Qangwa Natural Resources Assessment System

INVENTORY OUTPUTS

Initial sampling exercise: 8 – 13 May, 2002

Compiled by: ACORD, Natural Resources Management Team

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Data analysis by: Michael Flyman

1. Quantitative descriptions

1.1 Density and frequency of woody species

1.1.1 Computation

Density and frequency data were compiled by sampling thirty 30 x 30 metre plots (total area = 2.7 hectares); the plots were located around the area called Qangwa which included the settlements of Qhooshe, Baate, Magopa and Dobe. Frequency is reported as the total number of sites (plots) within which a species was encountered, while density is number of trees per unit area. The following density values represent the total number of individuals across all the thirty sites divided by the total area sampled (2.7 hectares).

1.1.2 Results

	Local species name	Number of individuals	Number of occurrences (Frequency)	Density (trees/ha.)
1	Motsotsojane	301	26	111
2	Mogotlho	50	10	19
3	Moselesele	414	23	153
4	Mosu	27	4	10
5	Moretlwa	303	21	112
6	Motlopi	28	13	10
7	Mmilo/Mmupudu	29	3	11
8	Maphate	256	21	95
9	Mongana	199	13	74
10	Mokgwelekgwele	39	10	14
11	Moloto	104	12	39
12	Mogwana	151	13	56
13	Moretologa wa podi	31	6	11
14	Moretologa wa kgomo	9	5	3
15	Mokgalo	24	10	9
16	Qhae	15	7	6
17	Mothepa	1	1	0
18	Mohudiri	194	10	72
19	Njheka	14	6	5
20	Mogonono	876	22	324
21	Nqoodi/Monato	409	11	151
22	Mokabi	66	9	24
23	Seroka	217	20	80
24	Modubana	366	18	136
25	Morula	7	3	3
26	Mohahu	123	14	46
27	OKuyumba	5	2	2
28	Morobo	1	1	0
29	Mohata	32	7	12
30	Lebuta	372	7	138
31	Mojatlou/Mothwakeja	512	17	190
32	Motiwakatjipera	150	10	56
33	Mogokatau	86	10	32
34	Morupaphiri	83	18	31
35	XhaiXhadi	11	2	4

36	Xwii	17	4	6
37	Moologa	297	9	110
38	Mokolwane	19	3	7
39	Mothono	479	7	177
40	Tsaodi	2	1	1
41	Qhwaa	25	7	9
42	Motsiara	122	12	45
43	Molalakgaka	5	4	2
44	Lekwati	16	4	6
45	Xhara	8	5	3
46	Motswere	4	2	1
47	Mosheshe	103	10	38
48	monyelenyele	1	1	0
49	Mokwa	6	2	2
50	nqhoqwi	2	2	1
51	Mokamanawa	2	2	1
52	Mokwapi	2	1	1
53	Marago a Bahumagadi	7	4	3
54	moteya topa	1	1	0
55	Mondanda	63	12	23
56	Onjenje	7	3	3
57	Kgaba ya sekwena	39	3	14
58	xhwidwomaa	2	1	1
59	Mokgotshe	2	1	1
60	Motsweketsane	13	1	5
61	Monoga	1	1	0
62	lephuratshukudu	4	3	1
63	Nxabe	40	7	15
64	moumbajembu	13	1	5
65	monamaihi	2	1	1
66	mokgethashane	1	1	0
67	motareka	11	1	4
68	moparara	3	2	1

1.2 Importance Values of woody species

1.2.1 Computation

The density and frequency of each species are relativised by dividing them by the total value of each parameter, summed over all species. That is, Density values above are added up to give **2527.407**; frequency values add up to **504**. For each species, the density is divided by 2527.407 to give the Relative Density, while the frequency of each species is divided by 504 to give the Relative Frequency. The Importance Value (IV) is calculated by summing the Relative density and Relative frequency of each species.

1.2.1 Results

	Local species name	Relative density	Relative frequency	Importance Value (IV)
1	Mogonono	0.128	0.044	17.202
2	Mojatlou/Motlhwakeja	0.075	0.034	10.876

3	Moselese	0.061	0.046	10.630
4	Motsotsojane	0.044	0.052	9.570
5	Modubana	0.054	0.036	8.935
6	Moretlwa	0.044	0.042	8.607
7	Mothono	0.070	0.014	8.408
8	Nqoodi/Monato	0.060	0.022	8.176
9	Maphate	0.038	0.042	7.918
10	Seroka	0.032	0.040	7.148
11	Lebuta	0.055	0.014	6.840
12	Moologa	0.044	0.018	6.138
13	Mongana	0.029	0.026	5.496
14	Mohudiri	0.028	0.020	4.827
15	Mogwana	0.022	0.026	4.792
16	Morupaphiri	0.012	0.036	4.788
17	Mohahu	0.018	0.028	4.580
18	Motiwakatjipera	0.022	0.020	4.182
19	Motsiara	0.018	0.024	4.169
20	Moloto	0.015	0.024	3.905
21	Mosheshe	0.015	0.020	3.494
22	Mondanda	0.009	0.024	3.304
23	Mogokatau	0.013	0.020	3.244
24	Motlopi	0.004	0.026	2.990
25	Mokabi	0.010	0.018	2.753
26	Mogotlho	0.007	0.020	2.717
27	Mokgwelekgwele	0.006	0.020	2.556
28	Mokgalo	0.004	0.020	2.336
29	Nxabe	0.006	0.014	1.975
30	Mohata	0.005	0.014	1.858
31	Qhwaa	0.004	0.014	1.755
32	Moretologa wa podi	0.005	0.012	1.645
33	Qhae	0.002	0.014	1.609
34	Njheka	0.002	0.012	1.396
35	Mosu	0.004	0.008	1.189
36	Kgaba ya sekwena	0.006	0.006	1.167
37	Moretologa wa kgomo	0.001	0.010	1.124
38	Xhara	0.001	0.010	1.109
39	Xwii	0.002	0.008	1.043
40	Lekwati	0.002	0.008	1.028
41	Mmilo/Mmupudu	0.004	0.006	1.020
42	Marago a Bahumagadi	0.001	0.008	0.896
43	Mokolwane	0.003	0.006	0.874
44	Molalakgaka	0.001	0.008	0.867
45	Onjenje	0.001	0.006	0.698
46	Morula	0.001	0.006	0.698
47	Lephuratshukudu	0.001	0.006	0.654
48	XhaiXhadi	0.002	0.004	0.558
49	Mokwa	0.001	0.004	0.485
50	Okuyumba	0.001	0.004	0.470
51	Motswere	0.001	0.004	0.455
52	Moparara	0.000	0.004	0.441
53	Nqhoqwi	0.000	0.004	0.426

54	Mokamanawa	0.000	0.004	0.426
55	Motsweketsane	0.002	0.002	0.389
56	Moumbajembu	0.002	0.002	0.389
57	Motareka	0.002	0.002	0.360
58	Monamaihi	0.000	0.002	0.228
59	Tsaodi	0.000	0.002	0.228
60	Xhwidwomaa	0.000	0.002	0.228
61	Mokwapi	0.000	0.002	0.228
62	Mokgotshe	0.000	0.002	0.228
63	Mokgethashane	0.000	0.002	0.213
64	Monyelenyele	0.000	0.002	0.213
65	Moteya topa	0.000	0.002	0.213
66	Monoga	0.000	0.002	0.213
67	Mothepa	0.000	0.002	0.213
68	Morobo	0.000	0.002	0.213

1.2.2 Interpretation

The higher the IV the more dominant the species is within the study area. It is an index, which is derived to account for the fact that ecological importance does not only depend on numerical abundance. Rather, ecological importance (dominance) is a function of how much of a resource is available as well as how evenly distributed it is within the area of interest.

1.3 Frequency of non-woody species

1.3.1 Computation

The % Frequency was calculated by dividing the number of occurrences of each species by 30 (total number of sites) and multiplying by 100.

1.3.2 Results

	Local species name	Number of occurrences	% Frequency
1	tshwaa/ngomba/boditse ja tau	25	83.33
2	seriri sa tau/qaaha/onjiseyongeyama	24	80.00
3	hoke/seloka/mogatla wa peba	23	76.67
4	oukwiya/nxao	19	63.33
5	Vishandoko	17	56.67
6	Phoka	17	56.67
7	bojang ja pitse 1/xweixisi	17	56.67
8	Chobachobane	16	53.33
9	motioshejumba/molemo wa malaria	14	46.67
10	Mogau	13	43.33
11	motlhanka wa shata	12	40.00
12	phoka ya motlhaba/haahaa/sanyane	11	36.67
13	Nqobuzwa	11	36.67
14	outhwi/ moshigaapoo	11	36.67
15	bojang ja kukama	10	33.33
16	tholwatholwana/mantjiarara	10	33.33
17	bogama/tjiramata	10	33.33
18	Rukute	9	30.00

19	molora/monamakia	8	26.67
20	motjiraanduno/mogatla wa kukama	7	23.33
21	mojaphofu/mophofu	7	23.33
22	Tshikadithata	7	23.33
23	Bojang jwa Tau	6	20.00
24	Lotsane	5	16.67
25	Ruthenga	5	16.67
26	Mosetlho	5	16.67
27	Winya	5	16.67
28	molemo wa nonyane/otubahone	5	16.67
29	Motswaitswai	5	16.67
30	Haobebe	5	16.67
31	motlhanka wa phoka/ngarara	4	13.33
32	Ookuya	4	13.33
33	kgaba e e mashi	4	13.33
34	Legongnyana	4	13.33
35	Motlhagasedi	4	13.33
36	Rune	4	13.33
37	motlhanka wa petition	4	13.33
38	kaitswa (kadli)	4	13.33
39	kaitswa(xamhu, dao, rupapa/morokolodi)	4	13.33
40	bojang ja pitse 2	4	13.33
41	Kgaba	4	13.33
42	Morondi	4	13.33
43	Nqooni	4	13.33
44	Motsikiri	3	10.00
45	Tshikitshane	3	10.00
46	masepa a banyana	3	10.00
47	Oupatuke	3	10.00
48	molekantsi/ kashondemba	3	10.00
49	Petition	3	10.00
50	mosetlha/movahe	3	10.00
51	ditedu tsa banna	3	10.00
52	Tlhogotshweu	3	10.00
53	Ntshe	3	10.00
54	Motsokotsane	2	6.67
55	Nyeva	2	6.67
56	Tundo	2	6.67
57	Xamxam	2	6.67
58	Karurutu	2	6.67
59	mokauru/ kauru	2	6.67
60	Monakaladi	2	6.67
61	Motioutheno	2	6.67
62	Gorotsho	2	6.67
63	Mopapi	2	6.67
64	Mouva	2	6.67
65	Monoka	2	6.67
66	Tlhogoyatau	2	6.67
67	petition ya motlhaba	2	6.67
68	motlhwa/ motlho	2	6.67
69	Qingqoma	2	6.67

70	Onyiya	2	6.67
71	Oruubanbanda	2	6.67
72	Lerusa	2	6.67
73	Ounya	2	6.67
74	matlhatsa a phofu	2	6.67
75	nyarayongeyama/dinala tsa tau	2	6.67
76	Mopepe	2	6.67
77	Mokapana	2	6.67
78	Kateeyandoombe	2	6.67
79	Mmaphofu	2	6.67
80	Oukuyona	2	6.67
81	Motiotjitombo	2	6.67
82	setlhare sa nta	1	3.33
83	Mosukutshwane	1	3.33
84	Mopamoke	1	3.33
85	tjiramata (male)	1	3.33
86	Magole a khudu	1	3.33
87	motlhanka wa mokamakama	1	3.33
88	Monokanavi	1	3.33
89	madiakgokong/ xaodi	1	3.33
90	Xadi	1	3.33
91	Xam	1	3.33
92	Nxixam	1	3.33
93	Xingxong	1	3.33
94	Kgophane	1	3.33
95	motshwara tlhako ya pitse	1	3.33
96	hothorangwana	1	3.33
97	hothorothuno	1	3.33
98	Hothokaanja	1	3.33
99	tjindaka o bethezu	1	3.33
100	tjiurutjongunya	1	3.33
101	Tjindondo	1	3.33
102	setlhabakolobe	1	3.33
103	Xhagadi	1	3.33
104	Nxabe	1	3.33
105	hothosekukutu	1	3.33
106	Qolo	1	3.33
107	Kanje	1	3.33
108	Tjihapandeko	1	3.33
109	Ngalabile	1	3.33
110	Sesepasepe	1	3.33
111	Vitherando	1	3.33
112	kaitswa ya diphofu	1	3.33
113	kaitswa ya motlhaba	1	3.33
114	Sandokose	1	3.33
115	Kangunya	1	3.33
116	Karurona	1	3.33
117	Tjiurungunya	1	3.33
118	Ngarabi	1	3.33
119	Guduro	1	3.33
120	Kgalegeta	1	3.33

121	Segabameno	1	3.33
122	Xixi	1	3.33
123	Qhowaa	1	3.33
124	oseolosengwenya	1	3.33
125	Thepe	1	3.33
126	Ngoma	1	3.33
127	loswe/nqhauwa	1	3.33
128	Shadaxho	1	3.33
129	masegomabe	1	3.33
130	Gudigajoo	1	3.33
131	hothokatherandu	1	3.33
132	Letswai la khudu	1	3.33
133	Sengamba	1	3.33
134	nxoodu (male)	1	3.33
135	Nquxi	1	3.33
136	Xhaidima	1	3.33
137	Nqashanse	1	3.33
138	Nxwaa	1	3.33
139	Xinxho (male)	1	3.33
140	kozo (Wayeyi)	1	3.33
141	Thangashaka	1	3.33
142	Sebaga	1	3.33
143	kgaba e nnye	1	3.33
144	kgaba e tona/qangi	1	3.33
145	kgaba ya badimo	1	3.33
146	Palamela	1	3.33
147	Lehubala/ lentxaka la phiri	1	3.33
148	Ndovi	1	3.33
149	Urau	1	3.33
150	Uruwhengwe	1	3.33
151	Qhara	1	3.33
152	Mbaruru	1	3.33
153	Mohakaurwa	1	3.33
154	Xhaasi	1	3.33
155	Mochamba	1	3.33
156	Monaguva	1	3.33
157	Monandovi	1	3.33
158	Uthondanga	1	3.33
159	Eyava	1	3.33
160	Ombawa	1	3.33
161	outhweregamba	1	3.33
162	Omainya	1	3.33
163	Oruotaote	1	3.33
164	Orumange	1	3.33
165	Ruinya	1	3.33
166	moumbirwa/xhau	1	3.33
167	Uthongiyama	1	3.33
168	Oulu	1	3.33
169	Otomba	1	3.33
170	Onyeba	1	3.33
171	Nyanga	1	3.33

172	Okakanyo	1	3.33
173	Upjwe	1	3.33
174	mositsana/monjwethe	1	3.33
175	Monyolo	1	3.33
176	Murumate	1	3.33
177	Mokute	1	3.33
178	Motiomatuta	1	3.33
179	Vishndoko ya motlhaba	1	3.33
180	Mwadikoyo	1	3.33
181	Setlhare sa botete	1	3.33
182	motiothombinda	1	3.33
183	motiothongangombe	1	3.33
184	Tjirumba	1	3.33
185	Oonyangiam	1	3.33
186	Xang	1	3.33
187	Vinamathwi	1	3.33
188	Onjiba	1	3.33
189	mothamisapelo	1	3.33
190	Ondorowa	1	3.33
191	Oyaebe	1	3.33
192	Ongambo	1	3.33
193	Onga	1	3.33
194	Tjethepa	1	3.33
195	umutioshitombo	1	3.33
196	Mogatla wa pitse	1	3.33
197	Mothuka	1	3.33
198	Moenya	1	3.33
199	Moronga	1	3.33
200	Mombu	1	3.33
201	Moumba	1	3.33
202	Mogotlha	1	3.33
203	Mopepura	1	3.33
204	Mwarikoyo	1	3.33
205	Motjirandono	1	3.33
206	Mohulatau	1	3.33
207	motiongorotima	1	3.33
208	Mopepere	1	3.33
209	Makarupi	1	3.33
210	mosimama (male)	1	3.33
211	Mosimama	1	3.33
212	Mokgotshe	1	3.33
213	Molora (male)	1	3.33
214	Mohulaphi	1	3.33
215	motjiraokakao/mogatla wa kgabo	1	3.33
216	Mokwaimbi	1	3.33
217	Mothepa	1	3.33
218	Muronjoma	1	3.33
219	Moteyatopa	1	3.33
220	Mokgethe	1	3.33
221	motshubabatho	1	3.33
222	Mosweu	1	3.33

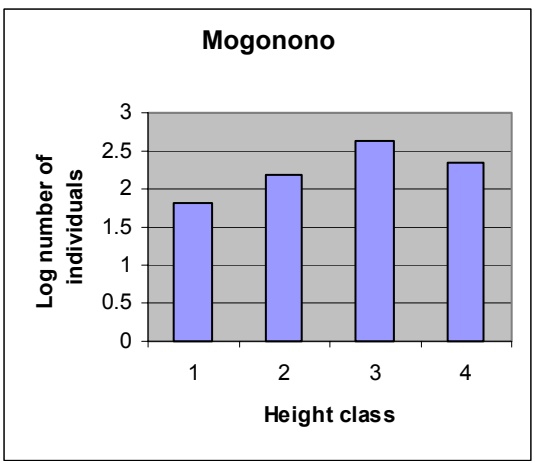
223 Rukukutu	1	3.33
224 Ruvahe	1	3.33
225 Ruespa	1	3.33
226 mokamanawa	1	3.33
227 Rondiama	1	3.33
228 Rothenduno	1	3.33
229 Ruhaama	1	3.33
230 Rureka	1	3.33
231 Ruvapa	1	3.33
232 Ruvovona	1	3.33
233 Ruridona	1	3.33
234 Ruoba	1	3.33
235 morumbambi	1	3.33
236 Mburi	1	3.33
237 motjiraokakashe	1	3.33
238 mogokapitse	1	3.33
239 Mosukudu	1	3.33
240 Monyaku	1	3.33
241 Borekajoo	1	3.33
242 Mokaikai	1	3.33
243 Mobute	1	3.33
244 Motau	1	3.33
245 moranbadongo	1	3.33
246 Mandomba	1	3.33
247 Mokate	1	3.33

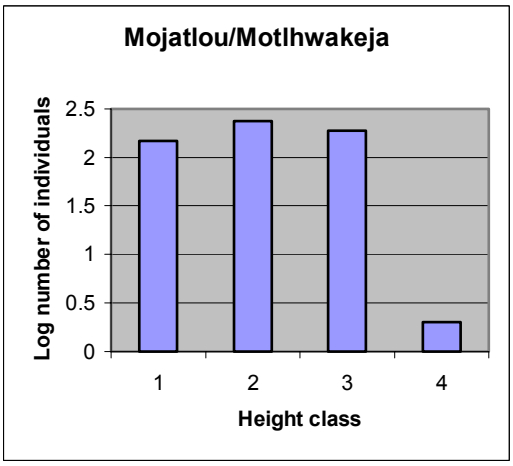
1.3.3 Comment

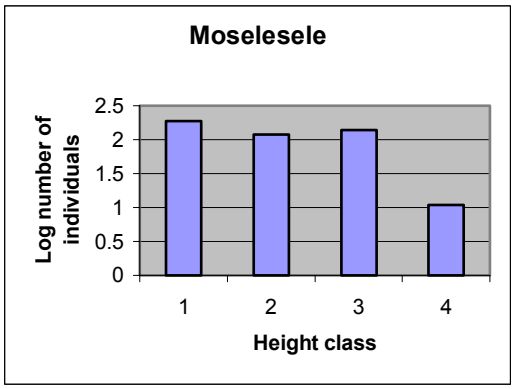
Given the nature of the non-woody resource, and taking into account the timing of the field exercise, the % frequency was the best indicator to assess the dominance of the herbaceous species. Attempting to assess the amount available for each non-woody species would have been very time-consuming and possibly called for use of destructive techniques. However, total non-woody biomass could in future be rapidly assessed using 'photo-standards'.

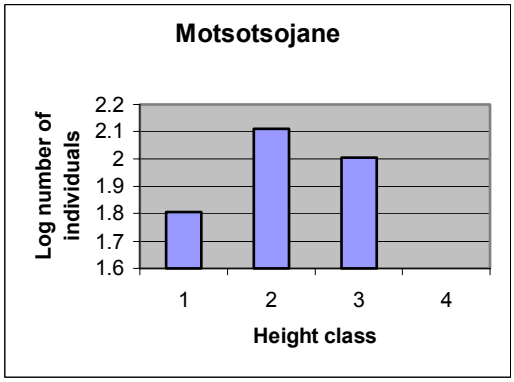
2. Population level analysis

2.1 Size class distributions of selected woody species






Moselesele
Log number of individuals
2.5
2
1.5
1
0.5
0
1
2
3
4
Height class


Motsotsojane
Log number of individuals
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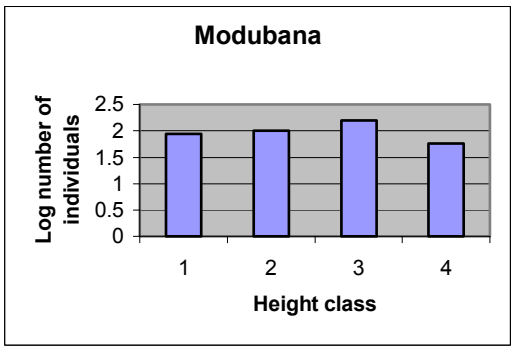
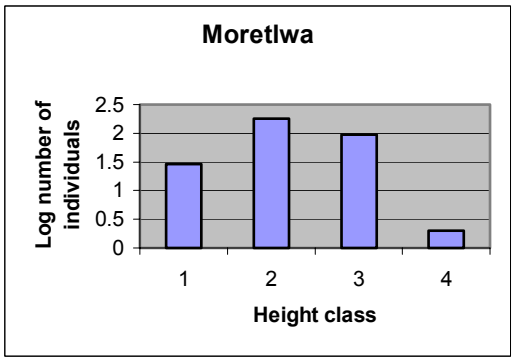
2.1
2
1.9
1.8
1.7
1.6
1
2
3
4
Height class


Modubana
Log number of individuals
2.5
2
1.5
1
0.5
0
1
2
3
4
Height class


Moretlwa
Log number of individuals
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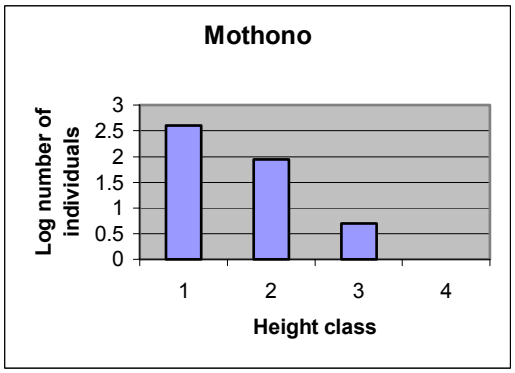
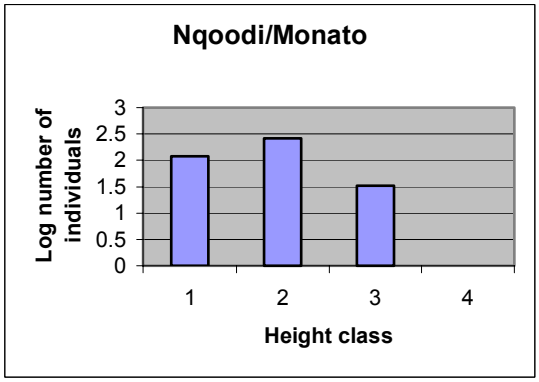
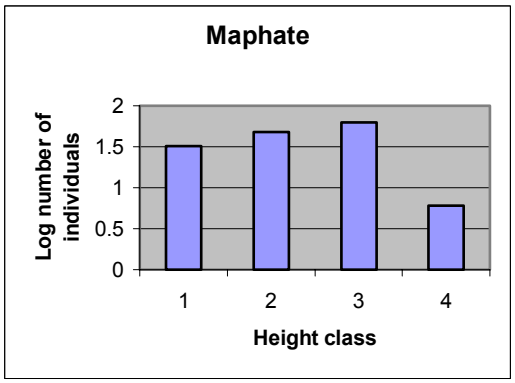
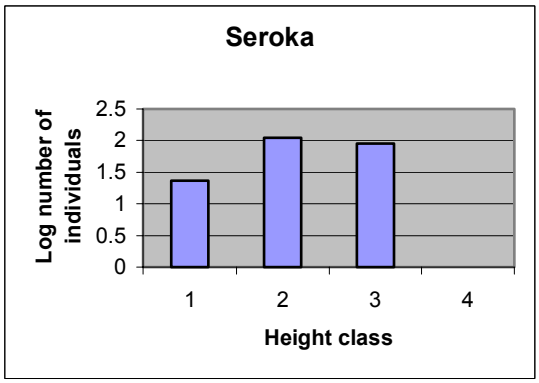
2
1.5
1
0.5
0
1
2
3
4
Height class


Mothono
Log number of individuals
3
2.5
2
1.5
1
0.5
0
1
2
3
4
Height class


Nqoodi/Monato
Log number of individuals
3
2.5
2
1.5
1
0.5
0
1
2
3
4
Height class


Maphate
Log number of individuals
2
1.5
1
0.5
0
1
2
3
4
Height class


Seroka
Log number of individuals
2.5
2
1.5
1
0.5
0
1
2
3
4
Height class

2.2 Discussion

The output above is a representation of the top ten woody species based on the Importance Values. The key for height classes is as follows:

1 = less than 0.5 metre
2 = 0.5 – 1.5 m
3 = 1.5 – 3 m
4 = more than 3 m

In this analysis height (size) is taken as an indicator of age. Hence, all individuals belonging to height class 1 are taken to be seedlings, while individuals in categories 3 and 4 are taken as adults. The analysis is a simple but reliable method to monitor the health and vigour of natural resource populations. For example, a population with no seedlings (individuals in height class 1) would reflect a species whose regeneration is severely limited for some reason.

3. Preliminary classification of woody species by ecological dominance (Importance value (IV))

High Dominance IV: >7	Medium Dominance IV: 2 - 7	Low Dominance IV: 0 – 1
Mogonono	Lebuta	Nxabe
Mojatlou/Motlhwakeja	Moologa	Mohata
Moselese	Mongana	Qhwaa
Motsotsojane	Mohudiri	Moretologa wa podi
Modubana	Mogwana	Qhae
Moretlwa	Morupaphiri	Njheka
Mothono	Mohahu	Mosu
Nqoodi/Monato	Motiwakatjipera	Kgaba ya sekwena
Maphate	Motsiara	Moretologa wa kgomo
Seroka	Moloto	Xhara
	Mosheshe	Xwii
	Mondanda	Lekwati
	Mogokatau	Mmilo/Mmupudu
	Motlopi	Marago a Bahumagadi
	Mokabi	Mokolwane
	Mogotlho	Molalakgaka
	Mokgwelekgwele	Onjenje
	Mokgalo	Morula
		Lephuratshukudu
		XhaiXhadi
		Mokwa
		Okuyumba
		Motswere
		Moparara
		Nqhoqwi
		Mokamanawa
		Motsweketsane
		Moumbajembu
		Motareka
		Monamaihi
		Tsaodi
		Xhwidwomaa

		Mokwapi
		Mokgotshe
		Mokgethashane
		Monyelenyele
		Moteya topa
		Monoga
		Mothepa
		Morobo

4. Ethnobotany

4.1 Local uses

4.1.1 Food

Species name	Parts used	Details of use
Motsotsojane / Qdwaa	Fruits	Fruits eaten but can be pounded to make 'soft porridge'
Mogotlho / Xana	Resin/gum	
Moselesele / Xwii	Gum	
Mosu / Xadi	Gum	
Moretlwa / Nxi	▪ Fruits ▪ Leaves	Seeds are not swallowed as it would result in constipation; leaves can be used as tea substitute
Motlopi / Zaa	▪ Fruits ▪ Roots	Seeds are not swallowed to prevent constipation; Roots added to milk to aid souring
Mmilo / Mmupudu / Nxhuru	Fruits	Fruits eaten but can be whipped with water or milk to make soft porridge
Maphate / Xone	Fruits	
Mongana / Nqdau	▪ Gum ▪ Roots	Roots or branch added to sour milk to give better taste and aid clot formation
Mokgwelekgwele / Qhong	Gum	
Moloto / !Xha	Gum	
Mogwana / Kamako	Fruits	Fruits eaten and sometimes put in traditional brandy (Khadi) for extra strength
Moretologa wa podi / Nqdwe	Fruits	Fruits eaten and can be whipped with milk to make a delicious drink
Moretologa wa kgomo / Ghomedqwe	Fruits	Fruits as for Moretologa wa podi
Mokgalo	Fruits	
Mohudiri / !Xlanya	Gum	
Mogonono / Ntsau	Gum	
Morula / !Kae	Fruits	
Mojatlou / Motlhwakeja	Seeds	Seeds roasted and eaten
Motiwakatjipera / Xinxwa	Fruits	
Morupaphiri / Xulube	Fruits	
Nxhwii / Mopeno	Fruits	
Mokolwane / Xhani	▪ Fruits ▪ Stem	Fruits eaten; young stem roasted and eaten (gao); Stem also tapped for wine
Mothono / Xwee	Fruits	
Tsaodi	Fruits	Edible fruits; fruits can be whipped with milk to make a drink; fruits can also be used to make soup
Motsiara / Qhoo	▪ Fruits ▪ Gum	Dried fruit used as tea substitute
Nqhoqwi	Fruits	
Mokamanawa	Fruits	
Seroka / Nxhoo	Stem	Young stem is eaten

Marago a bahumagadi / Makankele / Zhoma	Fruits	
Nxabe	Gum	
Mwadikoyo	Bulb/tuber	Edible bulb/tuber
Mbaruru / Mokauru / Kauru	Roots	Edible roots
Onyiya	Fruits	
Motswaitswai	Leaves	Edible leaves
Monyaku	Leaves	Traditional vegetable
Mosukudu	Leaves	Herbal tea
Moteyathopa	Roots	Root added to traditional mageu to improve taste
Mosukutshwane / Mosukujane	Leaves	Herbal tea
Mogau	Fruits	Fruits eaten but seeds not swallowed because they are poisonous
Phoka	Seeds	Seeds gathered and cooked as porridge
Letswai la khudu	Leaves	Edible leaves
Gudigajoo	Roots	Mostly eaten by children
Qhwaa / Lerusa	Tuber	Tuber eaten to quench thirst; water can be squeezed out of the roots
Thepe	Leaves	Traditional vegetable
Nxoodu / Kgopa	Flowers	Its red flowers are picked, cooked and eaten
Kgalegeta / Qhoeya	Leaves	Leaves are meshed in a mortar and eaten
Sesepasepe	Roots	Edible tuber
Xhaadi	Roots	Edible tuber
Nchong / Mohubala	Roots	Edible tuber
Nqhuuw a / Mothanthanyane	Fruits	Edible fruits
Shada	Roots	Edible tuber, rich in water; when roasted it looks and tastes like potato
Mokongo / !Nxlaa	Fruits	Fruits eaten and seeds produce oil which can be put into meat
Motsentsela	Fruits	
Mowana	Fruits	Fruits eaten and seeds used as coffee
Mogorogorwane	Fruits	
Mophale	Fruits	
Motauramboko	Gum	

4.1.2 Medicinal

Species name	**Parts used**	**Details of use**
Mogotlho / Qdwaa	Roots	Root of small tree treats cough
	Leaves	Chewed and sprinkled on child suffering from *nonyane*
Mokgwelekgwele / Qhong	Roots	To treat flu
Motlopi / Zaa	Roots	Treat stomach or intestinal pains; root fusion used to wash wounds and leaves ground then applied to wound
Mmilo / Mmupudu / Nxhuru	Roots	Treat heartaches, kidney problems and stress/depression
Moretologa wa podi / Nqdwe	Seeds	Roasted and ground to treat flu in children and also used as rubbing stuff
	Roots	Used to wash wounds; also used to treat venereal diseases
Moretologa wa kgomo / Ghomedqwe	Roots	Treat itchy skin
Mokgalo / Nxaa	Leaves	Chewed and placed on a boil to aid opening and healing
Njheka / Qae	Roots	Treats cough

Mogonono / Ntsau	Roots	To treat diarrhoea and stomach ache; also applied to wounds
Modubana / Xhwaa	Branches	Burnt with *mosetlho* and inhaled to treat fever
Morupaphiri / Xulube	Roots	To treat stomach ache and abdominal pains
Moologa / Xanana	Roots	Mixed with leaves to treat flu
Moselesele		To treat cough
Mothono / Xwee	Roots	To treat itchy skin; root and part of branch tied together and boiled to treat painful body
Motswere / Xoo	Leaves	To treat flu
	Roots	To treat running stomach
Mosheshe / Quu	Bark	To treat flu
Mogonono / Ntsau	Bark	Tied around head to relieve headache
Marago a bahumagadi / makankele / Zhoma	Roots	To treat diarrhoea in children
Mokgotshe	Bark	To treat stomach ache
Monoga / Xgali	Root	To treat headache and *diphate*
Motareka	Roots	To treat body pains
Mosetlho	Whole plant	Fumed with *modubana* and smoke inhaled to treat fever
Outhwi / Moshigaapoo	Roots	To treat headache
Mwadikoyo	Roots	To treat all illnesses
Motiomatuta	Roots	To treat venereal diseases
Mothamisapelo	Whole plant	To relieve stress or depression
Mbaruru / Mokauru / Kauru	Roots	To treat stomach ache
Mokaikai / Chikodima	Roots	Root fusion given to mother who has just given to help healing of uterus
Borekajoo / Mopepura	Stem	Stem and bark used to treat mentally disturbed persons
Monakaladi	Roots	To treat headache and sneezing
Monyaku	Roots	Laxative
	Seeds	Laxative
Moumbajembo	Roots	To treat venereal diseases
Makarupi	Whole plant	To treat stomach ache
Molemo wa nonyane		Mixed with other herbs to treat children with condition called *nonyane*
Motioshejumba		To relieve malaria symptoms
Madiakgokong / Xaodi		Blood cleanser
Mmaphofu		Improves sexual drive
Kgopane / Tjindombo		General body and blood cleanser, especially in mothers after delivery; leaves bolied to treat palpitations
Nche	Roots	To treat impotence and low sexual performance; also used to treat *diphate*
Tholwatholwana / Mantjirara / Motshebe		To treat cough and flu
Nqobuzwa / Seretwane	Roots	Root fusion to treat painful stomach
Legonyana	Roots	Used to treat a number of complaints such as backache, internal infections, abdominal pains and *makwebunyane*; it also improves appetite
Qhwaa / Lerusa	Roots	To treat itchy body
Xinxho		Used to work same way as *legonyana*
Mothepa	Roots	To treat abdominal pains
Sebabetsane	Roots	To treat painful legs and arms
Sengaparile	Roots	Blood and kidney cleanser
Letlhajwa	Roots	Root fusion given to pregnant women to reduce vomiting

4.1.3 Construction

Species name	Details of use
Motsotsojane / Qdwaa	Branches used for roof rafters
Mogotlho / Xana	Branches used for fencing and kraals (*Matlhaku*)
Moselesele / Xwii	*Matlhaku*
Mosu / Xadi	*Matlhaku*
Moretlwa / Nxi	Stems used for roof rafters
Mongana / Nqdau	*Matlhaku* for fencing
Mokgwelekgwele / Qhong	*Matlhaku*
Mogwana / Kamako	Roof rafters
Mokgalo / Nxaa	Roof rafters
Mogonono / Ntsau	Poles
Modubana / Xhwaa	Bark stripped to make ropes
Mohahu	*Matlhaku*
Mogokatau / Qudqumcolo	Young stems used as rafters for huts; branches used for *matlhaku*
Mokolwane / Xhani	Stripped bark (*xingxhoma*) used for roofing huts
Motsiara/Qhoo	Hut ploes
Mokgotshe	Bark stripped to make string used to tie hut roofs at the top; string also used to tie reeds (*lotlhaka*)
Motauramboko	*Matlhaku*
Mokamakama	Thatching grass
Motsikiri	Thatching grass
Tshikitshane	Thatching grass
Hoke /Seloka / Mogatla wa peba	Thatching grass
Nqooni	Thatching grass

4.1.4 Household equipment

Species name	Details of use
Motsotsojane / Qdwaa	Sticks used in fire making; branches used to make *sefalana* (sorghum storage)
Moselesele / Xwii	Digging sticks
Moretlwa / Nxi	Walking sticks; cooking stick (lefetlho);Bark stripped and used as rope.
Maphate / Xone	Fire making tools
Mokgwelekgwele / Qhong	Arrow containers (Kgaphana)
Mogwana / Kamako	*Sefalana* (sorghum storage) and hunting bows; baskets
Mokgalo / Nxaa	Stools and saddles
Njheka / Qae	Digging stick
Mokabi / Qabe	Stem used to make axe or hoe handle; stem also used to make horse saddle; used as beating stick (thupa) at home and foe donkeys
Seroka / Nxhoo	Trunk used to make buckets, basins and can be carved into honey-container
Morula / !Kae	Trunk used to make mortar, buckets and basins
Morupaphiri / Xulube	Arrow handles; leaves are used to make smoke for bee harvesting
Mokolwane / Xhani	Baskets; part of leaf blade called *tsitsiri* used to make sweeping brooms
Mothono / Xwee	Fire making tools
Molalakgaka	Wooden spoons
Mosheshe / Quu	Mortar and cattle troughs
Motswere / Xoo	Cattle troughs
Mokwa / Xhee	Main carpentry wood used to make planks, doors, tables and chairs
Marago a bahumagadi / Makankele / Zhoma	Root used as *Kaitso* container plug
Mokgotshe	Young tree used to make rolling mat (moseme)

Moumbajembu	Cooking stick (lefetlho)
Mokongo / !Nxlaa	Fire making tools
Mowana	Bark harvested to make string/rope
Bogoma / Tjiramata	Flower put inside smoking pipe to act as filter; ashes also mixed with tobacco to make snuff
Seriri sa tau	Used in fire making tools
Tlhogotshweu	Flowers used to stuff pillows

4.1.5 Fuelwood

Species name
Mogotlho/Xana
Moselesele/Xwii
Mosu/Xadi
Mongana/Nqdau
Mokgwelekgwele/Qhong
Moloto/!Xha
Njheka/Qae
Mogonono/Ntsau
Modubana/Xhwaa
Mohahu
Molalakgaka
Lekwati
Motswere
Mosheshe/Quu
Motsentsela

4.1.6 Cultural and symbolic uses

Species name	**Details of use**
Nyanga / Sekaname	Bulb fusion used to prevent fields from witches
Palamela	Believed to bring good luck, especially when found on *moretologa wa podi*
Mokaikai / Chikodima	Roots burnt to prevent wild animals from tracking and hurting people
Bogoma / Tjiramata	Ashes mixed with tobacco to make snuff
Chobachobane	Roots fumed around homestead in the evening to scare away witches
Masegomabe	Brings good luck
Loswe / Nqhaodi	Root fusion used to wash away bad luck (*dikgaba*)
Thepe / Qhowe qhowe	Leaves burnt to produce good ash to mix with ground tobacco
Kgaba e tona / Qanqi	Root fusion used to wash away bad luck
Kgaba e e mashi	Roots used to protect infants from harm (*kokamo*)
Mothepa / Tshikadithata	Roots ground and put on circumcision wounds
Ditedu tsa banna	Ash mixed with tobacco to make snuff
Guduro	Leaves make tobacco; same use as *chobachobane*
Moretlwa / Nxi	Bark stripped to make strings tied around waist during heavy menstrual periods
Mogonono / Ntsau	Root used to treat wounds by predators on livestock
Seroka / Nxhoo	Houses beetles used for arrow poisoning
Morupaphiri / Xulube	Roots used to make a musical instrument called *soorooro*
Moologa / Xanana	Roots mixed with other herbs and burnt at the kraal to protect cattle from witchcraft
Kgaba ya sekwena	Roots used to wash away bad luck caused by other people's pettiness
Kgaba e e mashi / Qubu qubu/Monamaihi	Used to scare away troublesome spirits (*dikgaba*)

4.1.7 Handicrafts

Species name	Details of use
Moselesele / Xwii	Beads making
Mokwa / Xhee	Animal carving; bark used in skin tanning as dye
Onjenje	Beads making
Mogonono / Ntsau	Roots used as skin/hide dye (yellow)
Mojatlou / Motlhwakeja	Beads making
Letlhajwa	Roots boiled with *Mokola* to give it an orange colour
Motsentsela	Roots and bark boiled with *mokola* to give it black or brown colour
Motlhakola	Roots give *mokola* a black colour
Mositsana / Monjwethe	Bark used as skin/hide dye (*mokwaipo*)
Chobachobane	Roots chopped and used in beads making
Tholwatholwana / Mantjiarara / Motshebe	Fruits used by kids to make toys
Kaitswa / Xamhu / Dao / Rupapa / morokolodi	Stem and roots used in beads making

4.1.8 Beauty products/cosmetics

Species name	Details of use
Chobachobane	Roots used as detergent
Haobebe	Used to give pleasant scent (perfume)
Kaitswa / Xamhu / Dao / Rupapa / morokolodi	Perfume; used to give blankets a pleasant smell
Kaitswa / Kadli	Perfume
Kaitswa ya motlhaba	Perfume
Kaitswa ya diphofu	Perfume
Moretologa wa podi / Nqdwe	Oil in the seeds used to soften skin
Njheka / Qae	Stem used to clean teeth
Seroka / Nxhoo	Gum used as detergent
Mokongo / !Nxlaa	Leaves boiled and fusion used to relax/stretch hair
Letlhajwa	Roots used to clean teeth
Motlhakola	Used to clean teeth

4.1.9 Poisonous plants

Species name	Details
Nyanga / Sekaname	Poisonous to livestock, especially goats
Mogau	Poisonous to cattle; Seeds are poisonous to humans if swallowed
Tshwaa / Ngomba / Boditse ja tau	Poisonous to cattle if eaten alone
Kaitswa / Xamhu / Dao / Rupapa / morokolodi	Produces milky latex which can cause blindness if in contact with eyes

4.1.10 Plants mentioned as good livestock fodder

Species name	Details
Mosetlho	Cattle
Motsokotsane / Ruthenga	Goats
Monyaku	All livestock
Motlhwa / Motlho	All livestock
Tshwaa / Ngomba /	All livestock

Boditse ja tau	
Bojang ja pitse	All livestock except goats
Mokgalo / Nxaa	All livestock, especially goats

4.2 Local Use Values

4.2.1 Computation

The following formula is applied for each species:

$$UVs = \sum Uis/Ni$$

Where,
UVs = Local use value of species, **s**;
Uis = Number of uses of species **s** mentioned by informant **i**;
Ni = Total number of informants

4.2.2 Examples of Species Use Values

The following are based on preliminary data collected during the initial sampling exercise on 12th May 2002.

Moretologa wa podi:

Informant 1 mentioned 2 uses (food and medicine)
Informant 2 mentioned 2 uses (food and medicine)
Informant 3 mentioned 1 use (food)
Informant 4 mentioned 2 uses (food and medicine)

Therefore,

UV (moretologa) = (2+2+1+2)/4 = **1.75**

Mogotlho:

Informant 1 mentioned 1 use (household equipment)
Informant 2 mentioned 0 use
Informant 3 mentioned 2 uses (fuelwood and medicine)
Informant 4 mentioned 0 use

Therefore,

UV (mogotlho) = (1+0+2+0)/4 = **0.75**

Petition:

Informant 1 mentioned 0 use
Informant 2 mentioned 0 use
Informant 3 mentioned 0 use

Therefore,

UV (petition) = 0/3 = **0**

Thepe:

Informant 1 mentioned 2 uses (food and tobacco)
Informant 2 mentioned 1 use (food)
Informant 3 mentioned 2 uses (food and cultural (phekolo))

Therefore,

UV (thepe) = (2+1+2)/3 = **1.67**

4.2.3 Comment

Species with a high Use Value are taken to be more important to the local people than those with a low UV. The employment of UV is partly to account for social factors, which may come into play when species are being selected for management. For example, some species may have a long history of traditional use and there may be a cultural bias towards continued exploitation of those resources. On the other hand, some species with medicinal or ceremonial importance may be subject to certain taboos that may prohibit commercial exploitation.

5. Wildlife

5.1 Computation

The wildlife data (sighting frequencies) was analysed using "crosstabulations". Crosstabulation is a combination of two (or more) frequency tables arranged such that each cell in the resulting table represents a unique combination of specific values of crosstabulated variables. Thus, crosstabulation allows us to examine frequencies of observations that belong to specific categories on more than one variable. By examining these frequencies, we can identify relations between crosstabulated variables. In this case, wildlife species seen by interviewed local people was crossed with the location where the species was seen.

Crosstabulations have been selected for the Qangwa system because they would allow relationships between categorical variables to be measured and to further evaluate their reliability (statistical significance). However, in this report only the pattern of frequencies is reported for the sake of simplicity.

5.2 Results

Number of sightings per location

SPECIES	*LOCATION*				
	Xausha	Kaaha Nxoo	Dobe	Magopa2	Dobe-Xubi
Kgokong	2	1	2	1	0
Kukama	1	0	2	1	0
Tholo	0	2	4	0	0
Kgori	0	0	2	0	0
Kolobe	0	0	3	1	0
Ntshe	3	0	1	0	0
Phokoje	0	0	5	1	0
Phiri	0	0	4	1	0

Noko	0	0	4	0	0
Phuti	0	0	6	1	0
Phuduhudu	0	0	5	1	0
Tlou	1	0	3	1	0
Thakadu	0	0	1	0	0
Nkwe	0	0	3	1	0
Letlhalerwa	0	1	3	1	0
Motlhose	0	0	3	1	0
Letotse	0	0	2	0	0
Kgaka	1	0	3	0	0
Lesogo	0	0	2	0	0
Kgaga	0	0	1	0	0
Ntlole	0	0	1	0	0
Pitse ya naga	0	0	3	0	0
Kolobe	0	0	0	0	1
Phofu	0	0	0	1	0
Mmutla	0	0	1	0	0
Tshipa	0	0	1	0	0
Thukwi	0	0	1	0	0
Thutlwa	0	0	0	0	0
Tshepelele	0	0	0	0	0
Matshwane	0	0	1	0	0
Khudu	0	0	0	0	0
Koro	0	0	0	0	0
Sethora	0	0	0	0	0
Thatswane	0	0	0	0	0
Sekatamosima	0	0	0	0	0
TOTAL	*8*	*4*	*67*	*12*	*1*

Continued….

	Dobe-Xabi	Xubi	Magopa	Tjiramba-Tjavarui	Tjiratjira
Kgokong	0	0	0	0	1
Kukama	0	0	1	0	0
Tholo	0	1	2	0	0
Kgori	0	0	0	0	0
Kolobe	0	0	2	0	0
Ntshe	1	0	0	0	0
Phokoje	0	0	1	0	0
Phiri	0	0	2	0	0
Noko	0	0	0	0	0
Phuti	0	0	0	0	0
Phuduhudu	0	0	0	0	0
Tlou	0	0	0	0	0
Thakadu	0	0	0	0	0
Nkwe	0	0	1	0	0
Letlhalerwa	0	0	1	0	0
Motlhose	0	0	3	0	0
Letotse	0	0	0	0	0
Kgaka	0	0	1	0	0
Lesogo	0	0	0	0	0
Kgaga	0	0	0	0	0
Ntlole	0	0	0	0	0
Pitse ya naga	0	0	0	0	0

Kolobe	0	0	0	0	0
Phofu	0	0	0	1	0
Mmutla	0	0	1	0	0
Tshipa	0	0	1	0	0
Thukwi	0	0	0	0	0
Thutlwa	0	0	0	0	0
Tshepelele	0	0	1	0	0
Matshwane	0	0	0	0	0
Khudu	0	0	0	0	0
Koro	0	0	0	0	0
Sethora	0	0	0	0	0
Thatswane	0	0	0	0	0
Sekatamosima	0	0	0	0	0
TOTAL	*1*	*1*	*17*	*1*	*1*

Continued….

	Characharaha	Kapatji	Kahorekwa	Morotsi	Tjirongo
Kgokong	2	0	0	0	0
Kukama	0	1	0	1	1
Tholo	0	0	1	0	1
Kgori	0	0	0	0	0
Kolobe	0	0	0	0	0
Ntshe	0	0	0	0	0
Phokoje	0	0	0	0	0
Phiri	0	0	0	0	0
Noko	0	0	0	0	0
Phuti	0	0	0	0	1
Phuduhudu	0	0	0	0	0
Tlou	2	0	0	0	0
Thakadu	0	0	0	0	0
Nkwe	0	0	0	0	0
Letlhalerwa	0	0	0	0	0
Motlhose	0	0	0	0	0
Letotse	0	0	0	0	0
Kgaka	0	0	0	0	0
Lesogo	0	0	0	0	0
Kgaga	0	0	0	0	0
Ntlole	0	0	0	0	0
Pitse ya naga	0	0	0	0	0
Phofu	0	2	0	0	0
Mmutla	0	0	0	0	0
Tshipa	0	0	0	0	0
Thukwi	0	0	0	0	0
Thutlwa	0	1	0	0	0
Tshepelele	0	0	0	0	0
Matshwane	0	0	0	0	0
Khudu	0	0	0	0	0
Koro	0	0	0	0	0
Sethora	0	0	0	0	0
Thatswane	0	0	0	0	0
Sekatamosima	0	0	0	0	0
TOTAL 4	*4*	*1*	*1*	*3*	

Continued….

	Xanxo	Xarinxago	Qhooshe	Matlhatsa	Xuxoro
Kgokong	0	0	1	0	0
Kukama	0	0	0	1	1
Tholo	0	0	2	0	0
Kgori	0	0	0	0	0
Kolobe	0	0	0	0	0
Ntshe	1	0	0	0	0
Phokoje	0	0	1	0	0
Phiri	0	0	0	0	0
Noko	0	0	0	0	0
Phuti	0	0	2	0	0
Phuduhudu	0	0	2	0	0
Tlou	0	1	0	0	0
Thakadu	0	0	0	0	0
Nkwe	0	0	1	0	0
Letlhalerwa	0	0	0	0	0
Motlhose	0	0	0	0	0
Letotse	0	0	0	0	0
Kgaka	1	0	1	0	0
Lesogo	0	0	1	0	0
Kgaga	0	0	0	0	0
Ntlole	0	0	0	0	0
Pitse ya naga	0	0	0	0	0
Phofu	0	0	0	0	0
Mmutla	0	0	1	0	0
Tshipa	0	0	0	0	0
Thukwi	0	0	0	0	0
Thutlwa	0	0	0	0	0
Tshepelele	0	0	0	0	0
Matshwane	0	0	0	0	0
Khudu	0	0	1	0	0
Koro	0	0	0	0	0
Sethora	0	0	0	0	0
Thatswane	0	0	0	0	0
Sekatamosima	0	0	0	0	0
TOTAL	*2*	*1*	*13*	*1*	*1*

Continued….

	Xubashama	Mahitlho	Ngarangobe	Juhaqho	Qangwa
Kgokong	0	1	2	0	0
Kukama	0	1	2	1	0
Tholo	0	0	0	1	0
Kgori	0	0	0	0	0
Kolobe	0	1	1	0	0
Ntshe	0	0	0	0	0
Phokoje	0	0	1	0	0
Phiri	0	0	0	0	0
Noko	0	0	1	0	0
Phuti	0	2	3	1	1
Phuduhudu	0	1	2	1	0
Tlou	0	0	2	0	0

Thakadu	0	0	0	0	0
Nkwe	0	1	2	1	0
Letlhalerwa	0	0	2	1	0
Motlhose	0	0	1	0	0
Letotse	0	0	0	0	0
Kgaka	0	1	0	0	0
Lesogo	0	0	0	0	3
Kgaga	0	0	0	0	0
Ntlole	0	0	0	0	1
Pitse ya naga	0	0	0	0	1
Phofu	1	0	0	0	0
Mmutla	0	1	1	0	3
Tshipa	0	0	0	0	0
Thukwi	0	0	0	0	0
Thutlwa	0	0	0	0	0
Tshepelele	0	0	0	0	0
Matshwane	0	0	0	0	0
Khudu	0	0	1	0	1
Koro	0	0	0	0	1
Sethora	0	0	0	0	1
Thatswane	0	0	0	0	1
Sekatamosima	0	0	0	0	3
TOTAL	*1*	*9*	*22*	*6*	*16*

Continued….

	Kadwi	Xanaxago	Nxwe Qoma	Row Totals
Kgokong	0	0	0	13
Kukama	0	1	0	14
Tholo	0	1	0	14
Kgori	0	0	0	2
Kolobe	1	0	1	10
Ntshe	0	0	0	6
Phokoje	0	0	0	9
Phiri	0	0	0	7
Noko	0	0	0	5
Phuti	0	1	1	18
Phuduhudu	0	0	0	12
Tlou	0	0	0	10
Thakadu	0	0	0	1
Nkwe	0	0	0	10
Letlhalerwa	0	0	0	9
Motlhose	0	0	0	8
Letotse	0	0	1	3
Kgaka	0	0	0	8
Lesogo	1	0	0	7
Kgaga	0	0	0	1
Ntlole	1	0	0	3
Pitse ya naga	0	0	0	4
Phofu	0	0	0	5
Mmutla	0	0	0	8
Tshipa	0	0	0	2
Thukwi	0	0	0	1
Thutlwa	0	0	0	1

Tshepelele	0	0	0	1
Matshwane	0	0	0	1
Khudu	0	0	0	3
Koro	0	0	0	1
Sethora	0	0	0	1
Thatswane	0	0	0	1
Sekatamosima	0	0	0	3
TOTAL	*3*	*3*	*1*	*202*

5.3 Comment

From January to May, 2002 thirty-four species of wildlife were reportedly seen at 27 different locations around the Qangwa area constituting a total of 202 wildlife sightings. Although no strong relationships could be discerned from the results, the majority of wildlife sightings (67) were recorded in and around Dobe.

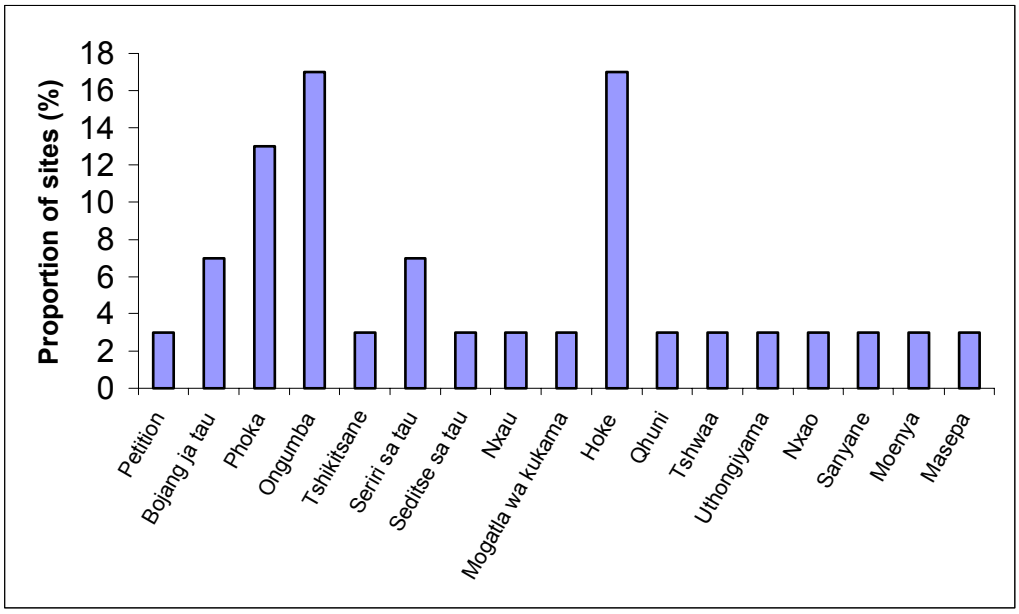
6. Site description

6.1 Computation

Again, crosstabulations were used to generate the following outputs.

6.2 Results

6.2.1 Site description by most abundant non-woody species based on 'Dry Matter Rank' (DMR)



Hoke was recorded at the majority of sites as the most abundant species, followed by *Ongumba* and *Phoka*.

6.2.2 Site description by grazing intensity

1=indicated; 0=not indicated

SITE	GRAZING				Row
	None	Low	Medium	High	Totals
1	1	0	0	0	1
2	0	1	0	0	1
3	0	1	0	0	1
4	0	1	0	0	1
5	1	0	0	0	1
6	1	0	0	0	1
7	0	1	0	0	1
8	0	0	0	1	1
9	0	0	1	0	1
10	0	1	0	0	1
11	0	1	0	0	1
12	0	1	0	0	1
13	1	0	0	0	1
14	0	1	0	0	1
15	1	0	0	0	1
16	0	1	0	0	1
17	0	1	0	0	1
18	0	1	0	0	1
19	0	1	0	0	1
20	0	1	0	0	1
21	0	1	0	0	1
22	0	0	1	0	1
23	0	1	0	0	1
24	1	0	0	0	1
25	1	0	0	0	1
26	1	0	0	0	1
27	1	0	0	0	1
28	1	0	0	0	1
29	0	0	1	0	1
30	1	0	0	0	1
Total	**11**	**15**	**3**	**1**	**30**

The majority of sites were either not grazed (11/30) or had low grazing (15/30).

6.2.3 Site description by intensity of erosion

1=indicated; 0=not indicated

SITE	EROSION		Row
	None	Low	Totals
1	0	1	1
2	0	1	1
3	0	1	1
4	0	1	1
5	1	0	1
6	1	0	1
7	1	0	1
8	0	1	1
9	0	1	1
10	1	0	1
11	1	0	1
12	1	0	1
13	1	0	1
14	1	0	1

15	1	0	1
16	1	0	1
17	0	1	1
18	1	0	1
19	1	0	1
20	0	1	1
21	1	0	1
22	0	1	1
23	1	0	1
24	1	0	1
25	1	0	1
26	1	0	1
27	1	0	1
28	1	0	1
29	1	0	1
30	1	0	1
TOTAL	**21**	**9**	**30**

Most of the sites (21/30) had no soil erosion, with the rest having low soil erosion (9/30).

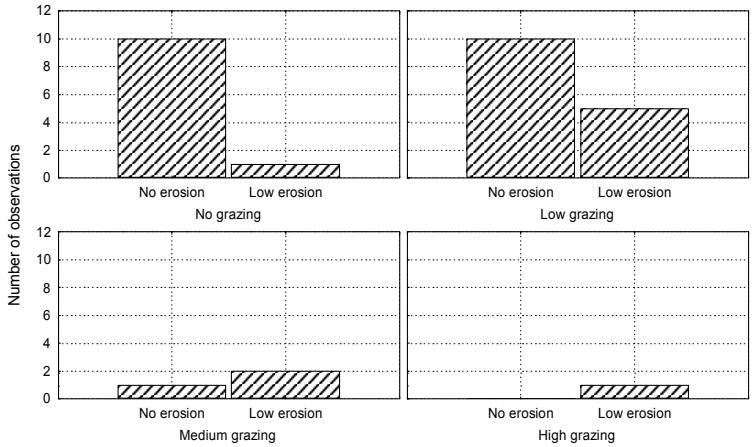
6.2.4 Site description by percentage woody cover

1=indicated; 0=not indicated

SITE	**% WOODY COVER**			**Row**
	Low	Medium	High	**Totals**
1	0	1	0	1
2	0	0	1	1
3	0	0	1	1
4	0	0	1	1
5	0	0	1	1
6	0	0	1	1
7	0	0	1	1
8	0	0	1	1
9	0	0	1	1
10	0	0	1	1
11	0	0	1	1
12	0	0	1	1
13	0	0	1	1
14	0	0	1	1
15	0	0	1	1
16	0	0	1	1
17	0	0	1	1
18	0	0	1	1
19	0	0	1	1
20	0	0	1	1
21	0	0	1	1
22	0	0	1	1
23	1	0	0	1
24	0	0	1	1
25	0	0	1	1
26	0	0	1	1
27	0	0	1	1
28	0	0	1	1
29	0	0	1	1
30	0	0	1	1
TOTAL	**1**	**1**	**28**	**30**

Almost all sites (28/30) had high Total Woody Cover.

6.2.5 Site description by Grazing vs. Erosion

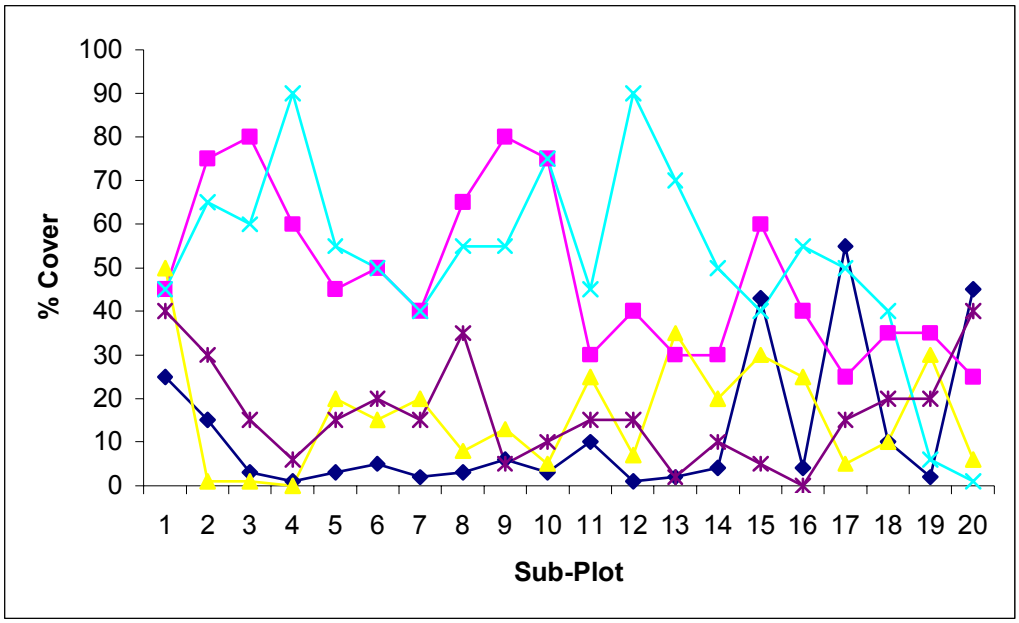


Sites with No or Low soil erosion also tended to have No or Low grazing.

6.2.6 Site description by Erosion vs. Termites presence

In general, termites were more likely to be found at sites with no soil erosion, even though the termites were mostly found in low numbers.

6.2.7 Site description by percentage non-woody cover



At each site, 20 sub-plots were randomly selected and percentage non-woody cover measured. Sampling sites were very patchy, with a range of cover values from very low to high always recorded on the same site. The above output is a representation of 5 of the sites.

5. Management implications

One of the objectives for Qangwa is to assess potential for sustainable utilisation of the natural resources. The following basic information would be needed to select a species for exploitation:

- Life cycle characteristics;
- Multiplicity of uses and types of resources produced;
- Abundance and distribution of the resources;
- Size class distribution of populations.

Once the information is collected, it can be used to provide an ecological framework for comparing different species to assess their management potential. However, the final selection for a species to be managed may ultimately be based on economic criteria, which have so far not been incorporated into the Qangwa system.

5.1 Rapid Vulnerability Assessment

Rapid Vulnerability Assessment (RVA) is recommended as the most appropriate method to decide whether or not a resource species is suitable for exploitation. RVA was developed as a quick way of collating both scientific and indigenous information about a resource species; indigenous and scientific information is integrated, matching local and scientific names to make the link.

The information is evaluated according to sustainability criteria drawn from ecology, socio-economics and economics for each species, which is then assigned a management category with a set of management recommendations.

5.2 Example of criteria used in RVA

Criteria	**Potential for sustainable use**	
	Low	***High***
Ecology	Low abundance	High abundance
	Slow growth	Fast growth
	Slow reproduction	Fast reproduction
	Sexual reproduction only	Vegetative reprodution
	Habitat specific	Habitat non-specific
	High habitat diversity	Low habitat diversity
	High life form diversity	Low life form diversity
Life form	Use of grasses is likely to be more sustainable than trees	
Parts used	Use of fruits/leaves/stem is more sustainable than of the roots (if damaging) or the whole plant	
Method of harvesting	Potential for sustainable harvesting is higher if size/age classes are not selected; harvesting of only one particular age or size class can place pressure on the whole population	

5.3 Check list of information collected so far for Qangwa

Information	**Availability**	**Indicator used**	**Remarks**
Life form	Yes	Woody/Non-woody	
Habitat specificity	No	-	Potentially available in scientific literature
Abundance and distribution	Yes	Importance Value	
Growth rate	No	-	Potentially available in scientific literature
Response to harvesting	No	-	
Parts used	Yes	Fruits / Seeds / Bark / Stem / Whole plant	
Patterns of selection and use	Yes	Local Use Value	
Demand	No		
Seasonal harvesting	No		
Traditional conservation practices	No	-	Can be incorporated into ethnobotanical questionnaires
Commercialisation and substitutes	No		

&&&&&&&