The use of Long-term Ecological Data to Facilitate Effective Range Management during the Current Drought

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BACKGROUND

- Large private protected areas (PPA) adjacent to the Kruger National Park (KNP) have embraced the basic philosophies of the KNP management approach since the removal of the fence between them in the early 1990's;
- In the PPA's animal movement is possible but due to their smaller size and excessive surface water provision (man induced spatial re-scaling), these areas presents a unique set of challenges to management;
- While the PPA's and KNP have similar general philosophies around management and objectives they function at different spatial scales

CONSEQUENCES OF MAN-INDUCED RE-SCALING OF THE SAVANNA SYSTEM

- Eruption of 'sedentary' water dependent species;
- Increased animal concentrations;
- Altered utilisation patterns both in time (continuous) and space (limited);

AND

- ultimately system functioning;
- Reduced water infiltration and increased runoff - Changes in grass cover/composition - Altered tree:grass interactions - Altered 'biodiversity' and 'sustainability'

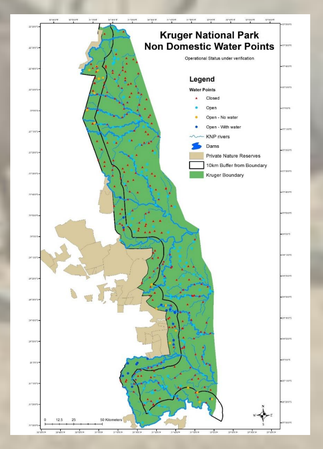
THE CURRENT DROUGHT IN THE EASTERN LOWVELD

THE GOOD TIMES CANNOT GO ON FOR GOOD

- Using long term ecological data (>25y) – use science – knowledge gained – attempt - effectively manage these savannas proactively;
- Correspondence to landowners relating to increasing game numbers - response to favourable rainfall seasons and grazing conditions within protected areas began in 2013/14;
- Followed up
  - 2014/15 annual reports – following first drought season;
  - December 2015 – early season rains failed;
  - Second drought 2015/16 - drought reports (up to version 8 in one case) to PPA's – highlighting the gravity of the situation

WATER PROVISION – ASSOCIATION OF PRIVATE NATURE RESERVES (APNR) VS. THE ADJACENT KNP

- The KNP started closing water points in the early 2000's – current situation (Figure 1);
- Current density – artificial water points:
  - APNR - 1 water point 731ha^{-1};
  - KNP – 10km buffer adjacent to the APNR – 1 water point 51 440ha^{-1};



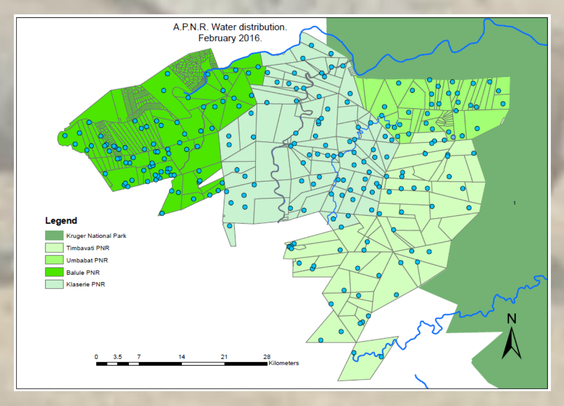


Fig. 1 Water point density KNP vs APNR

DATA, DROUGHT AND MANAGEMENT RESULTS AND DISCUSSION

RAINFALL

- APNR as % of mean annual rainfall:
  - 2014/15 – 67-85%;
  - 2015/16 – still being processed – ≈ 63%;
- We are into a second year of drought

VEGETATION

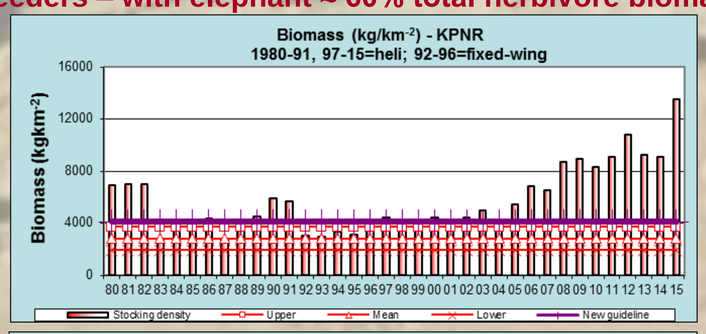
- Prediction of decline in 2016 from 2013/14 and 2014/15 vegetation results (Table 1);

Table 1 Rainfall, perennial grasses and grass standing crop: 2013-2015

Reserve	Rainfall (mm) 13/14	Rainfall (mm) 14/15	Per (%) 13/14	Per (%) 14/15	Per distance (mm) 13/14	Per distance (mm) 14/15	Per tuft size (mm) 13/14	Per tuft size (mm) 14/15	Standing crop (kgha^{-1}) 13/14	Standing crop (kgha^{-1}) 14/15
KPNR	581	302	86	83	62	103	47	45	2 089	879
UPNR	619	292	88	84	76	110	49	46	1 941	863
TPNR	738	460	95	88	32	56	48	51	2 577	1 482
BNR	665	337	62	65	96	98	26	24	1 352	257

ANIMALS

- 2015 stocking density (Figure 2) - twice that of the 1982/83 drought which resulted in large scale animal and perennial grass mortality;
- 2015 species mixes – currently dominated by mixed feeders – with elephant ≈ 60% total herbivore biomass -



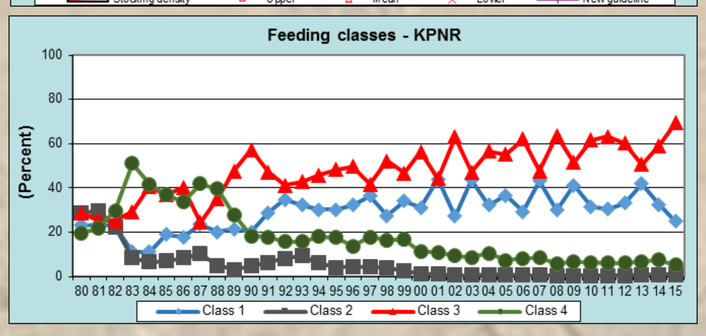


Fig. 2 and 3 Stocking density trends (top) and feeding class mixes (1 bulk, 2 selective, 3 mixed, 4 browsers) – APNR.

AN ADAPTIVE APPROACH TO MANAGEMENT

- Model – constructed to determine forage availability - predicts that numbers normally allocated to annual management removals and hunting – too low to avoid predicted large scale die-offs;
- New quotas set – minimum to maintain the grazing component and ensure acceptable rate of recovery of the grass sward after drought – but there will still be die-offs;
  - Buffalo 1 660-2 160 animals (23-30% of the population); White rhino (32%) live removal – cannot afford to lose rhino to poaching and drought; hippo 48-103 (15-33%); elephant 353-1 000 (13-38%); and impala 10 700-14 700 (35-49%)

WHAT ARE THE GAME MANAGEMENT OPTIONS?

- Do nothing;
- Manipulate the environment (e.g. close water points – unlikely to be able to close enough to equalize with KNP density);
- Live removals/translocation – hippo and rhino at least;
- Large scale contraception of elephant – feasible in the middle term – start as a matter of urgency – too late to alleviate the situation in this drought;
- Cull – where all avenues exhausted until the contraception programme yields results

OPPORTUNITIES

- Initiate the 'wildlife economy' in local rural communities – translocation of game, fencing etc. – we have the expertise to determine requirements for successful operation in terms of – rangeland condition, appropriate numbers and types of animals;
- Excellent partnership/collaboration exercise for PPA's – goodwill through real beneficiation

CHALLENGES

- Start up inertia – authorities to expedite authorizations – veterinary, permits, fencing, staffing;
- Strong national and international anti management lobby in respect of hunting and (last resort option) culling options;
- CITES and COP meetings in South Africa – deferred decision making by authorities – 5 months to rains – WE DO NOT HAVE TIME