GAME COUNTS IN NORTH-WEST NAMIBIA

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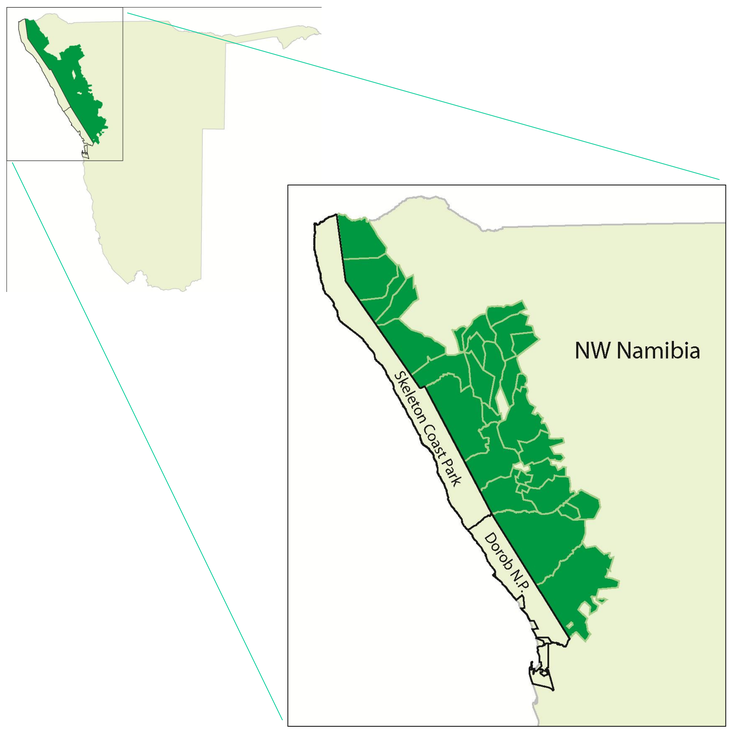
Implemented by NACSO, a partnership between Namibian NGO's and Government



Methodology

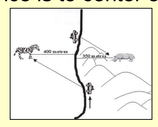
OBJECTIVES OF COUNTING

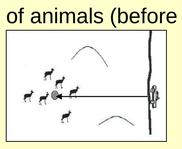
Objective	Reasons why information is needed
1. Estimate the Numbers of game **How many?**	For: • setting reasonable hunting/capture quotas; • estimating stocking rates to manage competition with livestock and protect veld; • determining the value of wildlife in the Conservancy.
2. Produce Game Distribution maps. **Where are they?**	For land-use planning (Zonation), it is important to identify areas of high game concentrations. Also to see how these distributions change in future years in reaction to rainfall or human factors such as water distribution or settlement .
3. Monitoring Population Change **Is wildlife increasing or decreasing?**	With successive censuses, graphs can be drawn showing population changes of each species (e.g. are springbok increasing or decreasing?). This will tell managers whether or not they are achieving their game management goals and consequently indicate if it is necessary to change management strategies.

FIELD RULES

For determining game NUMBERS

1. Centre line (the road and immediately next to the road) are priority areas for searching.
2. Distance must be to the animal before it runs away
3. Distance must be at right angles to the road
4. Distance is to center of groups of animals (before the group moves away)





5. Where the route travels next to a fence only the animals inside the fence are counted (the route distance is then halved for that section of the route)
6. Routes must represent all habitats proportionally (i.e. also count low density areas)
7. Only count adults and sub-adults - make a note of numbers of newly born juveniles (or newly hatched chicks – ostriches)

For TREND analysis, a number of additional rules were added:

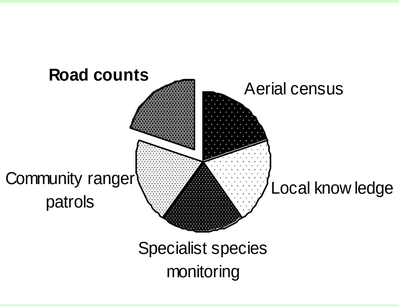
8. Fixed routes will be used for subsequent counts
9. Start time is at sunrise
10. No binoculars to be used (knowing that leads to underestimation of numbers)
11. Always count from the back of an open bakkie
12. Speed must never exceed 35 km/hr

For Game distributions, an additional rule was added:

13. Location of each sighting is mapped using the 2km x 2km grid map

METHODS

A vehicle-based road count method is being used. This method works well for common plains game but will not give good results for all species; especially smaller secretive animals, nocturnal animals, and animals in mountainous areas. Other monitoring methods (e.g. aerial census, foot patrols, specialist species monitoring) and local knowledge are also important. This means that the road counts will add value rather than replace these other methods – i.e. the methods all work together each providing a piece of the 'pie'.



The road-count has been designed so that local people can do this count with minimum outside assistance (e.g. borrowing a few vehicles with drivers once a year).

To achieve both local ownership and scientific accuracy, the road-count is conducted in a manner that allows the data to be analysed in two different ways:

1. The Field method provides a quick estimate of population numbers that is ideal for the Conservancies or concession holders and draws on Effective Strip Widths (ESWs) derived from DISTANCE © analysis.
2. Full Distance analysis takes more time and is done back in Windhoek when more statistically robust estimates are required for target areas.

The field approach is considered suitable for providing adequate local and regional estimates of game numbers at the time of the count

North -West Game Count 2002 — Conservancy: SESFONTEIN CMD

Date: 10-06-02 — Name of Patrol Route: GS1 — Observer/Span: JAN AWASEB — Start km: 234876 — End km: 234916

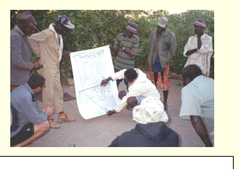
Start Locality: ROUTE 9 END POINT — End Location: GS1 END POINT — Start Time: 6H25 — End Time: 9H30 — 3 hr 05 min — Route length: 40 km

SPECIES	NUMBER Getal	DISTANCE from road	BLOCK Numbers East/Bo	BLOCK Numbers South/Onder	REMARKS
SPRINGBOK	1	300	607	712	✓
SPRINGBOK	1	200	607	712	✓
ZEBRAS	3	250	607	111	✓
GEMSBOKKE	16	100	607	111	Gemsbuck 44 ✓ 14✓
ZEBRAS	7	100	607	111	Ostrich 19 ✓ 4✓
SPRINGBOK	1	100	607	111	Springhaas 29 ✓ 1✓
OSTRICHES	8	300	606	111 ✓	Zebra 27 ✓ 7✓
ZEBRAS	4	400	606	111 ✓	119 ✓ 36
SPRINGBOK	1	500	606	111 ✓	

Example of a data sheet

Training using coloured tokens to represent animals

Routes, Zonation & Correction Factors



Each conservancy is divided up into count zones represented by routes. In addition, certain areas are excluded on the basis that no route adequately covers such terrain - i.e. no extrapolation is made to these areas

Transect statistics — #Khoadi //Hoas

Route	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Duration	2001	4.3	4.5	4.36												
	2002	4.07	4		3	4.3	4.5	4	4.25	3						
	2003	3.53	4	5.58	2.52	5.5	3.4	4.06	3.35	5.17						
	2004	4.24	5.25	4.75	3.25	3.5	4.5	3	4	3						
	2005	3.5	4.12	5.38	3.2	5.1	7.45	5.11	3.34	3.28						
	2006	4.1	4.5	5	3	6	5	3.5	4	2.7						
	2007	4	3.3	4.36	3.08	3.3	5.1	3.31	3	3.43						
	2008	4	3.32	4.5	3.3	4.11	5.15	4.22	2.4	3.42						
	2009	3.88	3.68	3.4	3	3	5.4	2.83	3.42	4						
	2010	4.7	5	3.5	2.45	4.72	5	5.5	4.25	3						
Length (km)	2001	58.5	49	48.3	38.5	61.5	42	47	36	69		41				
	2002	54.1	49	48	44	67	68	63	51	57						
	2003	52	49	48	47	67	63.1	60.7	46	57						
	2004	54	52	48	51	67	66.1	64	52	60						
	2005	52	50	48	48	75	59	63	46	59						
	2006	54	48	47	40	69	69	62	52	59						
	2007	51	50	48	47	65	71	62	44	59						
	2008	51	50	48	47	65	71	62	44	59						
	2009	53	47	47	47	66	65	62	45	59						
	2010	53	49	48	46	67	64	61	46	60						
Area (km2) Represented	2009	108	128	99	194	284	268	355	161	248						
Correction Factor — Expected:		2.04	2.72	2.11	4.13	4.3	4.12	5.73	3.58	4.2						
Used 2010:																

Divide the population estimate for each species by: 36.9 to get numbers per 5000 ha

Preliminary Results — THIS IS A DRAFT FIELD COPY — #Khoadi //Hoas — Count year: 2010

Numbers of animals seen

Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Baboon	26	39	25	42	54	34	77	57	79	83
Bat-eared Fox		4								
Cheetah				3					3	
Duiker						1				
Eland										
Elephant	12				9	1	13	13		7
Gemsbok	64	169	201	81	157	78	105	73	29	78
Giraffe	8	9	26	25	18	24	52	6	46	19
Hyaena										
Jackal	5	6	3	4	1	5	9	4	5	6
Klipspringer		9	7	2	6	3	6		2	9
Kudu	43	117	91	115	113	132	186	70	54	107
Ostrich	43	42	27	37	15	23	41	25	43	12
Rhino										
Springbok	120	118	291	620	120	213	1075	196	120	38
Steenbok		15	17	22	11	14	37	11	11	7
Warthog	3			1			4			
Zebra	40	57	93	32	47	27	190	43	3	28
No. of routes	3	9	9	9	9	9	9	9	9	9
Total kms	678	501	490	514	500	500	497	497	491	494

Preliminary population estimates

Species	Calculated population	Local estimate	Notes
Baboon			
Bat-eared Fox			
Cheetah			
Duiker			
Eland			
Elephant			
Gemsbok			
Giraffe			
Hyaena			
Jackal			
Klipspringer			
Kudu			
Ostrich			
Rhino			
Springbok			
Steenbok			
Warthog			
Zebra			

Rough field population estimates — Year: — Conservancy: #Khoadi //Hoas

Species	Route	1	2	3	4	5	6	7	8	9	10	11	12	Population Estimate X	Species C. Factor =	Population Estimate Using DISTANCE	Trends 2010	Trends 2009	Trends 3 Yr Mean	Local Estimate
	Route C. Factor	2.0	2.7	2.1	4.1	4.3	4.1	5.7	3.6	4.2				1 km belt transect						
Gemsbok															1.83		251	147		
Giraffe															2.45		131	332		
Klipspringer															7.48		270	54		
Kudu															2.47		629	366		
Ostrich															1.85		53	180		
Steenbok															10.55		396	421		
Zebra															1.60		85	13		
Duiker															9.00					
Springbok < 100 = number x R. C. F. ≥ 100 = number															2.42		158	1126		

add and divide by 3

Note:
- The route correction factor corrects for the total area represented by the transect (the stratum).
- The estimate using a 1km belt transect represents the lowest estimate for the species as it is based on the maximum effective detection width of 500 m either side of the transect line (i.e. the distance within which 96% of all game count sightings fall). To stop at this point would be to make the assumption that all animals within this strip are detected.
- As this is not a valid assumption, the species correction factor is used to increase the estimate using the effective strip width (ESW) calculated from DISTANCE for each species.

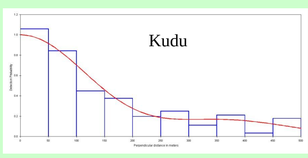
For Field Feedback — For advanced analysis only

From DISTANCE © analysis it was determined that transects represent a strip (belt) width of 500m on either side of the line.
Route correction factors are used to estimate numbers per count route zone. The sum of each zone estimate provides a minimum total estimate for each conservancy
Species correction factors are then used to take account in drop-off in detection of animals with distance from the transect line. These are calculated using DISTANCE © . Large groups are excluded from extrapolations and added later.

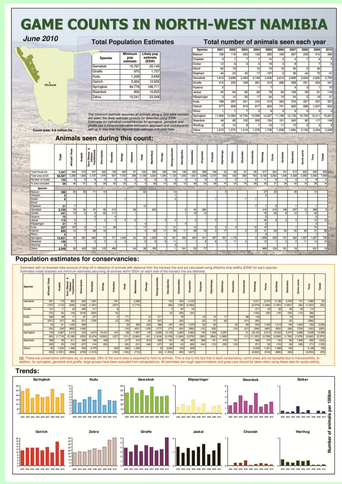
RESULTS

POPULATION ESTIMATES

Population estimates are determined from transect correction factors and discussed in the field immediately following each count.

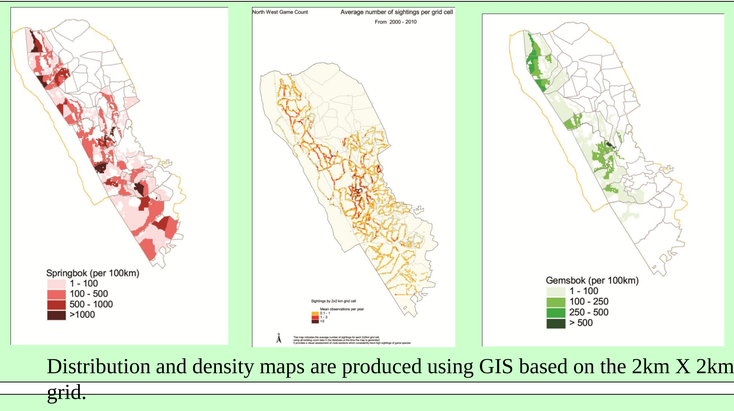


Sighting profiles in DISTANCE © analysis are used to estimate populations and to determine ESWs for use in the Field estimates method.



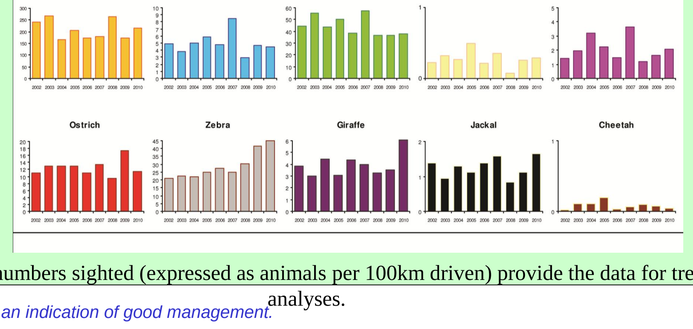
A summary poster is produced after each count and made widely available.

POPULATION DISTRIBUTION



Distribution and density maps are produced using GIS based on the 2km X 2km grid.

POPULATION TREND



The actual numbers sighted (expressed as animals per 100km driven) provide the data for trend analyses.

***Caution**: it is the activity rather than numbers which are the key as sustained droughts could have big impacts on numbers but as long as conservancies are monitoring it is an indication of good management.*