# A NATURAL RESOURCE INVENTORY OF SANGO RANCH, SAVE VALLEY CONSERVANCY, ZIMBABWE

by

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## SUMMARY

Ecological data were collected from January 1998 to September 2000 on Sango Ranch, Save Valley Conservancy, southeastern Zimbabwe.

A background is given on the physiography, geology, climate, soils, vegetation, animals and history of the Save Valley Conservancy. The mission statement and objectives for the Save Valley Conservancy and Sango Ranch are described. Rainfall and temperature data were analysed and a climatogram for Sango Ranch is presented.

A superficial soil survey was conducted and the soils are classified into soil groups. The soils of Sango Ranch vary from deep fertile alkaline soils to shallow rocky acidic soils.

The Braun-Blanquet method was used to identify, classify and describe the vegetation on Sango Ranch. Nine plant communities and 16 subcommunities are described. The belt transect method was used to describe the vegetation structure. The vegetation types of Sango Ranch vary from forest to open woodland. A DECORANA ordination was applied and environmental gradients were identified and discussed. Six management units were identified and described, using a TWINSPAN classification.

The step-point method was used to determine the herbaceous species composition. A DECORANA ordination was applied to the grass data from the Braun-Blanquet survey to determine a degradation gradient. A gradient ranging from severely overutilised to slightly utilised was identified. Twenty grass species were allocated to ecological categories according to their responses to grazing pressure. Veld condition for each management unit was determined using the Ecological Index Method. Veld condition varies from moderate to good.

Herbaceous biomass data were collected by means of the disc-pasture meter. Herbaceous biomass for the management units varies from 1 520 to 5 092 kg per ha. It is recommended that the disc-pasture meter be calibrated for the area to allow for more accurate estimates.

The BECVOL method and computer program were used to determine the available browse on Sango Ranch. Only 6.2 % of palatable browse is available to browsing animals. The GRAZE program (Bredenkamp pers. comm.)[13] yielded an ecological capacity of 7 056 LSU during average rainfall periods and 3 727.2 LSU during below average rainfall periods. The browsing capacity was calculated at 651.4 LSU for average rainfall periods and 325.7 LSU during below average rainfall periods and at.

Phenological characteristics of 23 conspicuous plant species over a period of 12 months are described and discussed. The patterns observed are typical for southern Africa.

Recommendations are given for the ecological management of Sango Ranch. A stocking rate for the animals of Sango Ranch is suggested. Recommendations are given on veld management and the harvesting of selected plant species. The

adaptive management method is recommended for the ecological management of Sango Ranch. A monitoring program is suggested. It is recognised that the management guidelines presented are speculative due to the complex nature of natural systems and are only intended to be valid over a short period due to the dynamic properties of natural systems in southern Africa.

# 'N INVENTARIS VAN DIE NATUURLIKE HULPBRONNE VAN SANGO RANCH, SAVE VALLEY CONSERVANCY , ZIMBABWE

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## OPSOMMING

Verskeie ekologiese data is vanaf Januarie 1998 tot September 2000 op Sango Ranch, geleë in die Save Valley Conservancy in die laeveld van suidoos Zimbabwe, versamel.

Die fisiografie, geologie, klimaat, grondtipes, plantegroei, diere en geskiedenis van die Save Valley Conservancy is bespreek as agtergrond. Die missie en doelstellings van die Save Valley Conservancy en Sango Ranch is bespreek. Reënval en temperatuur data is geanaliseer en 'n klimatogram vir Sango Ranch is opgestel. 'n quasi 20-jaar reënval siklus is geïdentifiseer.

Na 'n oppervlakkige grondopname is die gronde in groepe geklassifiseer. Die gronde van Sango Ranch wissel van taamlik diep alkaliese vrugbare gronde tot vlak rotsagtige suurgronde.

Die Braun-Blanquet metode is gebruik om die plantegroei van Sango Ranch te identifiseer, klassifiseer en te beskryf. Nege plantgemeenskappe en 16 subgemeenskappe is beskryf. Die strookperseelmetode is gebruik om die plantegroeistruktuur te beskryf. Die plantegroei van Sango Ranch wissel van digte bos tot oop woud. 'n DECORANA ordening is toegepas en omgewingsgradiente is geïdentifiseer en beskryf. Ses bestuurseenhede is met die TWINSPAN klassifikasie afgelei en beskryf.

Die stappuntmetode is toegepas om die grasspesiesamestelling van Sango Ranch te verkry. Na 'n DECORANA ordening op die kruiddata uit die Braun-Blanquet opname, is 'n degradasie-gradient geïdentifiseer. Die gradient wissel vanaf erg oorbenut tot bykans onbenut. Twintig grasspesies is volgens hulle reaksie op weidingsdruk in ekologiese kategorieë geplaas. Die veldtoestand vir elke bestuurseenheid is bepaal met die Ekologiese Indeksmetode. Veldtoestand wissel van middelmatig tot goed.

Die biomassa van die kruidlaag is met behulp van die weiveldskyfmeter bepaal. Die biomassa van die kruidlaag van die bestuurseenhede wissel van 1 520 tot 5 092 kg per ha. Dit word aanbeveel dat die weiveldskyfmeter vir die gebied gekalibreer word. Dit sal toelaat dat meer akkurate opnames moontlik is.

Die BECVOL metode en rekenaarprogram is gebruik om die beskikbare blaarmateriaal te bepaal. Net 6.2 % van smaaklike blaarmateriaal is beskikbaar vir blaarvreters. Ekologiese kapasiteit is bepaal as die som van weikapasiteit en blaarvreetkapasiteit. Die GRAZE program (Bredenkamp pers. komm.)[13] lewer 'n ekologiese kapasiteit van 7 056 GVE tydens gemiddelde reënvalperiodes en 3 737.2 GVE tydens ondergemiddelde reënvalperiodes. Blaarvreetkapasiteit word op 651.4 GVE tydens gemmidelde reënval periodes beraam en word op 325.7 GVE tydens ondergemiddelde reënval periodes beraam.

Die fenologiese eienskappe van 23 kenmerkende plantspesies is oor 'n tydperk van 12 maande weergegee en beskryf. Die patrone is tipies vir suider Afrika.

Aanbevelings met betrekking tot die ekologiese bestuur van Sango Ranch is gebaseer op die data verkry tydens die studie en vanaf gepubliseerde literatuur. Aanbevelings vir veldbestuur en die oes van uitgesoekte plantspesies is voorgestel.

'n Wildlading is ook vir Sango Ranch voorgestel. Die aanpassingbestuurmetode en 'n moniteringsprogram word voorgestel. Dit word beklemtoon dat die bestuursriglyne wat hier voorgestel word, danksy die dinamiese eienskappe van die natuurlike sisteme van suider-Afrika, spekulatief is en slegs beskou moet word as korttermyn voorstelle.