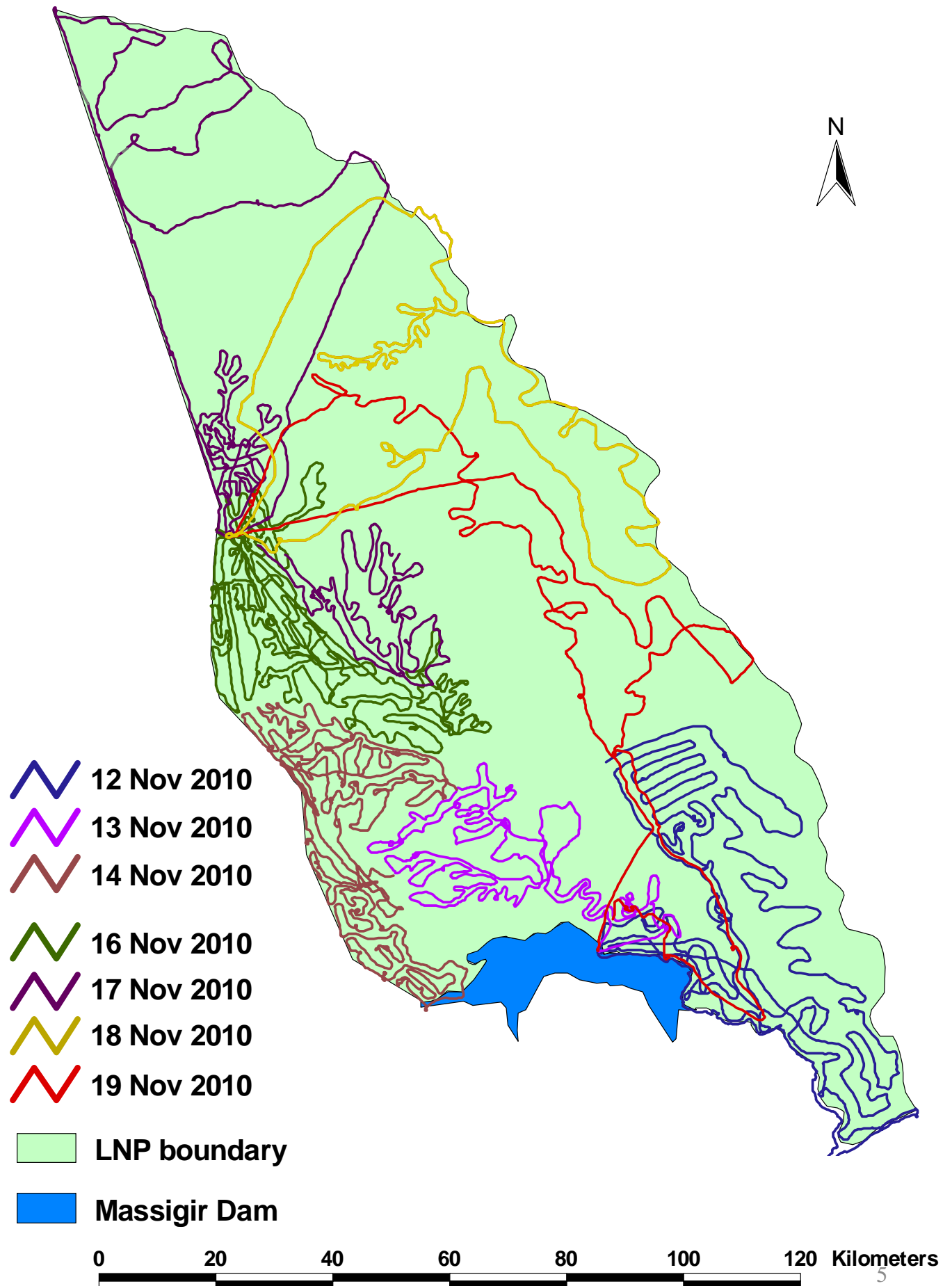
All four crew members worked to locate elephant/buffalo. Once sighted the helicopter hovered over the groups, splitting the herds where required in order to photograph and count individuals, information was then logged onto the computer.

Although this census was a success in terms of method, the only way to improve on accuracy will be to do the count in September, before any green flush or ³ rainfall.

Total flight track



Daily flight track



Summarized total of all species counted

Species	Unknown	Male	Female	Sub-adult	Juvenile	Yearling	Carcass	Total
Baboon Troop	14	0	0	0	0	0	0	14
Buffalo	865	130	0	0	4	0	2	1001
Bushbuck	18	0	0	0	0	0	0	18
Bushpig	10	0	0	0	10	0	0	20
Crocodile	19	0	0	0	0	0	0	19
Duiker	26	0	0	0	0	0	0	26
Elephant	102	164	295	177	173	96	7	1014
Jackal	1	0	0	0	0	0	0	1
Giraffe	37	0	1	0	1	0	0	39
Hippo	32	0	0	0	0	0	0	32
Hornbill	61	0	0	0	0	0	0	61
Impala	332	10	0	0	0	0	0	342
Kudu	284	7	0	0	0	0	1	292
Monkey	5	0	0	0	0	0	0	5
Nyala	260	26	7	0	0	0	0	293
Ostrich	42	1	1	0	17	0	0	61
Rhino White	0	0	0	0	0	0	6	6
Sable Antelope	37	3	3	2	11	0	0	56
Steenbok	7	0	0	0	0	0	0	7
Warthog	14	0	0	0	0	0	0	14
Waterbuck	49	13	0	0	0	0	1	63
Wildebeest Blue	125	8	0	0	0	0	0	133
Zebra Burchell	292	0	0	0	0	0	0	292
Total	2632	362	307	179	216	96	17	3809

Unknown: sex / age undetermined

Male and Female: adult

For the elephant population:

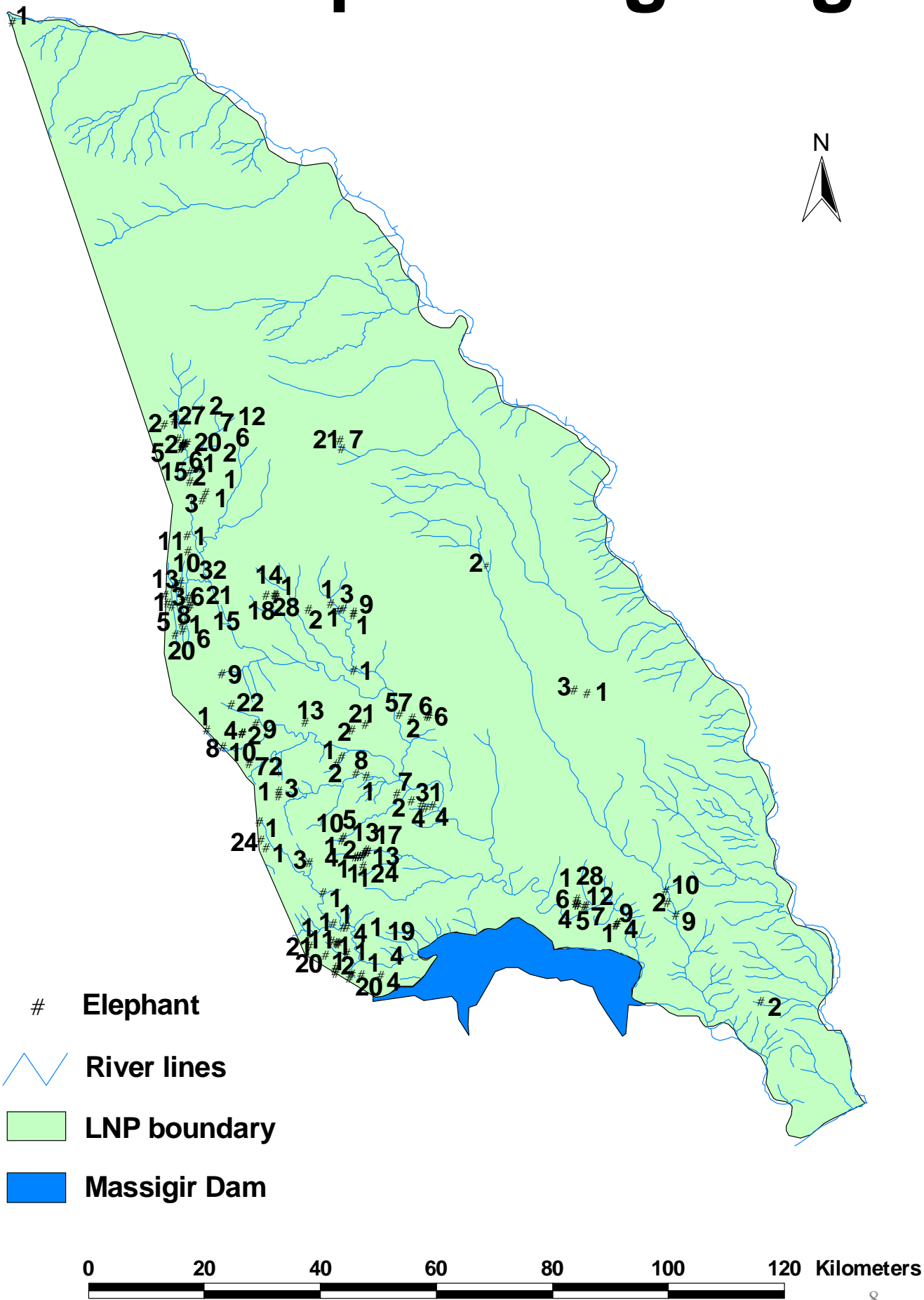
Sub-adult: from 3 to 6 years of age

Juvenile: from 1 to 3 years of age

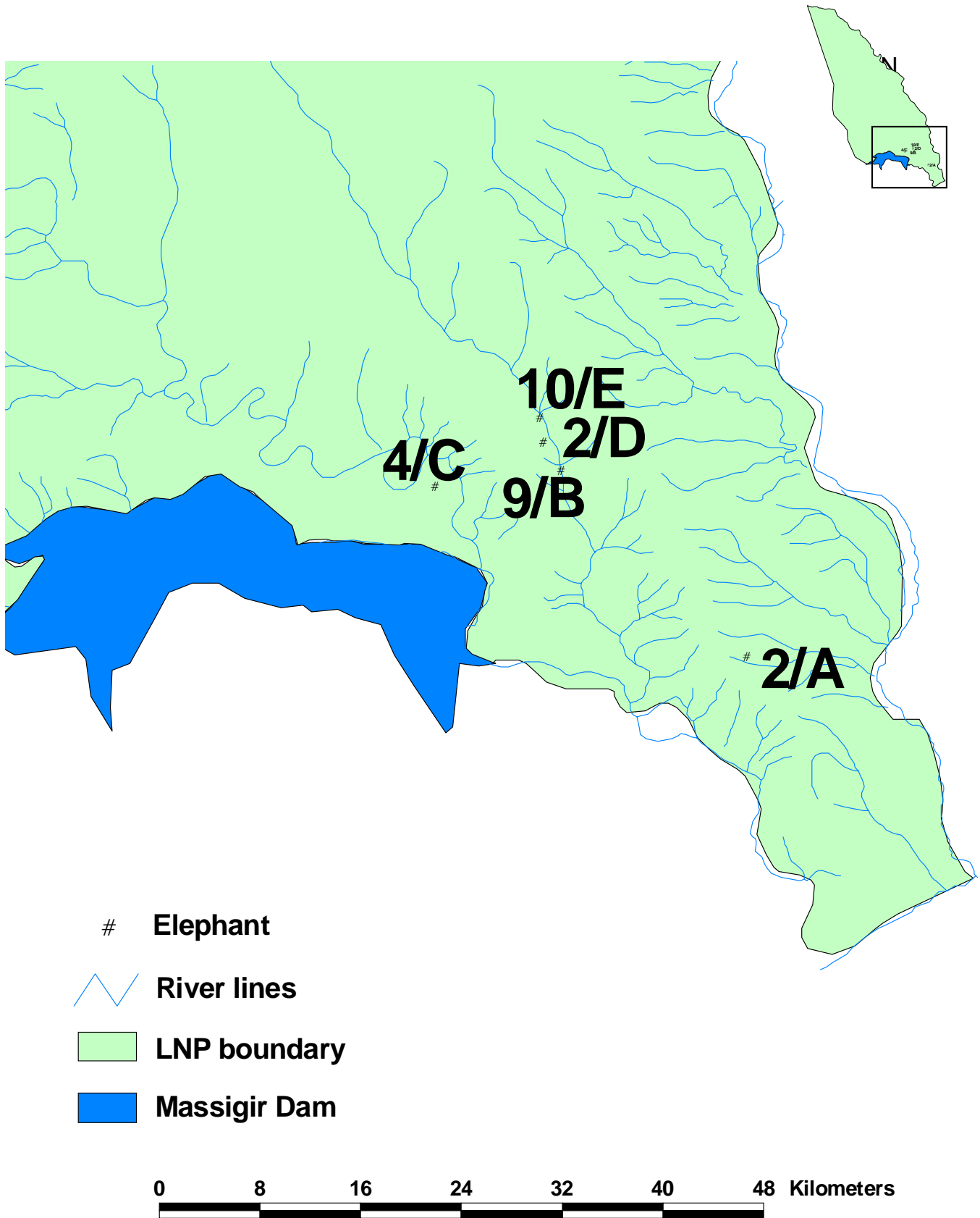
Yearling: animal under a year old

ELEPHANT

Total elephant sighting



Elephant sighting 12 Nov 2010

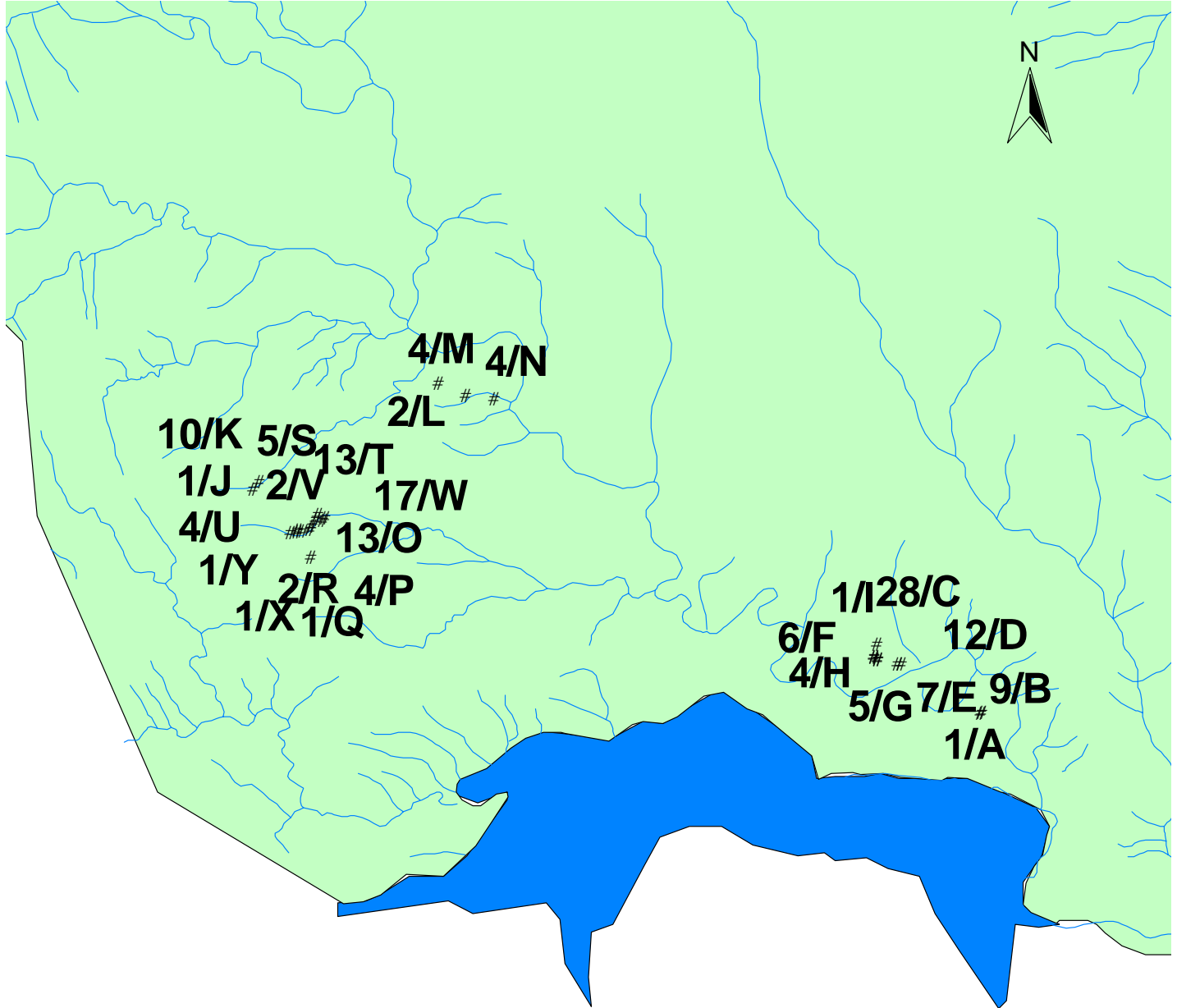


Detailed Elephant Sighting

12th of November 2010

Map ref	Longitude	Latitude	unknown	male	female	subadult	juvenile	Yearling	Total
2/A	32.47572	-23.95500333	0	2	0	0	0	0	2
4/C	32.253195	-23.833795	0	0	1	2	1	0	4
2/D	32.33057	-23.80232833	0	2	0	0	0	0	2
9/B	32.32813	-23.78457667	0	10	0	0	0	0	10
10/E	32.34320333	-23.82205667	0	9	0	0	0	0	9

Elephant sighting 13 Nov 2010

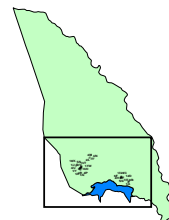


Elephant

~ River lines

■ LNP boundary

■ Massigir Dam



0 8 16 24 32 40 48 Kilometers

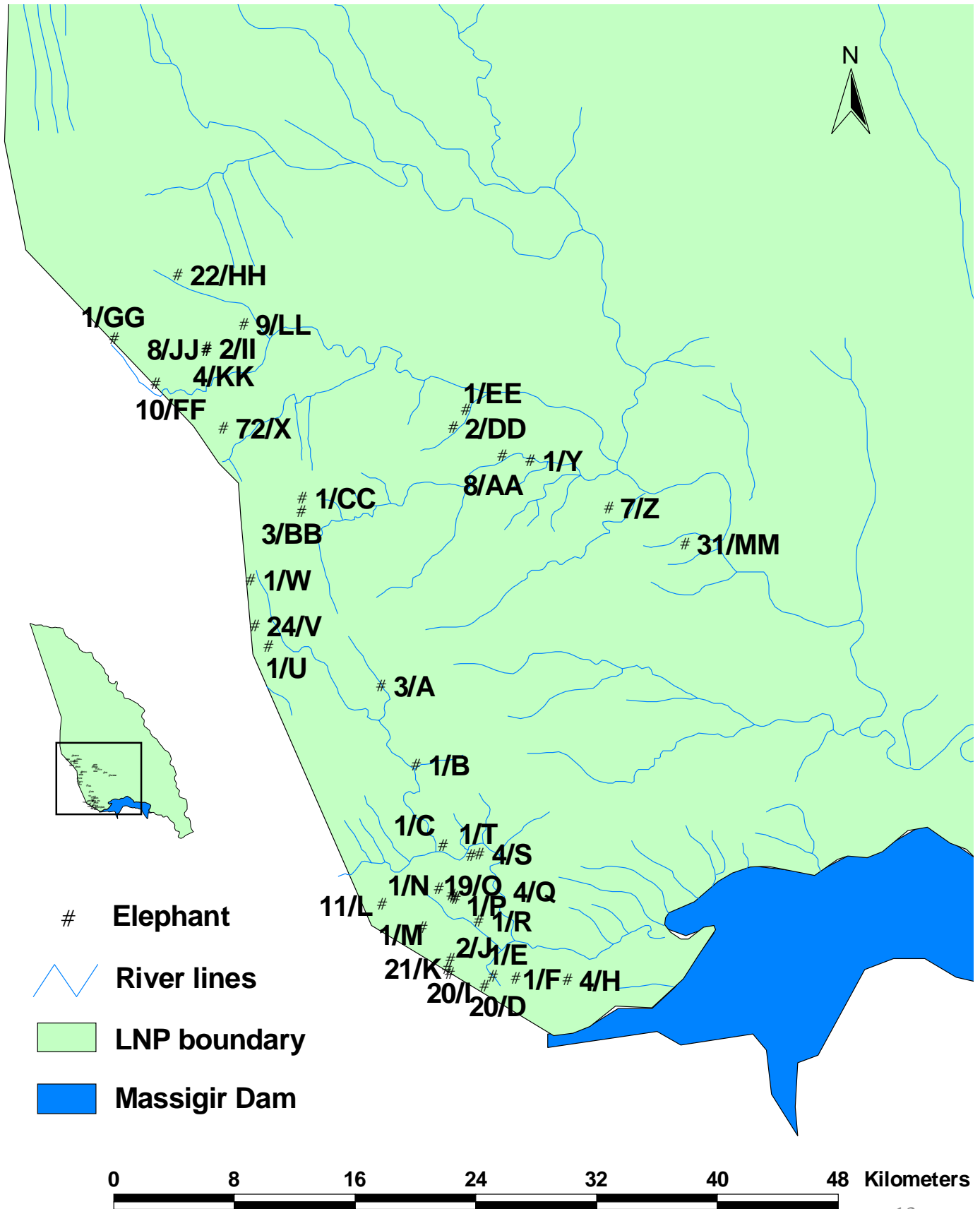
A horizontal scale bar with alternating black and white segments, marked with the numbers 0, 8, 16, 24, 32, 40, and 48, followed by the word "Kilometers".

Detailed Elephant Sighting

13th of November 2010

Map ref	Longitude	Latitude	unknown	male	female	subadult	juvenile	Yearling	Total
1/A	32.25135833	-23.83652667	0	1	0	0	0	0	1
9/B	32.25036333	-23.83708833	0	0	3	2	3	1	9
28/C	32.20200167	-23.80805	0	28	0	0	0	0	28
12/D	32.20428	-23.80808	0	0	6	1	4	1	12
7/E	32.18964333	-23.796825	0	0	3	2	2	0	7
6/F	32.18785167	-23.80379667	0	0	1	1	3	1	6
5/G	32.18788167	-23.80419333	0	0	1	2	2	0	5
4/H	32.190455	-23.80566667	0	0	2	1	0	1	4
1/I	32.19047	-23.80607667	0	1	0	0	0	0	1
1/J	31.82807	-23.70164333	0	1	0	0	0	0	1
10/K	31.82465667	-23.70561667	0	0	3	2	3	2	10
2/L	31.93319833	-23.64414	0	2	0	0	0	0	2
4/M	31.96566333	-23.65283333	0	4	0	0	0	0	4
4/N	31.949005	-23.65114167	0	4	0	0	0	0	4
13/O	31.86294833	-23.720575	0	0	3	3	4	3	13
4/P	31.86645667	-23.72314	0	1	1	1	1	0	4
1/Q	31.865655	-23.72386333	0	1	0	0	0	0	1
2/R	31.86137167	-23.723585	0	2	0	0	0	0	2
5/S	31.85933333	-23.72780833	0	0	2	1	2	0	5
13/T	31.85808667	-23.729525	0	0	5	2	5	1	13
4/U	31.85420167	-23.73053833	0	0	2	1	1	0	4
2/V	31.85049333	-23.73007833	0	0	1	1	0	0	2
17/W	31.85046	-23.73090167	0	0	6	2	6	3	17
1/X	31.846455	-23.73135833	0	1	0	0	0	0	1
1/Y	31.85851	-23.74576833	0	1	0	0	0	0	1

Elephant sighting 14 Nov 2010

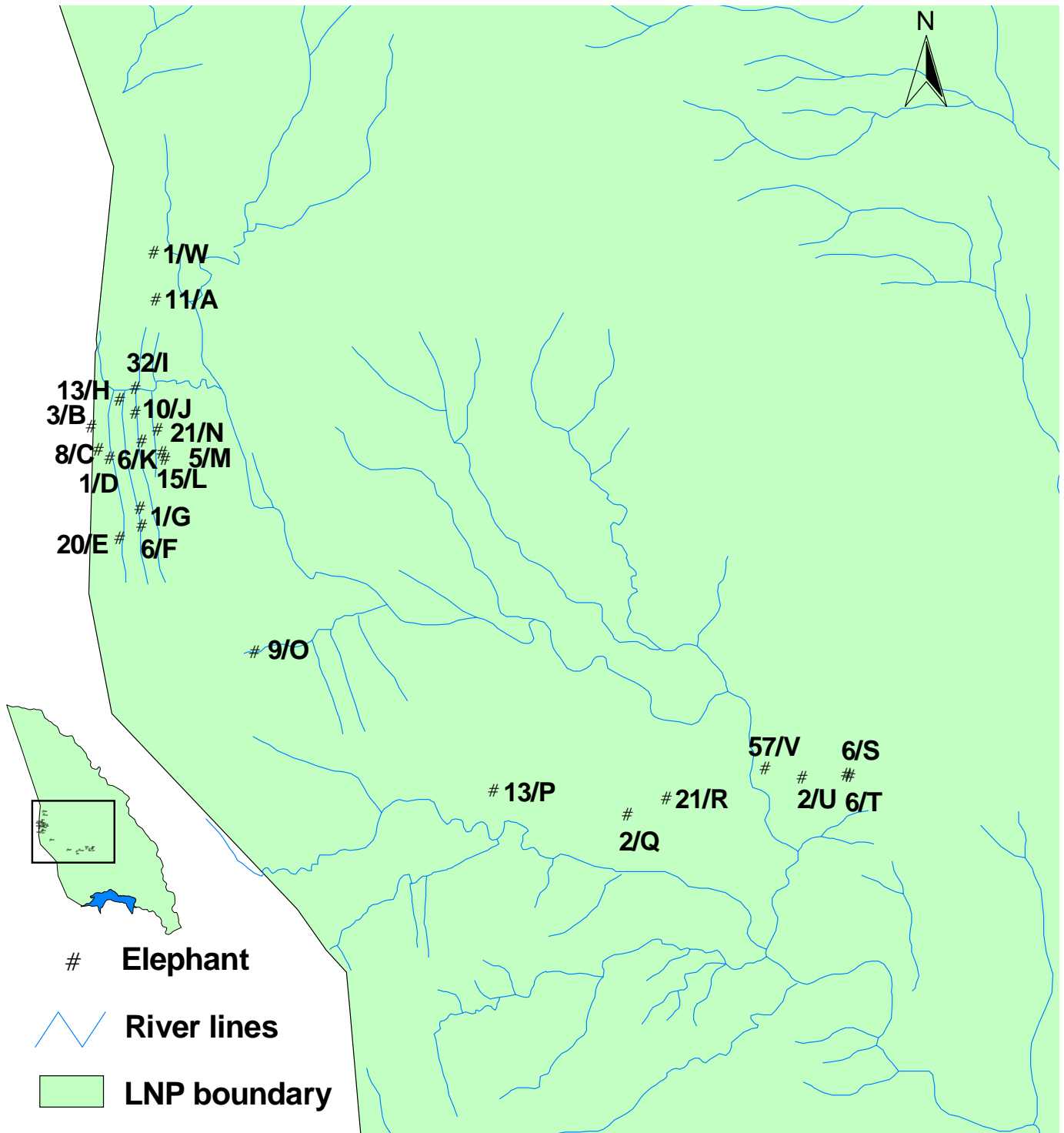


Detailed Elephant Sighting

14th of November 2010

Map ref	Longitude	Latitude	unknown	male	female	subadult	juvenile	Yearling	Total
3/A	31.775005	-23.74030667	0	0	2	0	1	0	3
1/B	31.79572667	-23.78735	0	1	0	0	0	0	1
1/C	31.81186167	-23.83531	0	1	0	0	0	0	1
20/D	31.83652333	-23.91938	0	0	7	2	9	2	20
1/E	31.84146167	-23.91335833	0	1	0	0	0	0	1
1/F	31.85504333	-23.91470333	0	1	0	0	0	0	1
4/G	31.88583667	-23.91541833	0	4	0	0	0	0	4
20/H	31.81604	-23.911425	0	0	8	2	7	3	20
2/I	31.81633	-23.902895	0	0	1	1	0	0	2
21/J	31.81437333	-23.90840667	0	0	11	4	4	2	21
11/K	31.77551	-23.87003167	0	0	5	3	2	1	11
1/L	31.79964333	-23.88448333	0	1	0	0	0	0	1
1/M	31.80923	-23.86116667	0	1	0	0	0	0	1
19/N	31.818315	-23.86613	0	0	7	3	7	2	19
1/O	31.81953333	-23.86715833	0	0	0	0	1	0	1
4/P	31.81705667	-23.86484333	0	4	0	0	0	0	4
1/Q	31.83299833	-23.88037667	0	1	0	0	0	0	1
4/R	31.83371167	-23.840545	0	4	0	0	0	0	4
1/S	31.82846	-23.84128833	0	1	0	0	0	0	1
1/T	31.707895	-23.71701333	0	1	0	0	0	0	1
24/U	31.69971333	-23.70465167	0	2	9	6	5	2	24
1/V	31.69741	-23.67746833	0	1	0	0	0	0	1
72/W	31.68121	-23.586815	51	4	0	13	0	4	72
1/X	31.86396667	-23.60644667	0	1	0	0	0	0	1
7/Y	31.91063667	-23.63441333	0	7	0	0	0	0	7
8/Z	31.84720167	-23.60299667	0	0	2	2	4	0	8
3/AA	31.72771833	-23.63663667	0	3	0	0	0	0	3
1/BB	31.72806833	-23.62846833	0	1	0	0	0	0	1
2/CC	31.817725	-23.58677	0	2	0	0	0	0	2
1/DD	31.82565833	-23.57586333	0	1	0	0	0	0	1
10/EE	31.64066833	-23.56025	0	0	5	1	4	0	10
1/FF	31.61612333	-23.53371167	0	1	0	0	0	0	1
22/GG	31.65381	-23.49568	0	0	6	2	11	3	22
2/HH	31.67101167	-23.53884	0	0	1	1	0	0	2
8/II	31.67078333	-23.54052833	0	0	2	1	4	1	8
4/JJ	31.670875	-23.54071	0	4	0	0	0	0	4
9/KK	31.69290833	-23.52507333	0	0	2	2	4	1	9
31/LL	31.95612	-23.65575167	0	0	12	3	13	3	31

Elephant sighting 16 Nov 2010

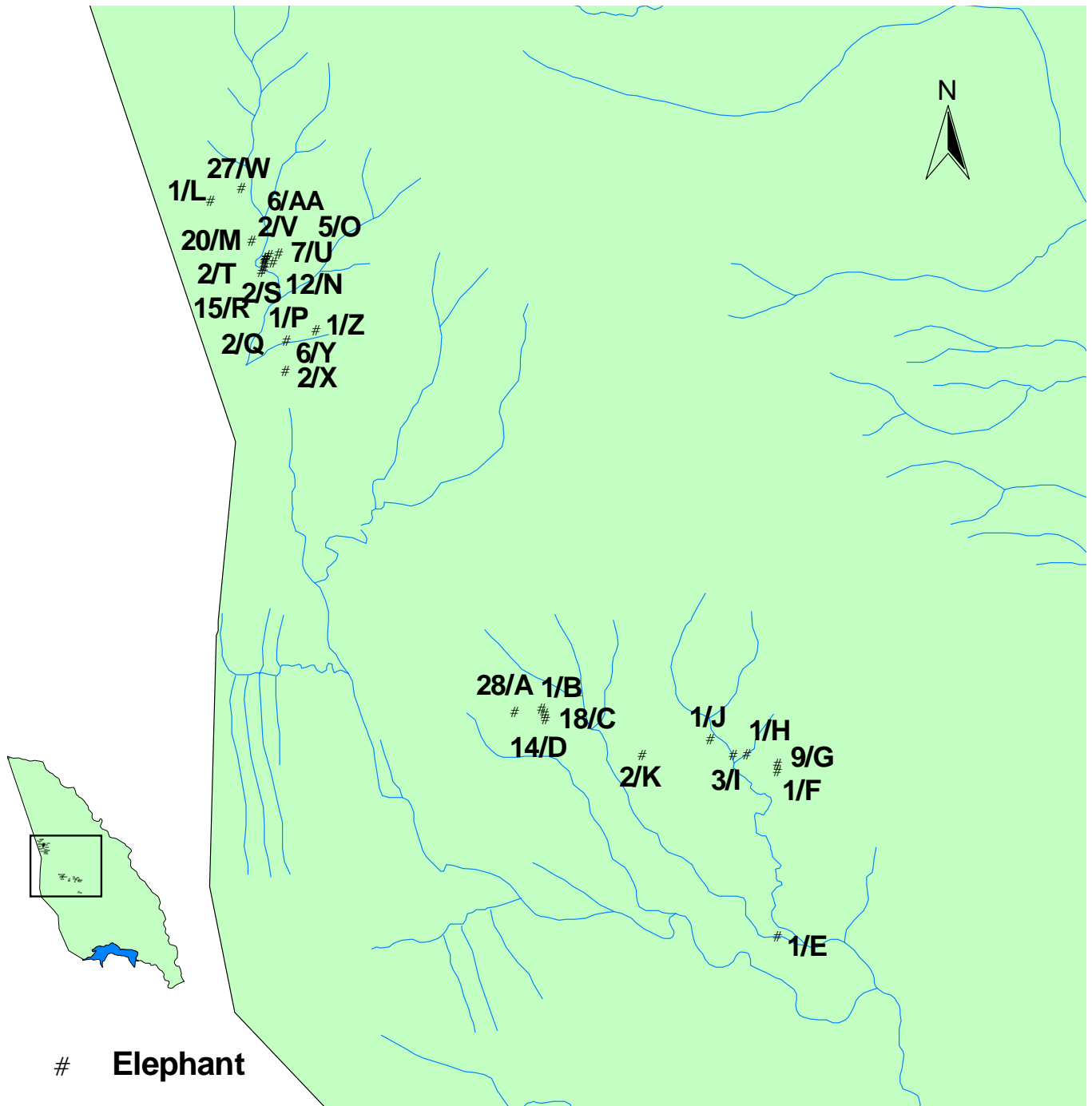


Detailed Elephant Sighting

16th of November 2010

Map ref	Longitude	Latitude	unknown	male	female	subadult	juvenile	Yearling	Total
11/A	31.58687833	-23.25743333	0	0	5	4	1	1	11
3/B	31.55218833	-23.32642833	0	3	0	0	0	0	3
8/C	31.55613167	-23.33867667	0	0	3	1	2	2	8
1/D	31.56185833	-23.34326	0	1	0	0	0	0	1
20/E	31.5676	-23.38634	0	1	9	4	4	2	20
6/F	31.57952667	-23.379535	0	0	2	1	2	1	6
1/G	31.57851667	-23.36990667	0	1	0	0	0	0	1
13/H	31.567585	-23.31198667	0	0	5	2	3	3	13
32/I	31.57569833	-23.30522833	0	0	15	11	2	4	32
10/J	31.57563333	-23.31868167	0	0	4	4	0	2	10
6/K	31.57920167	-23.33396333	0	0	3	2	0	1	6
15/L	31.591605	-23.34345	0	0	6	3	4	2	15
5/M	31.59023333	-23.33986333	0	1	2	1	1	0	5
21/N	31.58787	-23.32749	0	0	9	6	2	4	21
9/O	31.639855	-23.44767333	0	0	2	4	3	0	9
13/P	31.76895333	-23.52209	0	0	7	3	1	2	13
2/Q	31.840725	-23.53471	0	2	0	0	0	0	2
21/R	31.86158167	-23.5259	0	0	13	4	2	2	21
6/S	31.95872167	-23.51327	0	0	2	2	2	0	6
6/T	31.96055	-23.51384	0	0	2	1	3	0	6
2/U	31.93461333	-23.51528167	0	0	2	0	0	0	2
57/V	31.915095	-23.51005	50	1	0	0	0	6	57
1/W	31.58557	-23.23292	0	1	0	0	0	0	1

Elephant sighting 17 Nov 2010



Elephant

~ River lines

■ LNP boundary

■ Massigir Dam

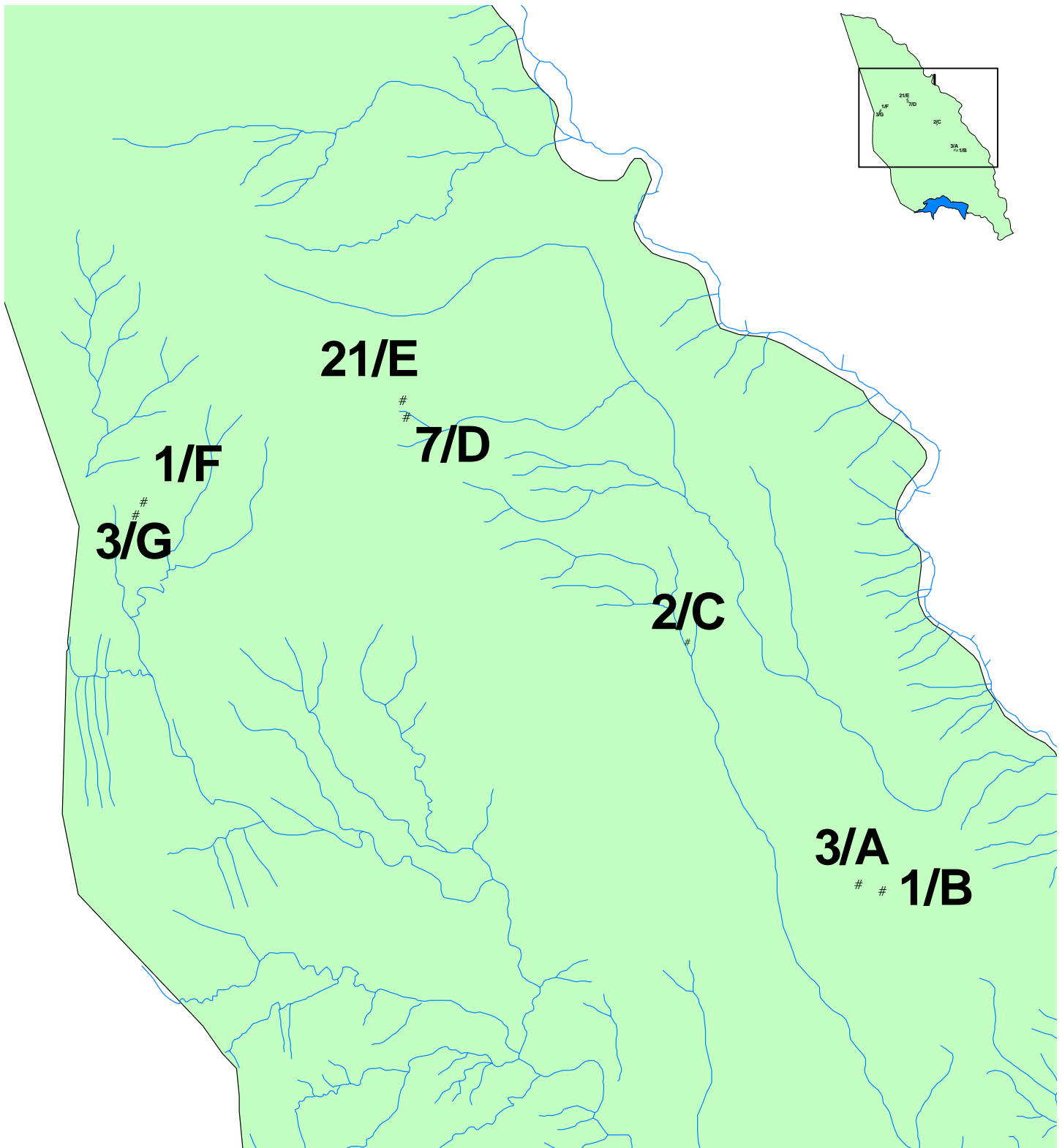


Detailed Elephant Sighting

17th of November 2010

Map ref	Longitude	Latitude	unknown	male	female	subadult	juvenile	Yearling	Total
28/A	31.70772333	-23.32569833	0	0	12	7	5	4	28
1/B	31.72142	-23.324205	0	1	0	0	0	0	1
18/C	31.72285833	-23.32652	0	0	8	7	1	2	18
14/D	31.72343167	-23.32942667	0	0	7	3	2	2	14
1/E	31.84314167	-23.44159333	0	1	0	0	0	0	1
1/F	31.84349667	-23.356105	0	1	0	0	0	0	1
9/G	31.84320833	-23.35241833	0	0	3	4	0	2	9
1/H	31.82728667	-23.34733833	0	1	0	0	0	0	1
3/I	31.82076	-23.34808833	0	3	0	0	0	0	3
1/J	31.80847667	-23.33951833	0	1	0	0	0	0	1
2/K	31.77361333	-23.34771167	0	2	0	0	0	0	2
1/L	31.550765	-23.06184	0	1	0	0	0	0	1
20/M	31.57193833	-23.08250667	0	0	7	6	4	3	20
12/N	31.58093333	-23.09009667	0	0	6	2	1	3	12
5/O	31.57925833	-23.09121167	0	0	2	1	2	0	5
1/P	31.57926	-23.091665	0	1	0	0	0	0	1
2/Q	31.57894167	-23.09228833	0	0	1	0	1	0	2
6/AA	31.57881667	-23.09284833	0	6	0	0	0	0	6
15/R	31.578665	-23.09518833	0	0	6	3	3	3	15
2/S	31.578495	-23.09710667	0	2	0	0	0	0	2
2/T	31.57700833	-23.09831333	0	2	0	0	0	0	2
7/U	31.58283333	-23.09350667	0	0	3	2	2	0	7
2/V	31.58578667	-23.08898333	0	0	1	0	0	1	2
27/W	31.56663833	-23.05523667	0	0	13	7	4	3	27
2/X	31.589465	-23.14955667	0	2	0	0	0	0	2
6/Y	31.5899	-23.13398833	0	0	2	2	2	0	6
1/Z	31.60523333	-23.12843833	0	1	0	0	0	0	1
1/BB	31.315175	-22.43621833	1	0	0	0	0	0	1

Elephant sighting 18 & 19 Nov 2010



 LNP boundary  River lines # Elephant

0 10 20 30 40 50 60 Kilometers

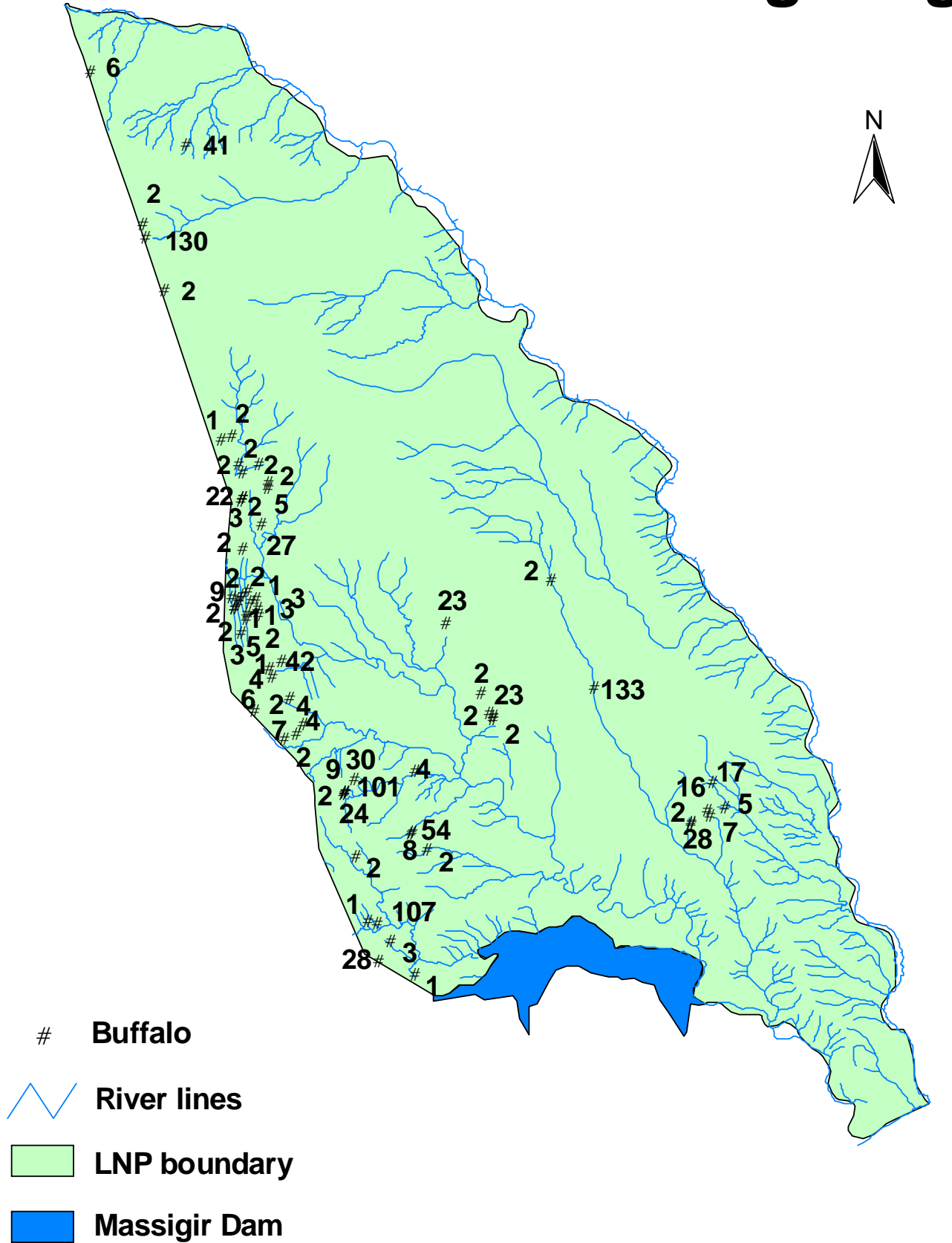


Detailed Elephant Sighting 18th and 19th of November 2010

Map ref	Longitude	Latitude	unknown	male	female	subadult	juvenile	Yearling	Total
7/D	31.82593262	-23.09483475	0	0	3	2	1	1	7
21/E	31.82595198	-23.09384795	0	0	10	3	5	3	21
3/G	31.610712	-23.17821482	0	3	0	0	0	0	3
1/F	31.6170426	-23.16896606	0	1	0	0	0	0	1
2/C	32.05133691	-23.27848242	0	2	0	0	0	0	2
3/A	32.20890488	-23.47748841	0	1	0	0	0	0	3
1/B	32.19742963	-23.47131992	0	3	0	0	0	0	1

BUFFALO

Total buffalo sighting



0 20 40 60 80 100 120 Kilometers

Detailed Buffalo Sighting 12th to 14th of November 2010

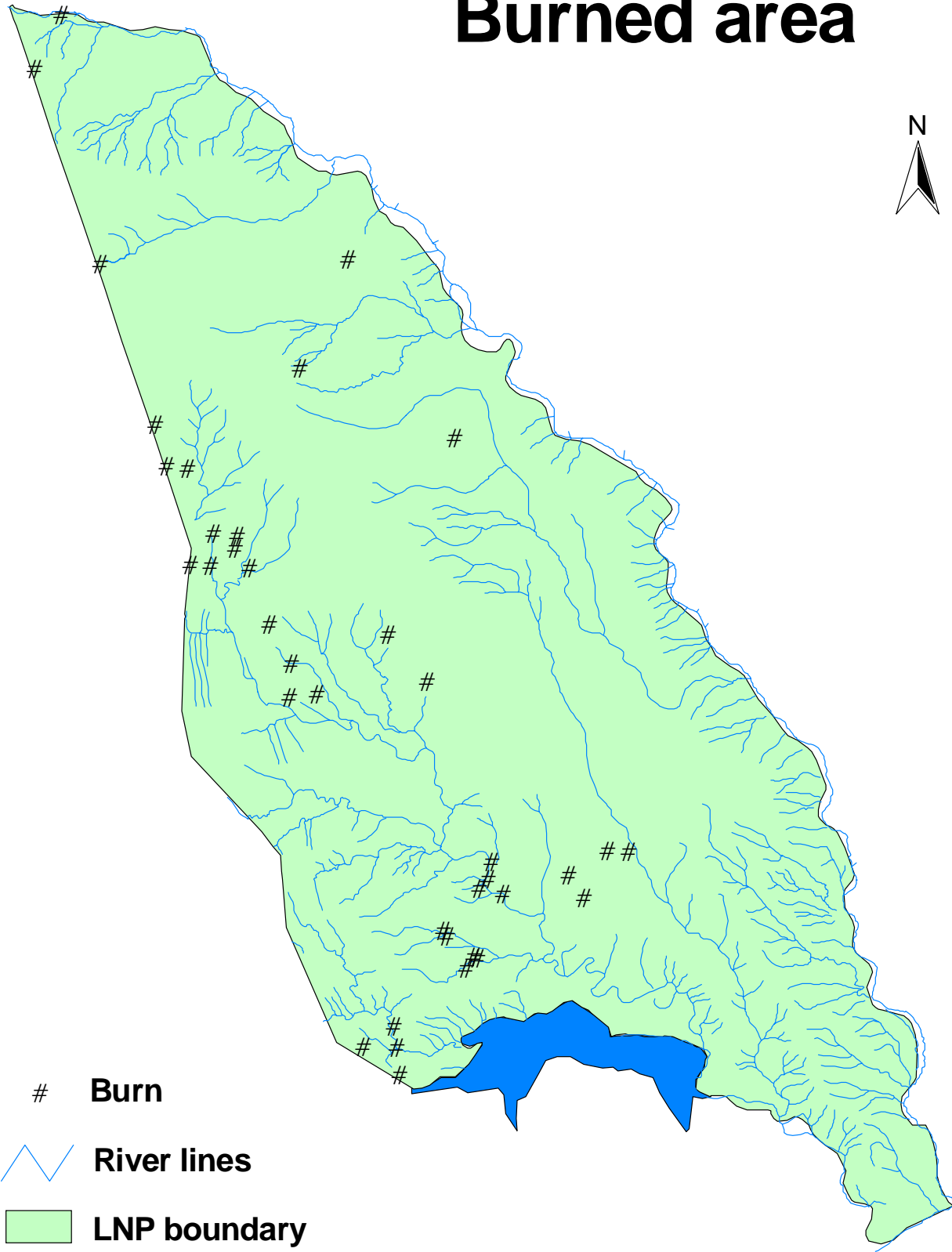
Species	date and time	longitude	latitude	unknown	male	female	subadult	juvenile	Yearling	Total
Buffalo	12 Nov 2010 10:12:59	32.27071833	-23.68184	28	0	0	0	0	0	28
Buffalo	12 Nov 2010 10:14:52	32.27107833	-23.68446833	0	2	0	0	0	0	2
Buffalo	12 Nov 2010 10:57:56	32.30491667	-23.61895	17	0	0	0	0	0	17
Buffalo	12 Nov 2010 11:06:10	32.29499	-23.66289833	0	7	0	0	0	0	7
Buffalo	12 Nov 2010 11:07:18	32.30052167	-23.67184167	12	0	0	0	4	0	16
Buffalo	12 Nov 2010 11:12:24	32.323755	-23.65954167	0	5	0	0	0	0	5
Buffalo	13 Nov 2010 01:50:34	31.864695	-23.72414833	0	2	0	0	0	0	2
Buffalo	13 Nov 2010 12:51:19	31.84197333	-23.69766833	8	0	0	0	0	0	8
Buffalo	13 Nov 2010 12:51:53	31.84010833	-23.69819333	54	0	0	0	0	0	54
Buffalo	14 Nov 2010 01:31:38	31.59890667	-23.50907333	0	6	0	0	0	0	6
Buffalo	14 Nov 2010 01:36:18	31.64477333	-23.55443833	0	7	0	0	0	0	7
Buffalo	14 Nov 2010 01:40:20	31.66315167	-23.54476	0	2	0	0	0	0	2
Buffalo	14 Nov 2010 01:54:48	31.65215833	-23.49185	0	4	0	0	0	0	4
Buffalo	14 Nov 2010 02:04:56	31.67321667	-23.53009167	0	4	0	0	0	0	4
Buffalo	14 Nov 2010 07:08:26	31.84520667	-23.91602333	0	1	0	0	0	0	1
Buffalo	14 Nov 2010 07:33:31	31.789665	-23.89595667	28	0	0	0	0	0	28
Buffalo	14 Nov 2010 07:43:01	31.80857167	-23.864935	0	3	0	0	0	0	3
Buffalo	14 Nov 2010 08:00:45	31.77297167	-23.833	107	0	0	0	0	0	107
Buffalo	14 Nov 2010 08:01:43	31.78693667	-23.83787167	0	1	0	0	0	0	1
Buffalo	14 Nov 2010 11:08:10	31.753445	-23.73376667	0	2	0	0	0	0	2
Buffalo	14 Nov 2010 11:53:32	31.84564833	-23.60381333	0	4	0	0	0	0	4
Buffalo	14 Nov 2010 12:02:13	31.73735333	-23.63418833	24	0	0	0	0	0	24
Buffalo	14 Nov 2010 12:03:01	31.73753333	-23.63647667	2	0	0	0	0	0	2
Buffalo	14 Nov 2010 12:03:38	31.736955	-23.63682333	9	0	0	0	0	0	9
Buffalo	14 Nov 2010 12:04:20	31.73447333	-23.63854167	101	0	0	0	0	0	101
Buffalo	14 Nov 2010 12:22:03	31.75165833	-23.61666333	30	0	0	0	0	0	30

Detailed Buffalo Sighting 16th to 19th of November 2010

Species	date and time	longitude	latitude	unknown	male	female	subadult	juvenile	Yearling	Total
Buffalo	16 Nov 2010 06:12:36	31.57691833	-23.18585833	0	3	0	0	0	0	3
Buffalo	16 Nov 2010 06:26:06	31.60842333	-23.22437	27	0	0	0	0	0	27
Buffalo	16 Nov 2010 06:34:46	31.61873333	-23.16841667	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 09:38:34	31.58009	-23.261105	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 09:56:46	31.56376167	-23.33526167	0	5	0	0	0	0	5
Buffalo	16 Nov 2010 09:57:36	31.566765	-23.35156333	0	3	0	0	0	0	3
Buffalo	16 Nov 2010 09:57:40	31.56694833	-23.35285167	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 10:14:33	31.57694167	-23.38900833	0	1	0	0	0	0	1
Buffalo	16 Nov 2010 10:31:52	31.57313333	-23.34301833	0	9	0	0	0	0	9
Buffalo	16 Nov 2010 10:32:06	31.57246	-23.33866	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 10:40:46	31.58056167	-23.33140333	0	1	0	0	0	0	1
Buffalo	16 Nov 2010 10:42:57	31.585325	-23.36119	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 10:43:15	31.58664833	-23.367845	0	1	0	0	0	0	1
Buffalo	16 Nov 2010 10:50:24	31.62196333	-23.44626667	0	4	0	0	0	0	4
Buffalo	16 Nov 2010 10:56:43	31.60385167	-23.36208	0	1	0	0	0	0	1
Buffalo	16 Nov 2010 10:57:14	31.60197333	-23.35201	0	3	0	0	0	0	3
Buffalo	16 Nov 2010 10:58:18	31.59296167	-23.341215	2	0	0	0	0	0	2
Buffalo	16 Nov 2010 11:02:30	31.58891833	-23.32497333	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 11:05:50	31.59945	-23.33798333	0	3	0	0	0	0	3
Buffalo	16 Nov 2010 11:24:55	31.63995667	-23.433725	42	0	0	0	0	0	42
Buffalo	16 Nov 2010 11:26:30	31.62493	-23.45840167	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 04:25:13	31.96624333	-23.52237333	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 04:26:10	31.96493833	-23.51841667	23	0	0	0	0	0	23
Buffalo	16 Nov 2010 04:29:54	31.95935833	-23.51400833	0	2	0	0	0	0	2
Buffalo	16 Nov 2010 04:40:29	31.94652	-23.48335167	0	2	0	0	0	0	2
Buffalo	17 Nov 2010 08:53:24	31.89367833	-23.37556	23	0	0	0	0	0	23
Buffalo	17 Nov 2010 06:40:39	31.54678167	-23.09288667	0	1	0	0	0	0	1
Buffalo	17 Nov 2010 06:42:34	31.56352	-23.08623	0	2	0	0	0	0	2
Buffalo	17 Nov 2010 07:36:24	31.57277667	-23.13059833	0	2	0	0	0	0	2
Buffalo	17 Nov 2010 07:48:00	31.60442833	-23.13055333	0	2	0	0	0	0	2
Buffalo	17 Nov 2010 07:55:35	31.58000333	-23.14219	0	2	0	0	0	0	2
Buffalo	17 Nov 2010 07:57:46	31.58068833	-23.18136667	0	5	0	0	0	0	5
Buffalo	17 Nov 2010 07:57:58	31.580025	-23.182135	22	0	0	0	0	0	22
Buffalo	17 Nov 2010 01:08:46	31.45993333	-22.86266	0	2	0	0	0	0	2
Buffalo	17 Nov 2010 01:13:33	31.43023833	-22.78065667	130	0	0	0	0	0	130
Buffalo	17 Nov 2010 01:14:30	31.42657167	-22.76055833	2	0	0	0	0	0	2
Buffalo	17 Nov 2010 01:27:21	31.346075	-22.52538667	0	6	0	0	0	0	6
Buffalo	17 Nov 2010 02:20:25	31.49343667	-22.637865	41	0	0	0	0	0	41
Buffalo	11/19/2010 7:41	31.62312367	-23.15993775	0	2	0	0	0	0	2
Buffalo	11/19/2010 8:36	32.05569156	-23.30769628	0	2	0	0	0	0	2
Buffalo	11/19/2010 8:52	32.12279163	-23.47600481	133	0	0	0	0	0	133

WATER
&
FIRE

Burned area



Burn

— River lines

■ LNP boundary

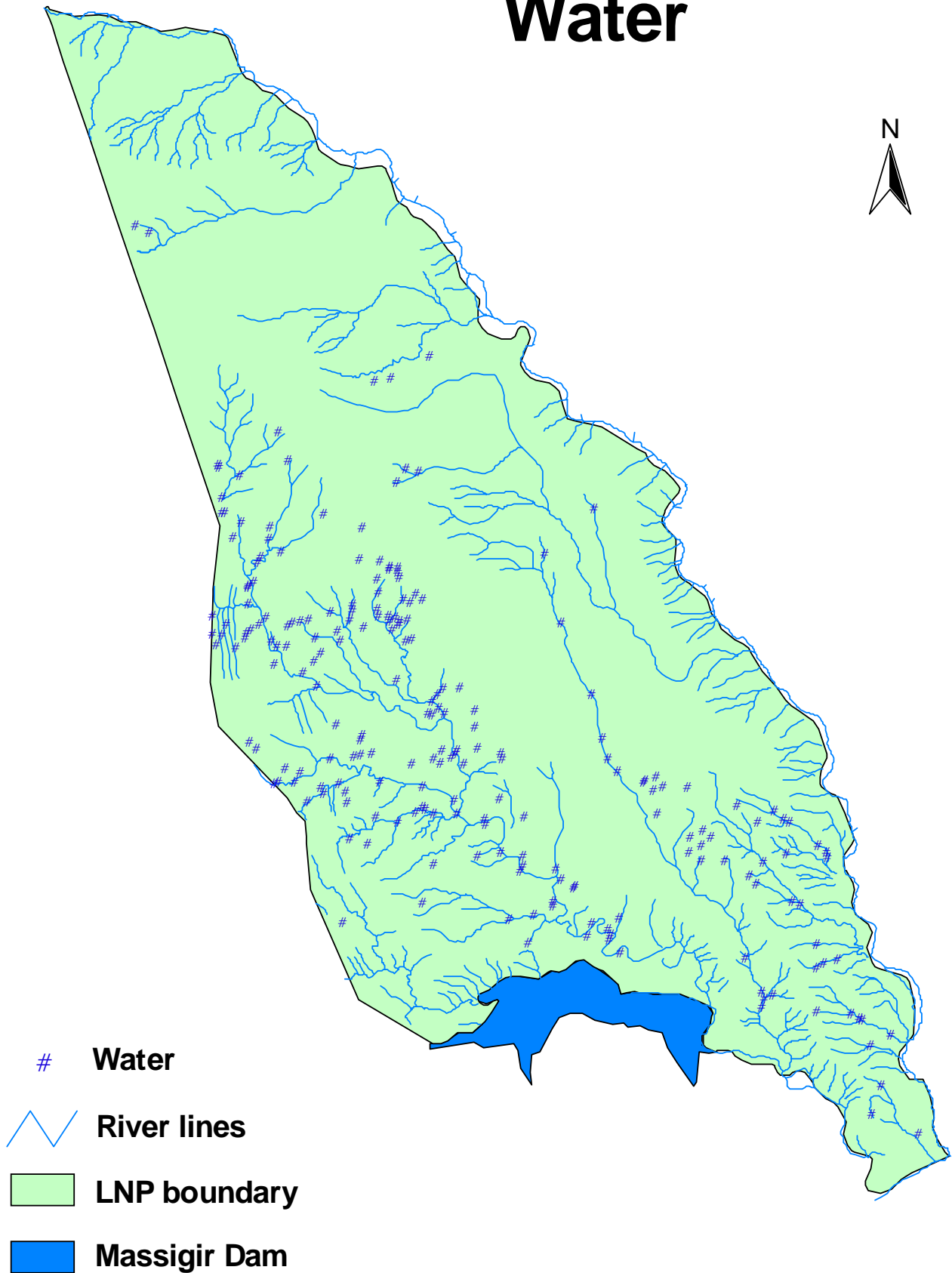
■ Massigir Dam

0 20 40 60 80 100 120 Kilometers

Sightings of burned area

Sighting	date and time	longitude	latitude
Fire	12 Nov 2010 10:26:19	32.180425	-23.61582
Fire	12 Nov 2010 05:43:22	32.14987167	-23.61333
Fire	13 Nov 2010 12:30:41	31.98084833	-23.65354667
Fire	13 Nov 2010 12:37:24	31.98676833	-23.63037333
Fire	13 Nov 2010 01:20:46	31.969875	-23.66784167
Fire	13 Nov 2010 01:29:12	32.00358	-23.675975
Fire	13 Nov 2010 01:45:21	31.91802333	-23.72701333
Fire	13 Nov 2010 03:42:27	31.96174833	-23.76425833
Fire	13 Nov 2010 03:51:29	31.92356833	-23.73498
Fire	13 Nov 2010 03:58:59	31.96661667	-23.7656
Fire	13 Nov 2010 04:10:44	31.95085667	-23.780425
Fire	13 Nov 2010 04:30:08	32.09539167	-23.648625
Fire	13 Nov 2010 04:32:55	32.11697667	-23.68096167
Fire	14 Nov 2010 06:52:39	31.848965	-23.86125
Fire	14 Nov 2010 07:07:01	31.85659	-23.93061833
Fire	14 Nov 2010 07:25:52	31.85230333	-23.89179
Fire	14 Nov 2010 07:40:27	31.80600833	-23.88985667
Fire	16 Nov 2010 06:11:11	31.58983167	-23.21125667
Fire	16 Nov 2010 06:33:45	31.62539833	-23.18817
Fire	16 Nov 2010 06:35:55	31.62807	-23.16981
Fire	16 Nov 2010 06:38:20	31.64544833	-23.21657833
Fire	16 Nov 2010 07:44:55	31.70173	-23.39754
Fire	16 Nov 2010 05:17:39	31.73979667	-23.39336
Fire	17 Nov 2010 08:20:31	31.67272333	-23.29533167
Fire	17 Nov 2010 08:23:56	31.703605	-23.35028333
Fire	17 Nov 2010 08:53:15	31.89512167	-23.37565167
Fire	17 Nov 2010 09:11:44	31.84075	-23.30960167
Fire	17 Nov 2010 06:27:00	31.56273333	-23.210535
Fire	17 Nov 2010 06:32:29	31.52832	-23.07084167
Fire	17 Nov 2010 06:43:06	31.55838333	-23.074855
Fire	17 Nov 2010 07:42:30	31.59389	-23.16656167
Fire	17 Nov 2010 01:01:30	31.51248167	-23.01359
Fire	17 Nov 2010 01:11:42	31.43511167	-22.78694667
Fire	17 Nov 2010 01:27:55	31.34178667	-22.51110167
Fire	17 Nov 2010 01:36:39	31.37976667	-22.43463333
Fire	17 Nov 2010 02:58:25	31.78446	-22.78045833
Fire	17 Nov 2010 03:06:06	31.715885	-22.93332167
Fire	11/18/2010 3:16	31.93559473	-23.03413242

Water



0 20 40 60 80 100 120 Kilometers

BIRDS

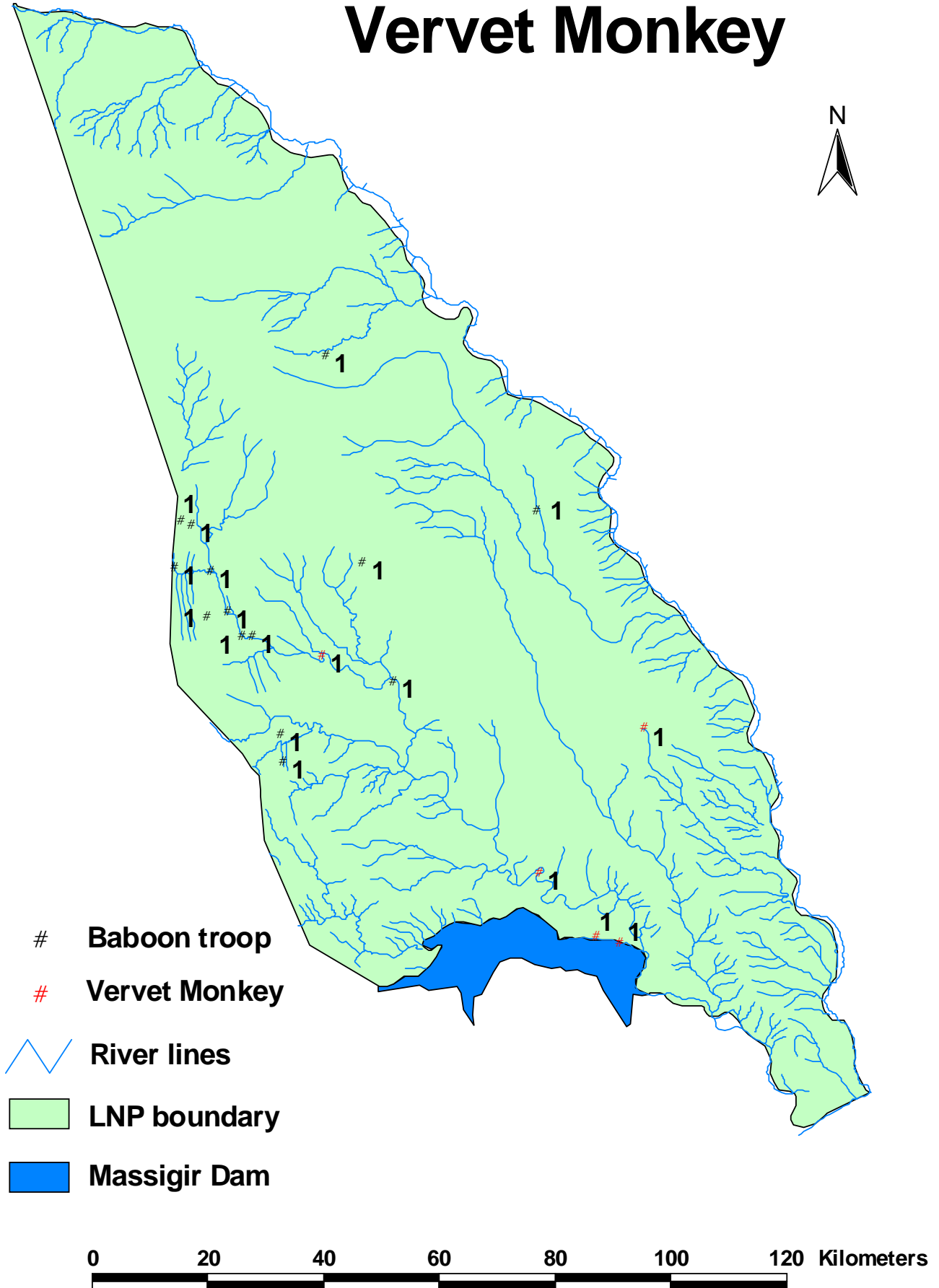
Detailed Ground Hornbill Sighting and Vulture Nest 12th to 19th of November 2010

Species	date and time	longitude	latitude	Number
Ground Horbill	12 Nov 2010 05:33:39	32.34217833	-23.56583	4
Ground Horbill	13 Nov 2010 01:59:15	31.86556	-23.73786333	5
Ground Horbill	13 Nov 2010 03:54:35	31.92132167	-23.75648833	1
Ground Horbill	13 Nov 2010 04:08:36	31.91203167	-23.80217667	3
Ground Horbill	13 Nov 2010 12:30:27	31.97776333	-23.65662167	3
Ground Horbill	14 Nov 2010 02:15:15	31.690765	-23.56983	4
Ground Horbill	14 Nov 2010 07:08:49	31.84067167	-23.91950667	3
Ground Horbill	14 Nov 2010 07:13:07	31.8738	-23.926345	1
Ground Horbill	14 Nov 2010 07:49:56	31.83350167	-23.85135833	2
Ground Horbill	14 Nov 2010 09:24:10	31.70518333	-23.688535	5
Ground Horbill	14 Nov 2010 11:40:14	31.865665	-23.60830167	1
Ground Horbill	14 Nov 2010 12:33:12	31.81358833	-23.56164667	3
Ground Horbill	16 Nov 2010 07:44:15	31.69020167	-23.399545	2
Ground Horbill	16 Nov 2010 09:35:16	31.56906333	-23.25356167	3
Ground Horbill	16 Nov 2010 11:27:50	31.64290833	-23.449565	4
Ground Horbill	17 Nov 2010 08:37:02	31.73927333	-23.34778833	3
Ground Horbill	17 Nov 2010 06:40:54	31.54974167	-23.09424	3
Ground Horbill	17 Nov 2010 07:38:50	31.57070167	-23.16734167	2
Ground Horbill	11/18/2010 13:39	31.78959564	-22.96368261	2
Ground Horbill	11/19/2010 7:59	31.78944435	-23.03045905	1
Ground Horbill	11/19/2010 9:02	32.18706138	-23.51136563	4
Ground Horbill	11/19/2010 13:29	32.19319317	-23.6284661	2

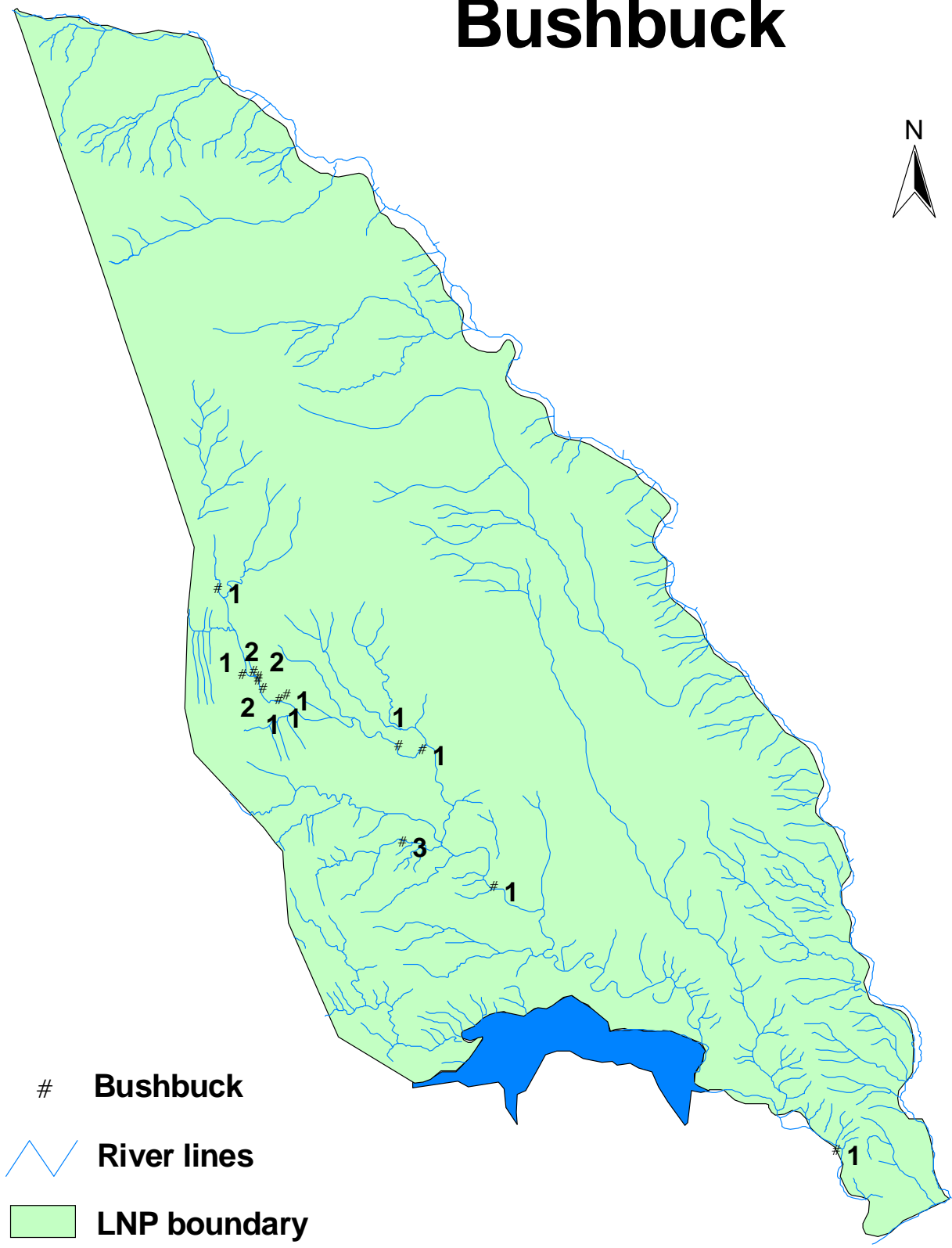
Species	date and time	longitude	latitude	Number
Vulture Nest	12 Nov 2010 09:42:03	32.26187833	-23.81830167	1
Vulture Nest	12 Nov 2010 11:19:17	32.31766833	-23.731345	1
Vulture Nest	17 Nov 2010 12:58:29	31.540415	-23.08793667	1
Vulture Lappetface	17 Nov 2010 09:28:19	31.81091667	-23.27814167	1


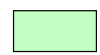

OTHER SPECIES

Baboon troop Vervet Monkey



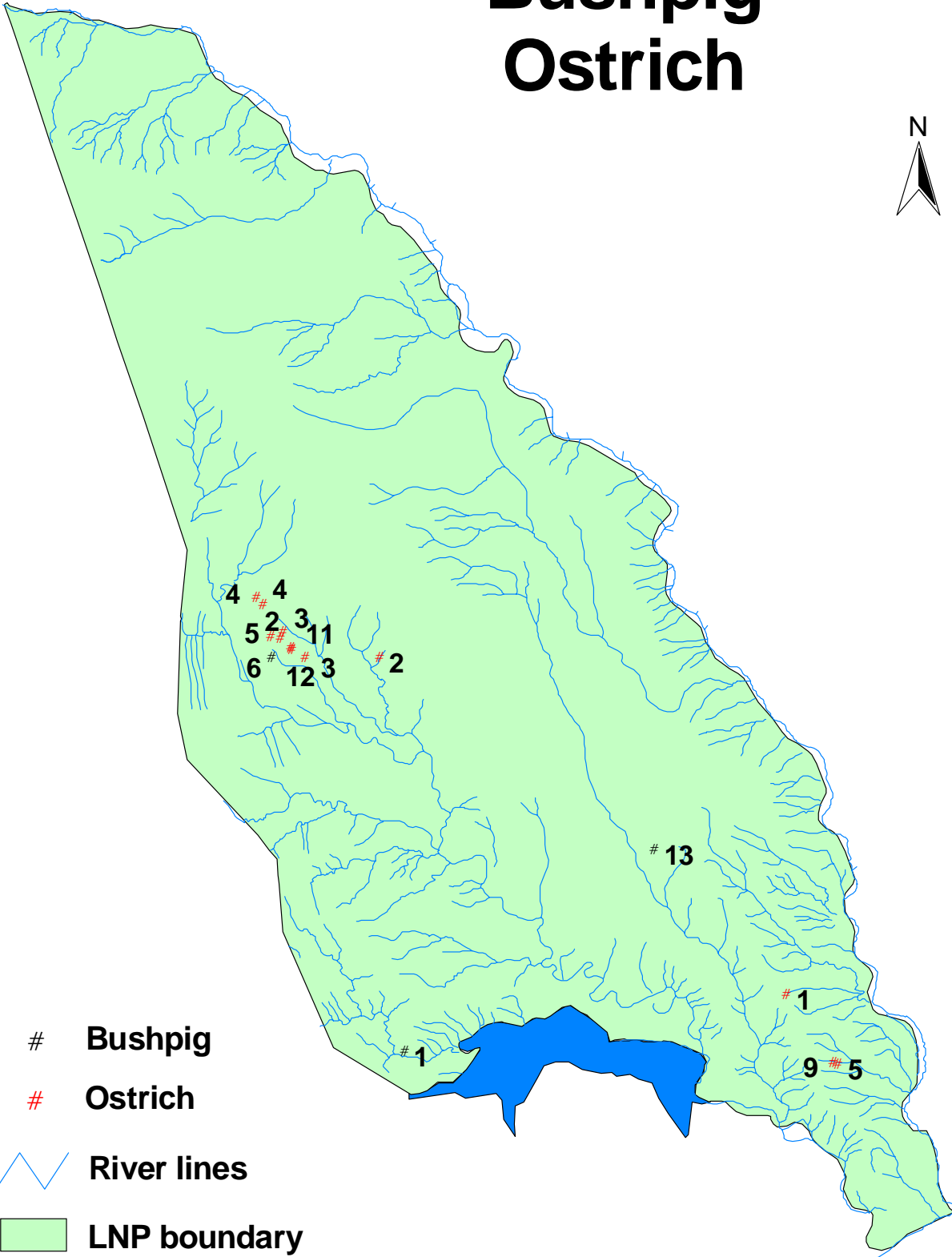
Bushbuck



- # Bushbuck
-  River lines
-  LNP boundary
-  Massigir Dam



Bushpig Ostrich



Bushpig

Ostrich

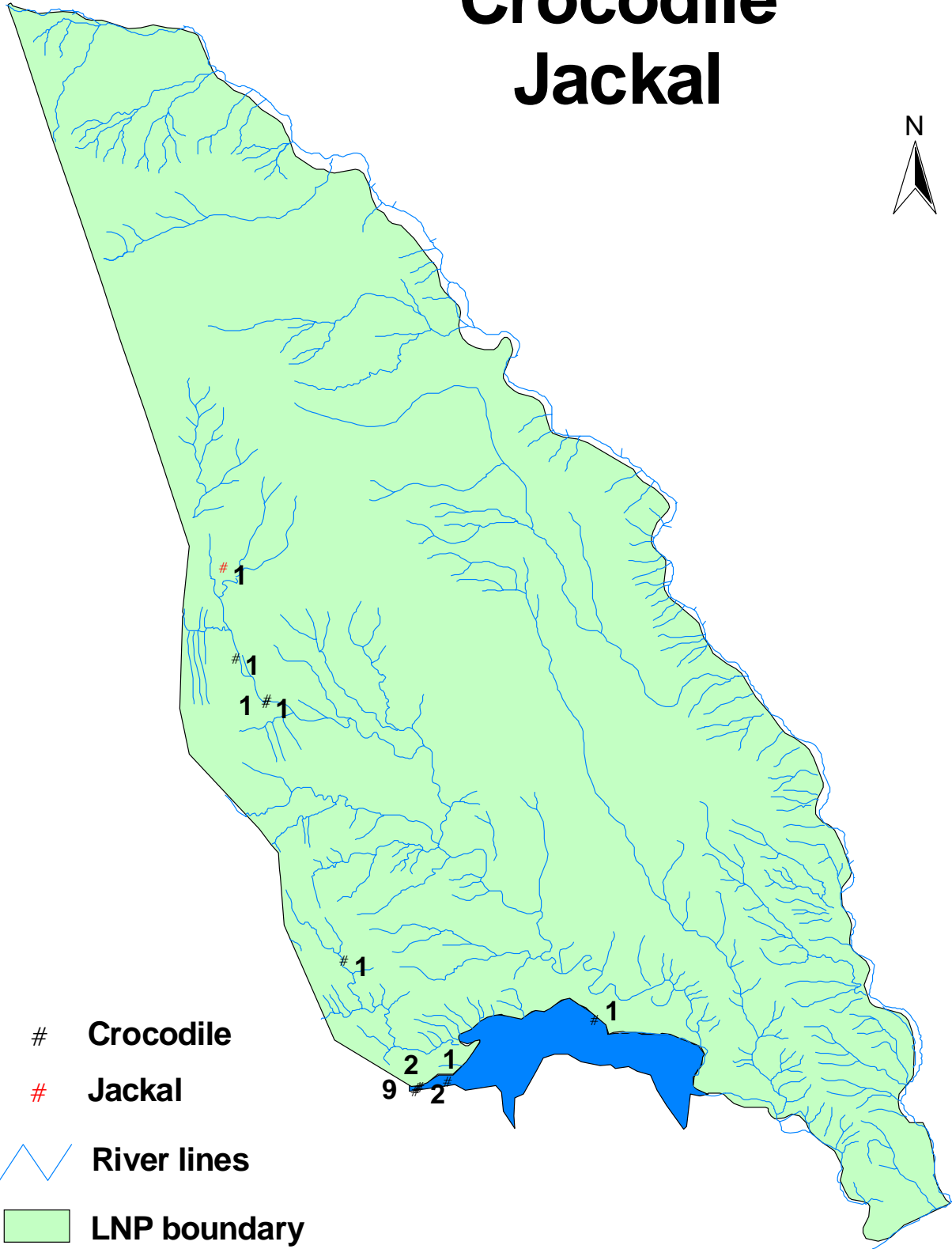
~ River lines

■ LNP boundary

■ Massigir Dam

0 20 40 60 80 100 120 Kilometers

Crocodile Jackal



Crocodile

Jackal

 River lines

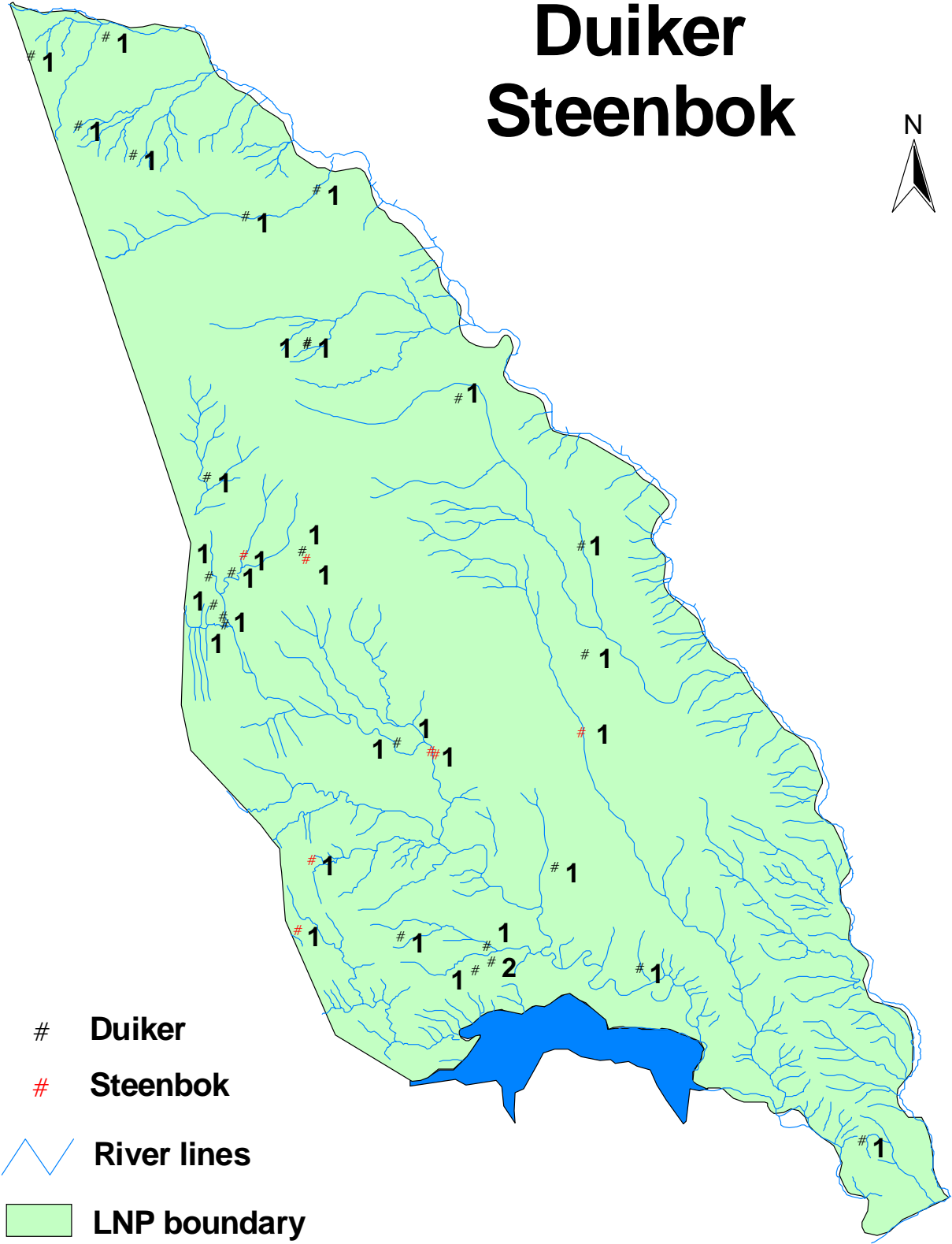
 LNP boundary



 Massigir Dam

0 20 40 60 80 100 120 Kilometers



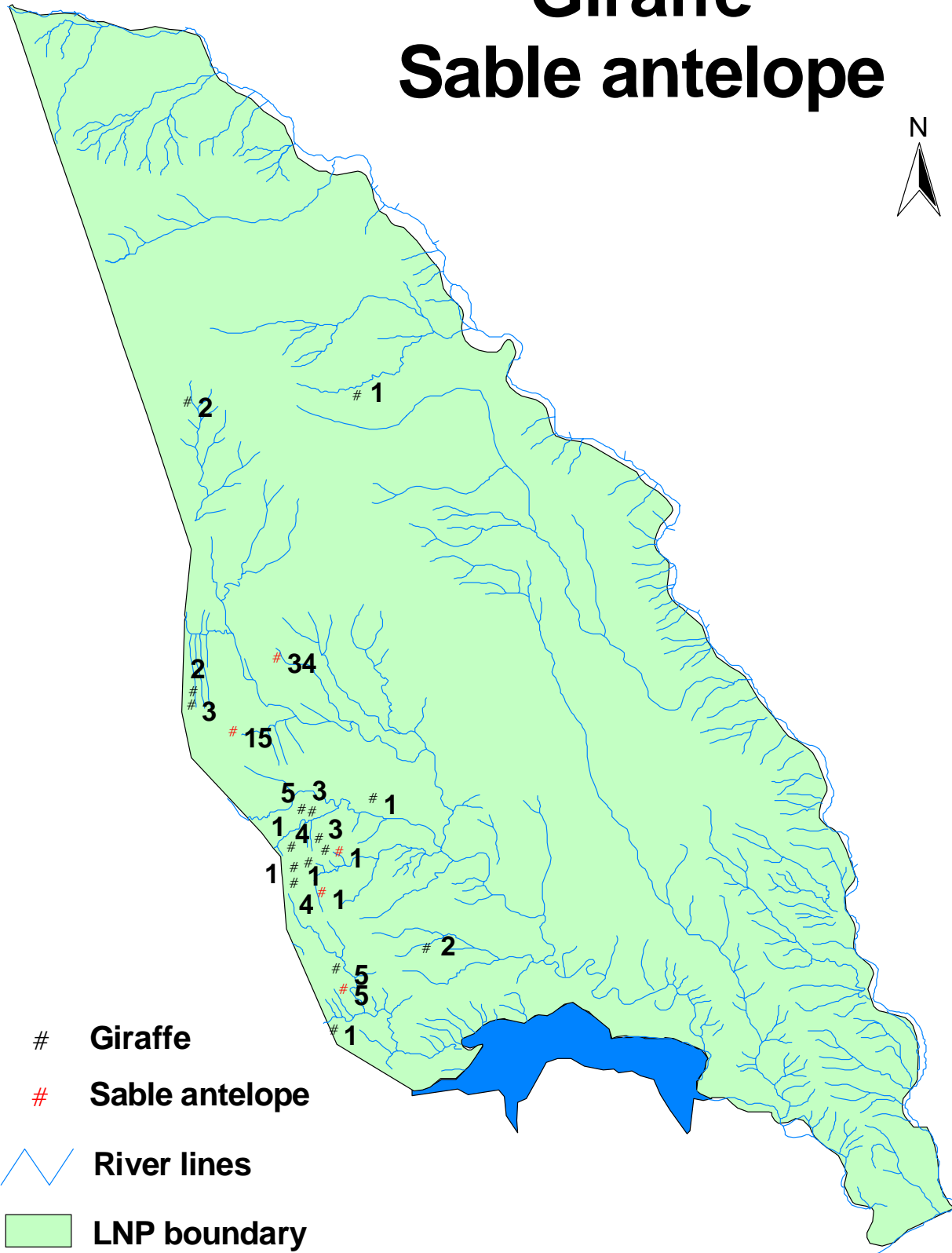
Duiker Steenbok



- # Duiker
- # Steenbok
-  River lines
-  LNP boundary
-  Massigir Dam



Giraffe Sable antelope



- # Giraffe
- # Sable antelope

 River lines

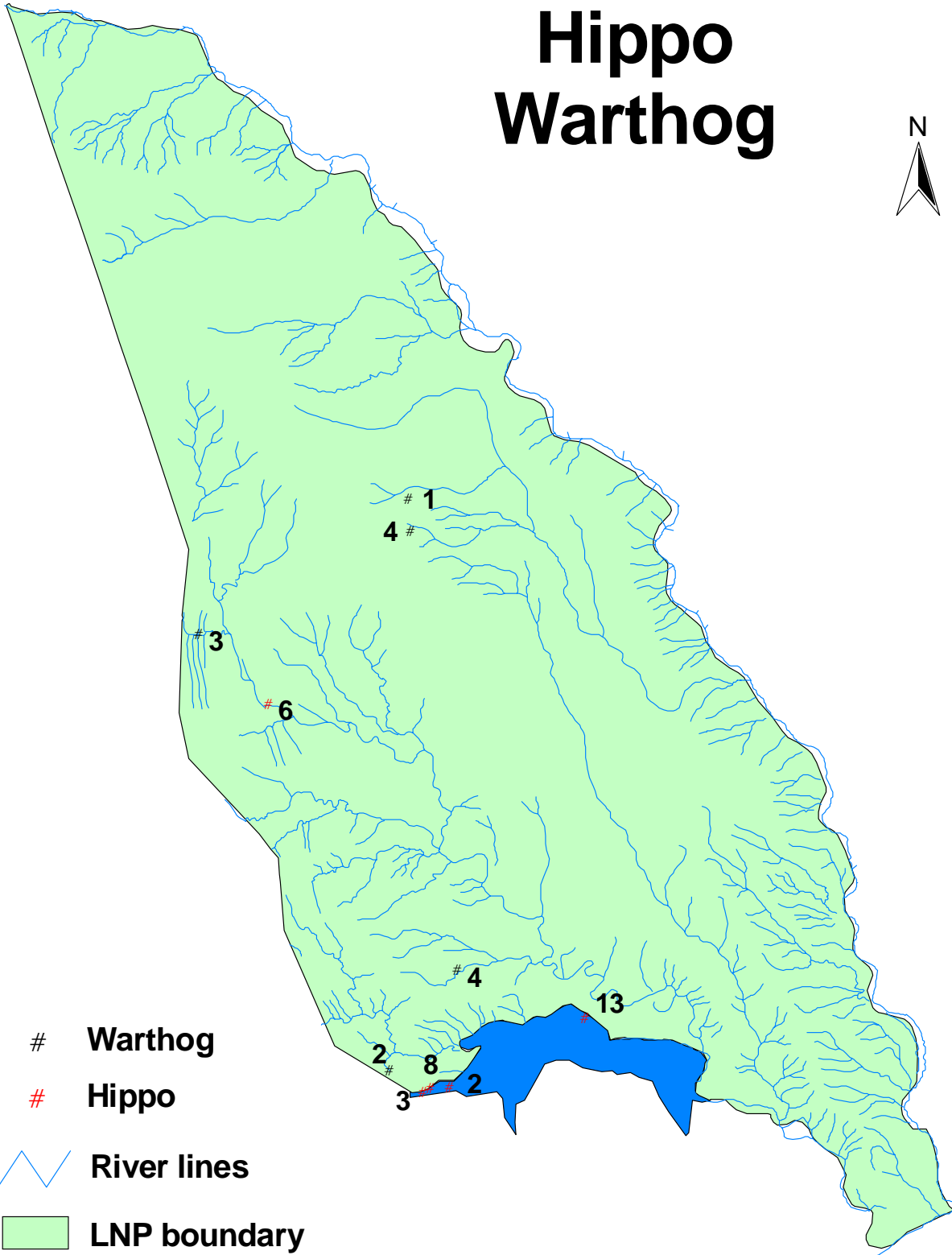
 LNP boundary

 Massigir Dam

0 20 40 60 80 100 120 Kilometers



Hippo Warthog



Warthog

Hippo

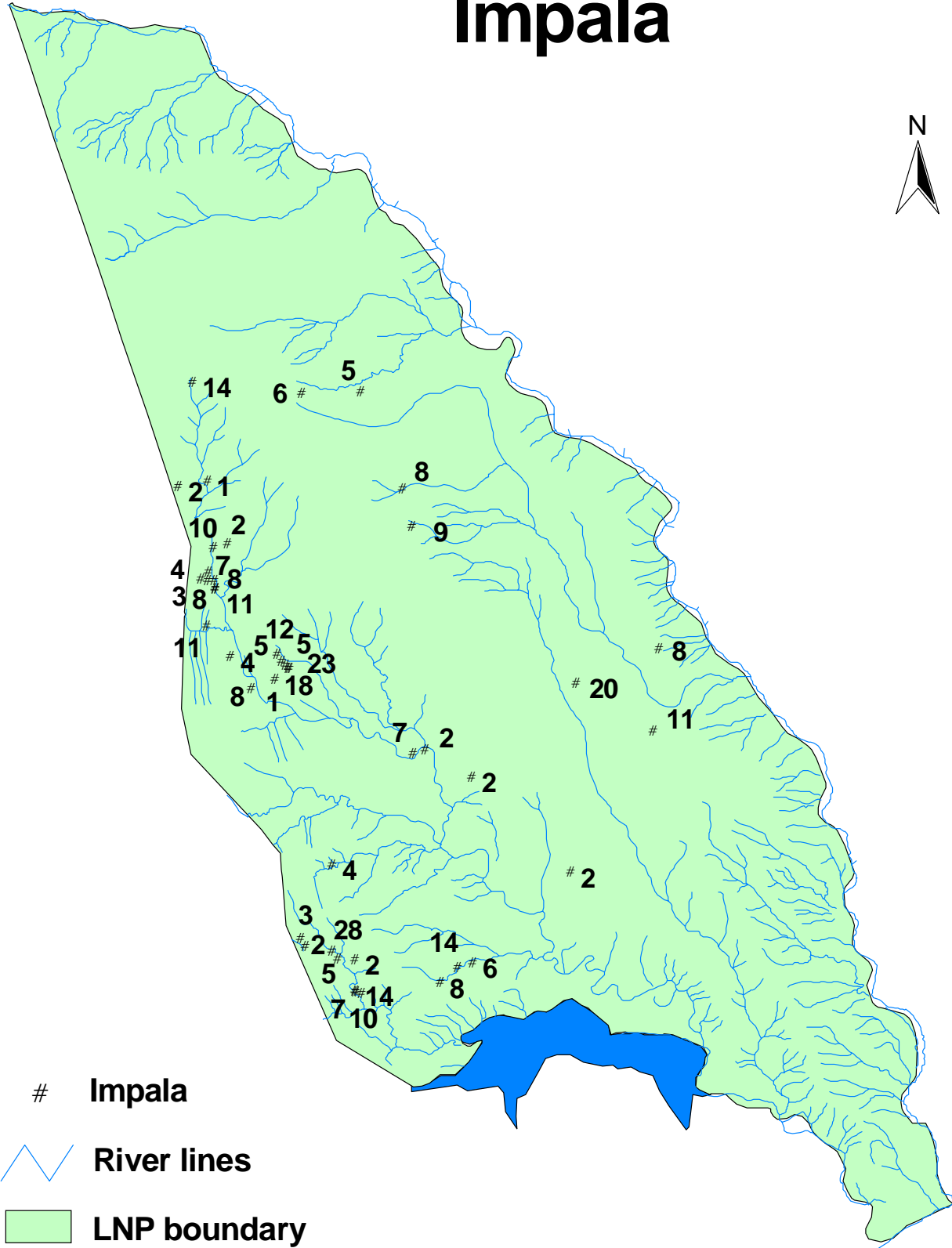
 River lines




 LNP boundary

 Massigir Dam



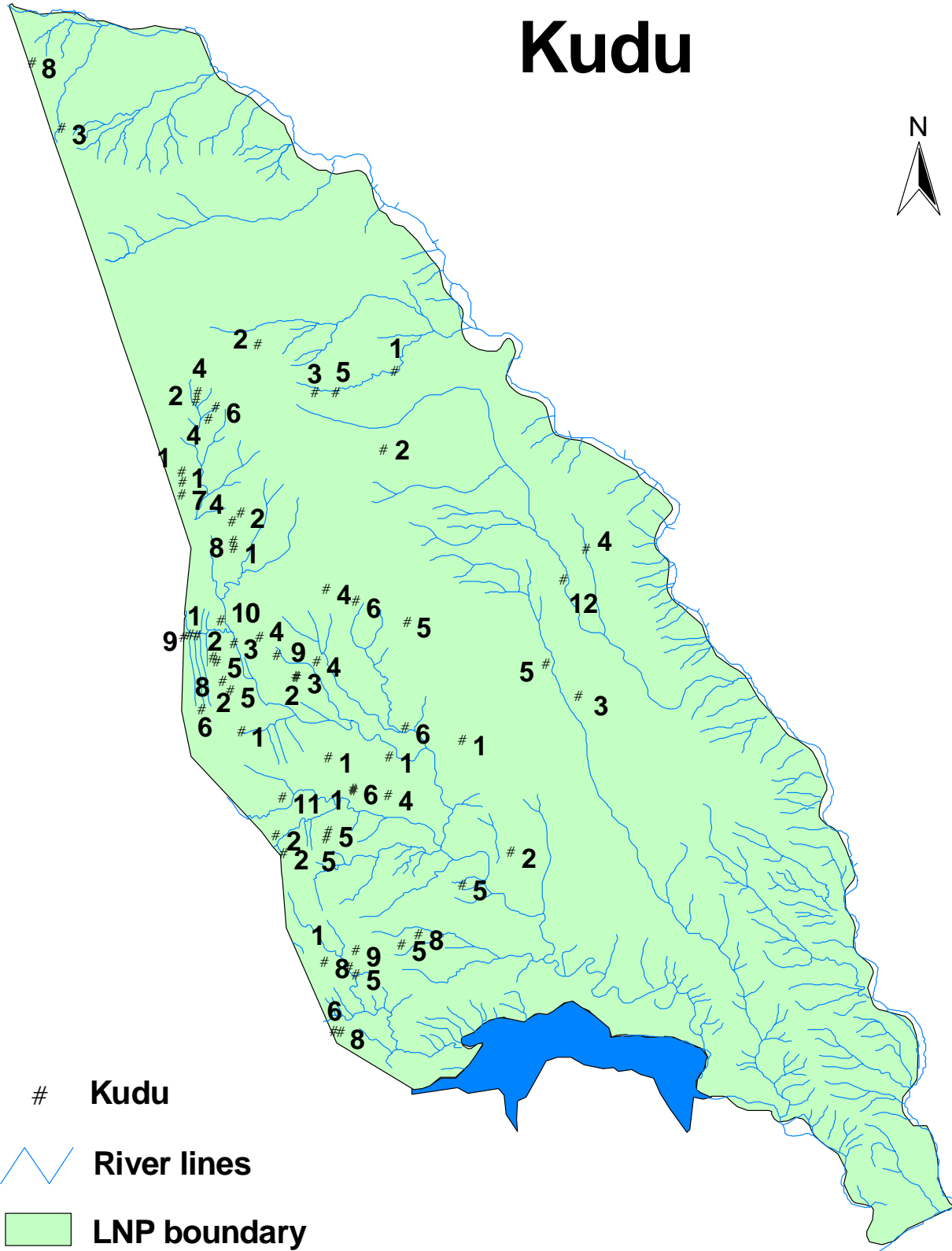
Impala



- # Impala
-  River lines
-  LNP boundary
-  Massigir Dam



Kudu




Kudu

 River lines

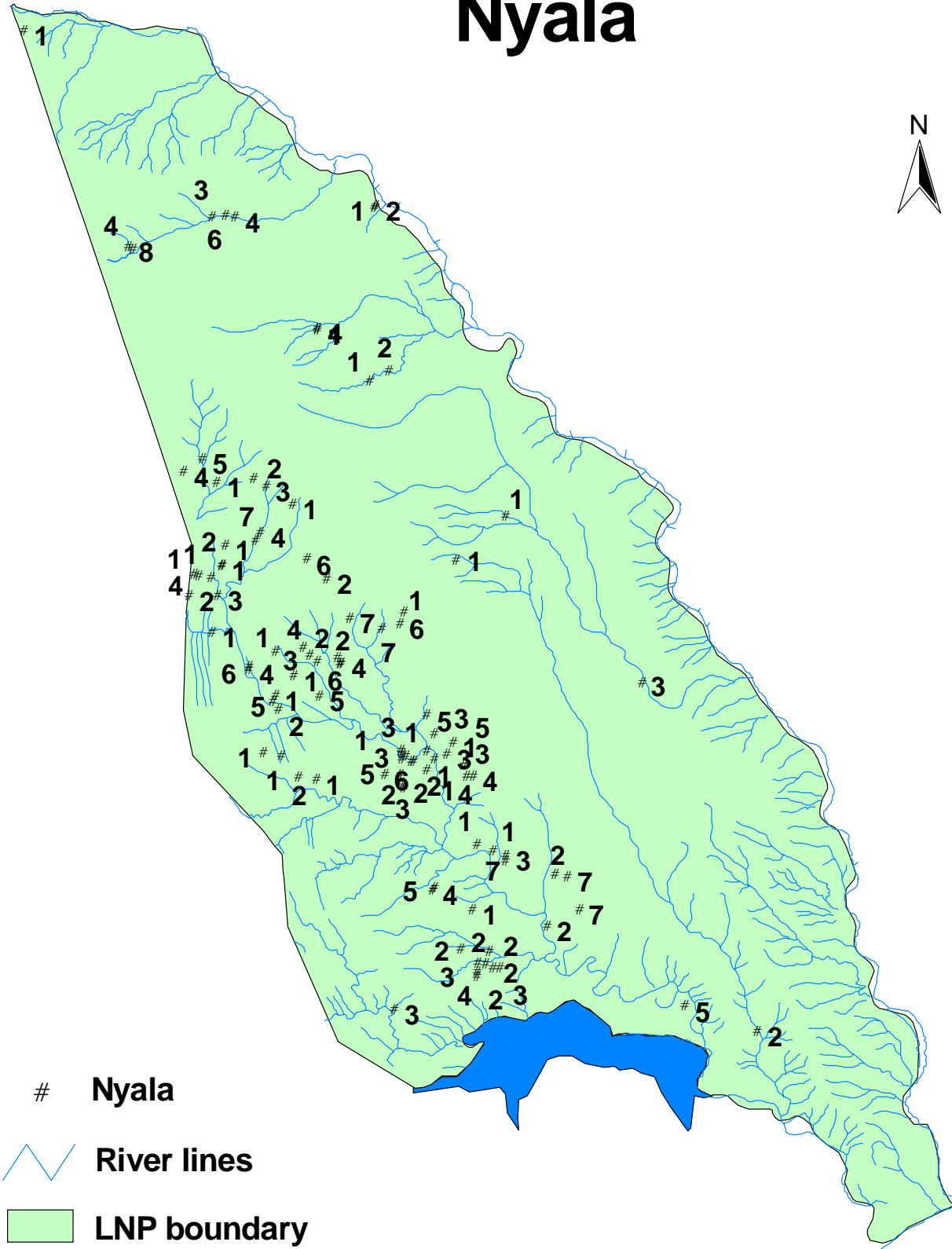
 LNP boundary

 Massigir Dam

0 20 40 60 80 100 120 Kilometers



Nyala



Nyala

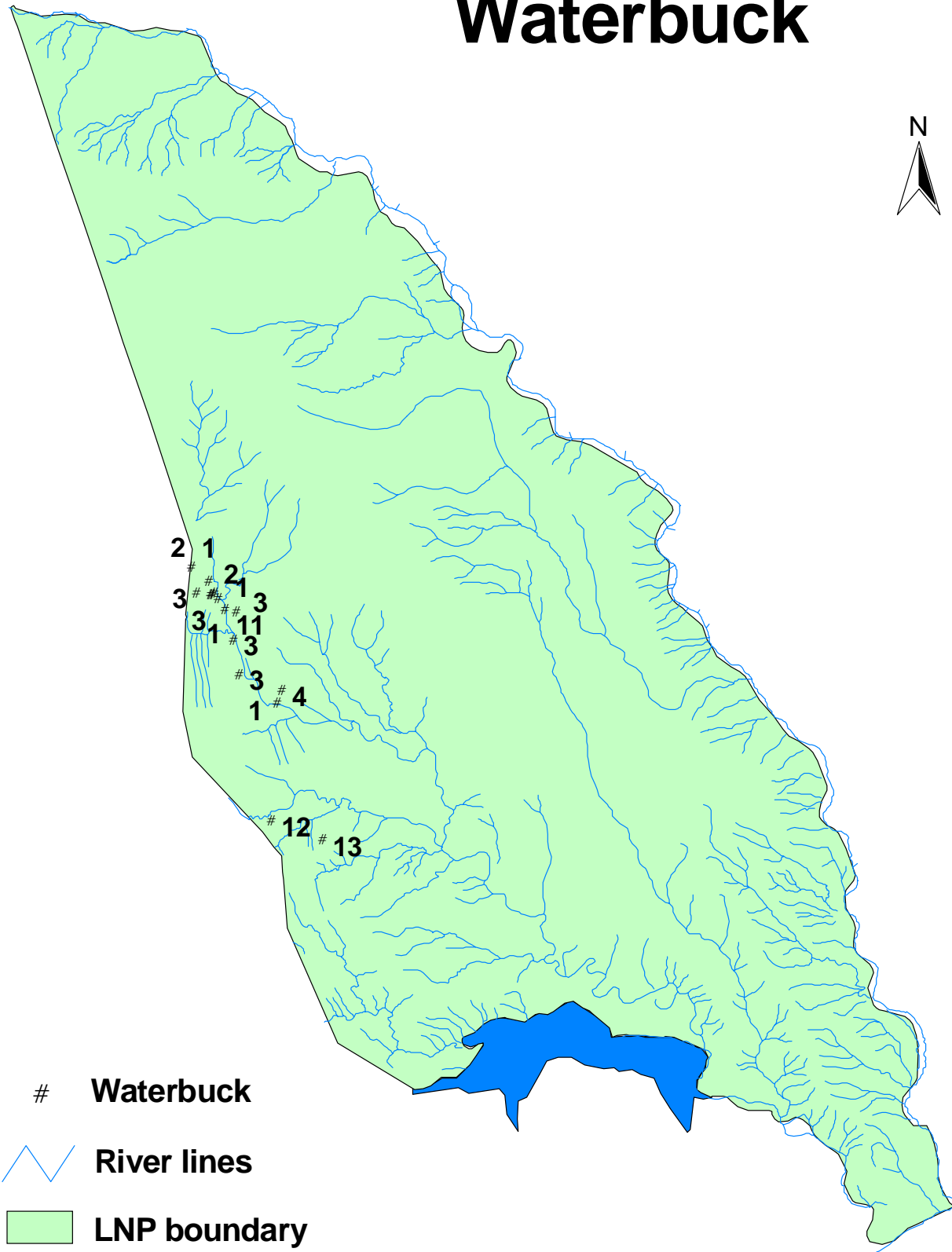
~ River lines

■ LNP boundary

■ Massigir Dam

0 20 40 60 80 100 120 Kilometers

Waterbuck



Waterbuck

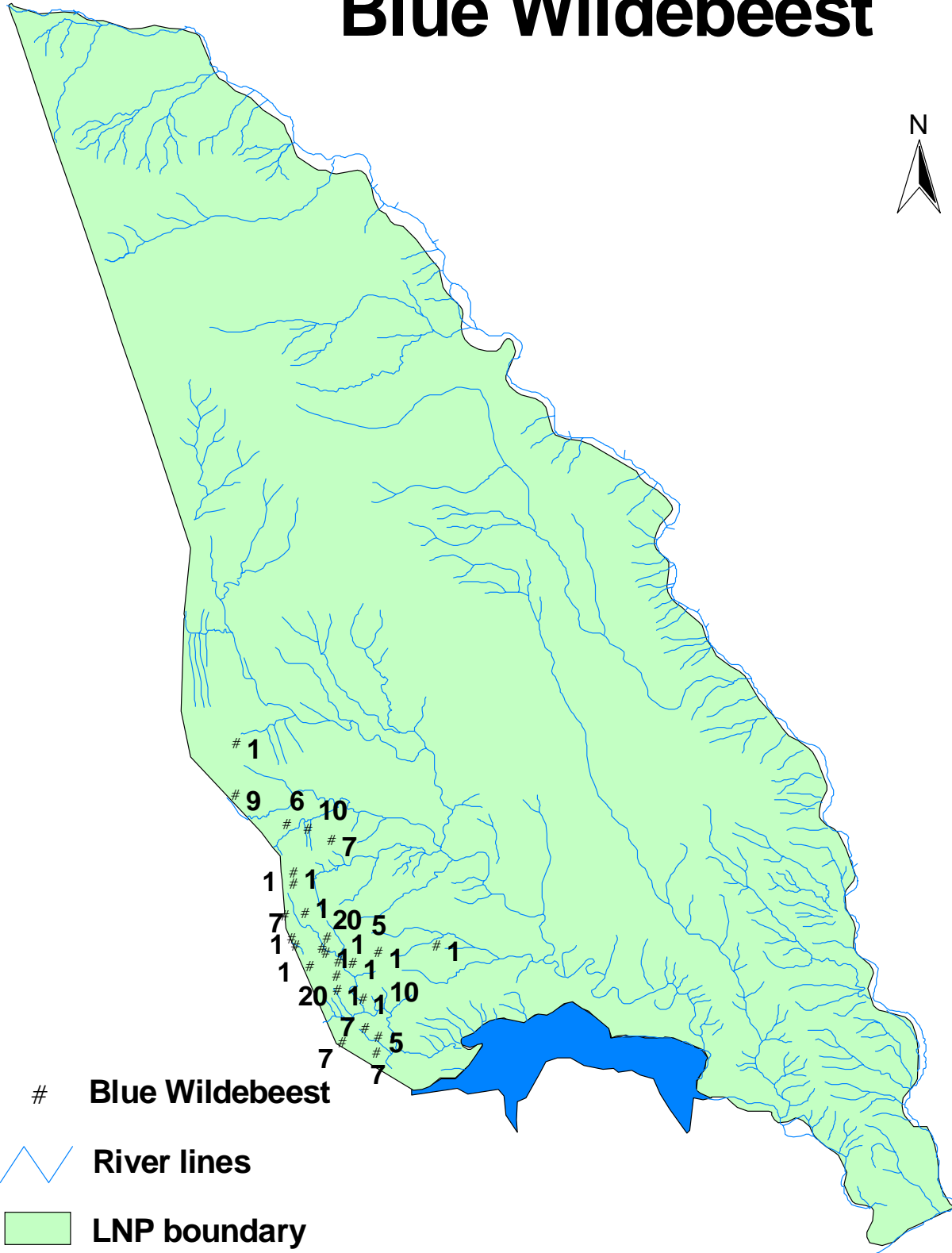
— River lines

■ LNP boundary

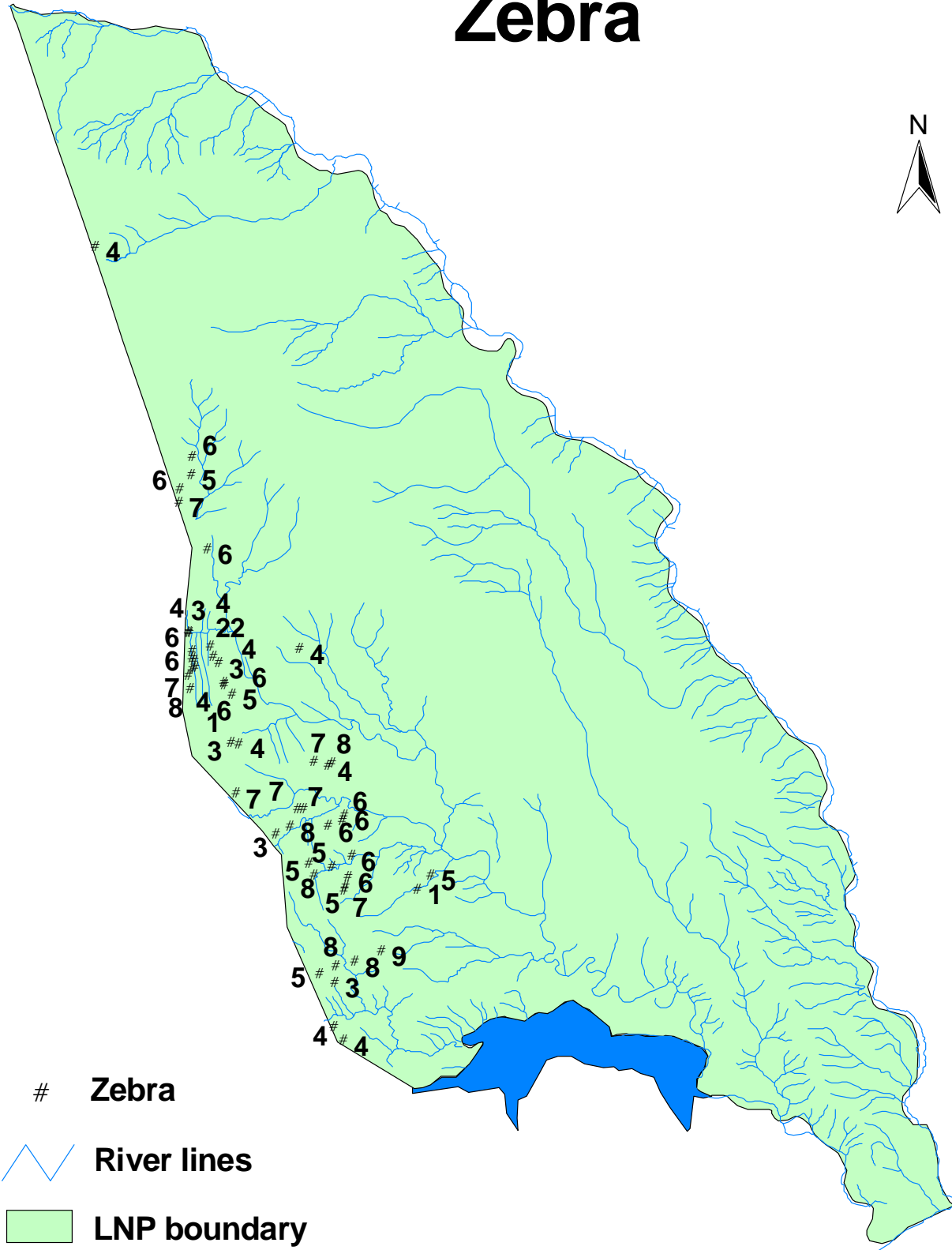
■ Massigir Dam

0 20 40 60 80 100 120 Kilometers

Blue Wildebeest



Zebra



Zebra

 River lines

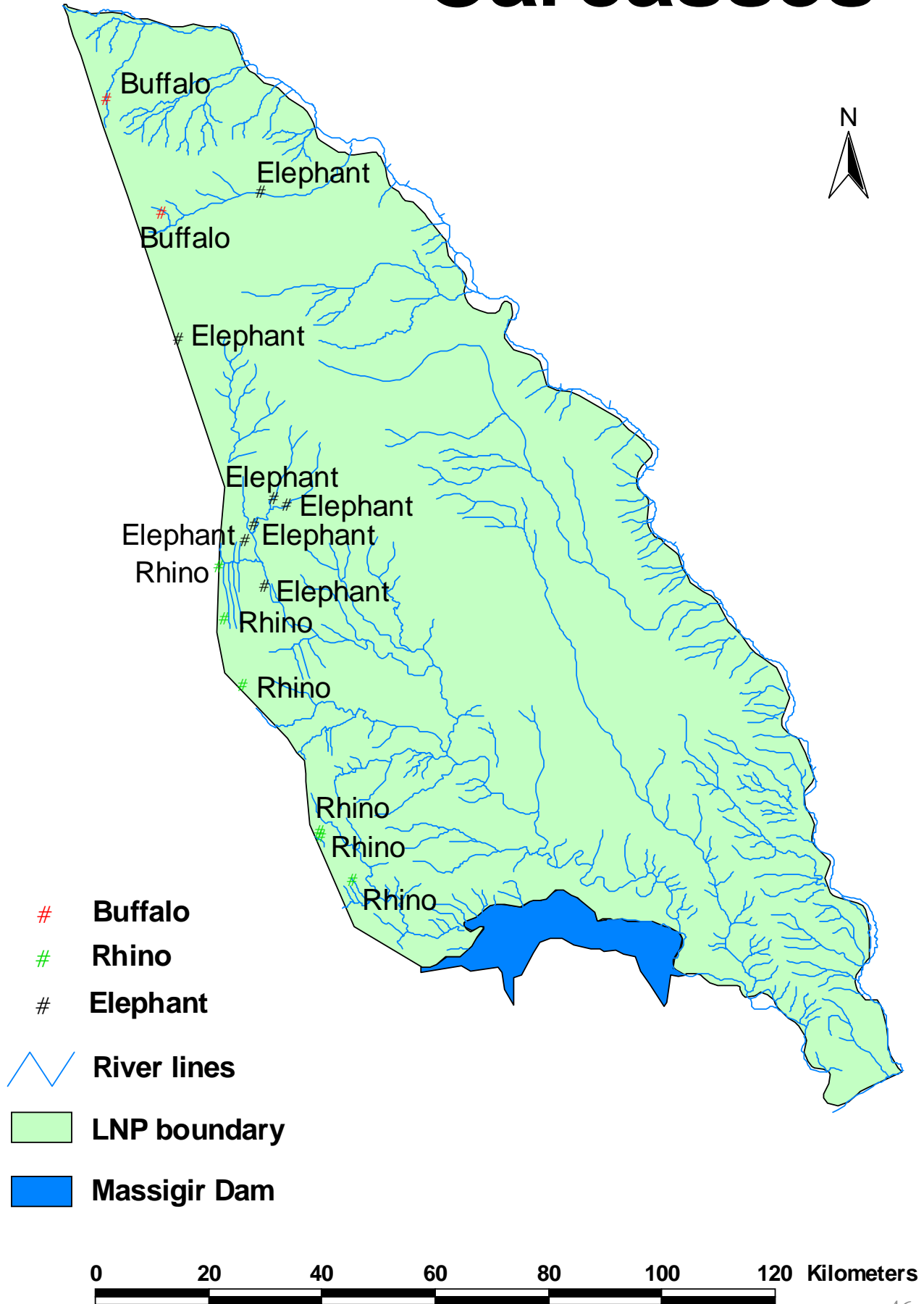
 LNP boundary

 Massigir Dam



CARCASS

Carcasses



Detailed Carcass Sighting

14th, 16th, 17th of November 2010

Species	date and time	longitude	latitude	Carcass
Buffalo	17 Nov 2010 01:50:54	31.37532667	-22.57458833	1
Buffalo	17 Nov 2010 02:33:16	31.46135667	-22.75442167	1
Elephant	16 Nov 2010 06:24:20	31.60911667	-23.24922	1
Elephant	16 Nov 2010 06:56:29	31.664435	-23.21884333	1
Elephant	16 Nov 2010 07:13:51	31.628475	-23.34543167	1
Elephant	16 Nov 2010 09:45:51	31.59622333	-23.27160333	1
Elephant	17 Nov 2010 01:04:37	31.48944167	-22.95161167	1
Elephant	17 Nov 2010 02:41:46	31.62213	-22.7181	1
Elephant	17 Nov 2010 03:21:00	31.63968	-23.20445667	1
Rhino White	14 Nov 2010 08:04:40	31.76512833	-23.811155	1
Rhino White	14 Nov 2010 09:12:02	31.71239333	-23.73459667	1
Rhino White	14 Nov 2010 09:13:57	31.71561333	-23.74088	1
Rhino White	16 Nov 2010 09:53:29	31.55349667	-23.3136	1
Rhino White	16 Nov 2010 10:10:40	31.56005	-23.39509667	1
Rhino White	16 Nov 2010 10:20:58	31.59084167	-23.50091333	1