

SUMMARY: The aims of the present study of Panthera pardus were to describe their diet relative to prey abundance, especially pertaining to domestic livestock in two farming areas of the Waterberg namely the Naboomspruit and Melk River areas. Space utilization and activity patterns of a male and female leopard were also investigated in the Naboomspruit study area. These data together with information gained with the translocation of five individual leopards, and experiments on different capture techniques, were used to propose a leopard conservation strategy in farming areas of the Transvaal with special reference to stock protection measures.

Different live capture techniques were investigated, whereby variations on conventional box-traps as well as modifications on gin-traps showed application potential.

The effective home range sizes of a radio collared male and female leopards were calculated at 303 km^2 and 157 km^2 respectively. Both leopards were not found in all parts of their home ranges, equally often. There were usually sectors of concentrated use. The male leopard in the Naboomspruit study area moved a mean distance of 8,6 km (range 0,6 - 21,5km) per diel tracking period. The female averaged a distance of 6,1 km (range 0,2 - 12,2 km) per diel tracking period. Radio tracking data together with spoor identifications showed a leopard density of one leopard per 53 km^2 .

Both leopards were predominantly nocturnal with some

crepuscular activity. In the male's total activity pattern scenario two peaks were apparent, the first during the period 18h00 to 19h00 the second from period 04h00 to 05h00. The female showed a sharp peak between 18h00 to 19h00 and 19h00 to 20h00. Peaks of activity were apparent throughout the night with a noticeable decline between 02h00 and 03h00.

The opportunistic feeding habits of leopards were also apparent in this study. In the Melk River study area, ungulate hair was found in 76,3 % of the scats, impala being the best represented at 33,3 %. Cattle hair was found in 2,5 % of the scats. In addition carcass observations showed that eight cattle calves were confirmed to have been killed by leopards. Ages of calves taken differed from new-born to 103 days old, with an average age of 22 days. Mammals other than ungulates featured in 35,8 % of the scats. In the Naboomspruit study area, 67,5 % of the scats contained the hair of ungulates, impala contributing 18,9 %. Leopards took 11 cattle calves over a period of 11 months (September 1986 - July 1987). The ages of the calves varied from new-born, to 90 days old, with an average of 21 days. Mammals other than ungulates featured in 40,5 % of the scats. Information recorded on prey capture and feeding behaviour (especially involving cattle calves) were used in the creation of a calf protection strategy.

Different aspects of leopard translocations i.e. post release movements, factors involved in preventing homing behaviour or factors that negatively influence an individual leopard settling in a released area, were investigated to determine the

feasibility of translocations to areas where they were partly or totally exterminated due to reasons which don't prevail anymore. However, in evaluating the feasibility of translocations in the Transvaal, it is important to examine the different criteria being used to enable possible justification or disapproval of the action. The two objects of a translocation to be fulfilled before it can be considered a success are first, a socio-economic commitment towards the landowner and secondly a conservation commitment towards the species. Socio-economic factors such as attitude of the people in control of the original area concerned, should be taken into consideration in that the "problem" must be solved. Translocation actions could be considered a success even though individuals had moved out of the area of release and settled elsewhere in the vicinity. As long as they could complement or strengthen a leopard population anywhere without being problem leopards. A problem leopard is therefore seldom suitable for translocation.

In the creation of a proposed leopard conservation strategy for the Transvaal an attempt was first made to estimate distribution and density of leopards in the Transvaal. By extrapolating information gained from radio collared leopards in this study and elsewhere in southern Africa a density estimate of 1642 individuals was made, outside the Kruger National Park, Independent States and selfgoverning States.

Although information on different aspects of gene flow of free ranging leopards is lacking, the leopard populations in

the Transvaal are currently to a large extent linked, which makes natural gene flow a possibility. Although suitable areas for leopards thus exist, these may not be available as homogeneous units in the future, due to increasing human pressure. It is therefore important to start concentrating on the monitoring of habitats providing leopards with strongholds. What is proposed is not to isolate these identified habitats which would comprise thousands of hectares as nature reserves, but rather request that they be reserved in the future as "nature areas" under the S.A. Plan for Nature Conservation, administered by the Department of Environmental Affairs in conjunction with the provincial authorities.

The leopard/cattle contact problem can to a large extent be overcome by adapting proper stock management to the threat. On farms where such measures are impractical, prevention of stock losses must be through supplementary actions such as physical barriers during high risk periods. The different applications of electrified fences showed potential. The leopard/game farm conflict will be solved by making the leopard more available for trophy hunting and thereby turning it into an economic asset. A strict well controlled scientifically based permit system, together with a licence system regarding the possession of leopard skins and trophies is however essential.

Different capturing devices being used to eliminate individual leopards (e.g. gintraps etc.) must also be made illegal and only used under controlled circumstances by authorized individuals, for the exclusive control of problem

leopards. Poison will always be available, the only option is to inform and educate landowners and the general public about the destructive effect of poisons on an ecosystem.

The implications of leopard conservation are greater than merely for aesthetical considerations. As the largest predator in most farming areas of the Transvaal, they have a definite functional role to play in balancing and stabilizing the different ecosystems. Leopard populations outside large sanctuaries in the Transvaal are not yet in danger of extinction, but it would be naive to think that they are stable or even increasing. Although prospects appear gloomy, farmers are sympathetic, and will cooperate if stock losses can be limited, and the game farm problem solved. The biggest long-term threat however to the future survival of leopards still is the reduction of their natural habitat. What is of importance is that we still have some time to experiment with our options to ensure the long term survival of these magnificent cats.

OPSOMMING

Die doel van hierdie studie van die luiperd Panthera pardus was om inligting in te win oor aspekte van voeding relatief tot die digtheid van prooi-spesies in twee boerdery gebiede van die Waterberg naamlik, die Naboomspruit- en Melkrivierareas.

Spesifieke verwysing is na die vang en voedingsgedrag van luiperds met betrekking tot beeskalwers gemaak. Verder is aspekte van ruimteberutting en aktiwiteitspatrone van 'n manlike en vroulike individu in die Naboomspruitstudiegebied ondersoek. Hierdie data tesame met inligting ingewin ten opsigte van die translokering van vyf luiperds, asook met die eksperimentering van luiperdvangtegnieke, is gebruik in die daarstelling van 'n voorgestelde luiperdbewaringstrategie vir boerderygebiede van Transvaal. Klem is in die strategie ook ondermeer op veebeskermingsmaatreëls gelê.

Variasies op bestaande vanghokke en slagysters is ook ondersoek vir die lewendige vang van luiperds in verskillende omstandighede.

Die effektiewe loopgebied van 'n manlike en vroulike luiperd wat van radionekbande voorsien is, is vasgestel op 303 km^2 en 157 km^2 respektiewelik. In beide individue is loopgebiede nie eweredig benut nie, en was daar areas van voorkeur benutting. Die manlike dier in die Naboomspruitstudiegebied het 'n gemiddelde afstand van $8,6 \text{ km}$ (variasie $0,6 - 21,5 \text{ km}$), en die vroulike dier 'n gemiddelde afstand van $6,1 \text{ km}$ (variasie $0,2 - 12,2 \text{ km}$) per 24 uur siklus beweeg.

Radio-opsporingsdata tesame met die identifisering van addisionele luiperds in die studiegebied dui op 'n luiperdigtheid van een luiperd per 53 km^2 in die Naboomspruitstudiegebied. Beide luiperds was oorwegend naglewend, maar het soms in die skemer aktiwiteit getoon. In die mannetjie se totale aktiwiteitsscenario was twee pieke opmerklik. Die eerste gedurende die periode 18h00 tot 19h00 en die tweede vanaf 04h00 05h00. Die wyfie het aktiwiteitspieke tussen 18h00 en 19h00 en weer tussen 19h00 en 20h00 getoon.

Die opportunistiese voedingsgedrag van luiperds was ook opmerklik in die studie. In die Melkrivierstudiegebied was die hare van hoefdiere in 76,3 % van die mismonsters teenwoordig, waarvan 33,3 % onder andere die van rooibokke bevat het. Beeshare is in 2,5 % gevind. Karkas ondersoek het verder getoon dat luiperds verantwoordelik was vir die vang van agt beeskalwers in die gebied.

Die ouderdomme van die betrokke kalwers het gewissel tussen pasgebore en 103 dae, met 'n gemiddeld van 22 dae. Nie-hoewige soogdiere was in 35,8 % van die mismonsters verteenwoordig. In die Naboomspruitstudiegebied het 67,5 % van die mismonsters die hare van hoefdiere bevat waarvan 18,9 % ondermeer rooibokhare bevat het. Elf beeskalwers is oor 'n tydperk van 11 maande (September 1986 - Julie 1987) gevang. Ouderdomme van hierdie kalwers het gewissel van pasgebore tot 90 dae, met 'n gemiddelde van 21 dae. Soogdiere anders as hoefdiere is in 40 % van die mismonsters gevind. Informasie met betrekking tot vang en voedingsgedrag van veral beeskalwers is in die

daarstelling van 'n kalfbeskerminingsstrategie gebruik (bees).

Verskillende aspekte van luiperdtranslokasies onder andere inisiele bewegings na vrylating, faktore wat terugkering beïnvloed/voorkom of 'n individu verhinder om in 'n gebied te vestig is ondersoek, om die lewensvatbaarheid van translokasies per se te bepaal. Die twee kriteria waaraan 'n translokasie-eksperiment moet voldoen alvorens dit 'n sukses kan wees is, eerstens 'n sosio-ekonomiese doelwit ten opsigte van die grondeienaar en tweedens 'n bewarings doelwit gerig op die spesie. Die sosio-ekonomiese doelwit behels dat die "probleem" verwyder moet word. 'n Translokasie poging kan dus as 'n sukses beskou word al beweeg die dier uit sy vrylatingsgebied, solank 'n luiperdpopulasie elders aangevul word, sonder om skade aan te rig. Probleemluiperds is dus selde geskik vir translokasie.

In die daarstelling van 'n voorgestelde luiperdbewaringsstrategie in die Transvaal, was dit ook nodig om meer inligting oor die verspreiding en getalle van luiperds te bekom. Deur gebruikmaking van inligting soos uit radio-opsporing in die Naboomspruitarea verkry, sowel as die ekstrapolering van navorsing elders in Suider Afrika, is 'n digtheidsberaming van 1642 individue gemaak. Dit geld vir gebiede in Transvaal (buite die Nasionale Krugerwildtuin en onafhanklike- en selfregerende state.

Alhoewel daar geen inligting oor die genevloei in luiperdpopulasies beskikbaar is nie, is die meeste luiperdpopulasies in die Transvaal in 'n groot mate verbind, wat dus genevloei 'n moontlikheid maak.

Alhoewel geskikte luiperdhabitat tans beskikbaar is, kan dit as gevolg van verhoogde ontwikkelingsdruk in die toekoms nie as homogene eenhede teenwoordig wees nie. Dit word dus voorgestel dat alle inligting oor luiperddigtheidsgebiede by die S.A. Plan vir Natuurbewaring, geadministreer deur die Departement van Omgewingsake in samewerking met Provinsiale owerhede, geïnkorporeer word.

Die luiperd/vee konflik kan tot 'n groot mate deur middel van doeltreffende veebestuursaksies opgelos word. Op plase waar sodanige maatreels onprakties mag wees, behoort veeverliese deur middel van addisionele (gedurende hoe risiko periodes) fisiese hindernisse beperk te word. Die verskillende toepassings van elektriese heinings het in die verband groot potentiaal getoon.

Die luiperd/wildboer konflik sal tot 'n groot mate opgelos word indien luiperds meer beskikbaar is as trofeediere en die se teenwoordigheid dus 'n bate vir die wildboer is. 'n Streng, gekontroleerde, wetenskaplik gebaseerde permitstelsel, tesame met 'n lisensiesisteen vir die besit van luiperdvelle en trofee is egter essensieel.

Verskillende vangapparate byvoorbeeld slagysters moet onwettig verklaar word en slegs onder gekontroleerde toestande deur gemagtigde individue vir die eksklusiewe eliminering van probleem luiperds aangewend word. Gifstowwe sal egter altyd beskikbaar wees en die enigste wyse om die probleem aan te spreek is om die grondeienaars op te voed oor die destruktiewe invloed van gifstowwe op ekosisteme.

Die implikasies van luiperdbewaring strek dus verder as slegs

estetiese redes. As die grootste roofdier in meeste boerderygebiede van Transvaal het luiperds 'n definitiewe funksionele rol in die balansering en stabilisering van die verskillende ekosisteme te speel. Luiperdpopulasies buite groot reservate is nie bedreigd nie, maar dit sal naief wees om aan te neem dat luiperdpopulasies stabiel is, of aan die vergraot is. Alhoewel vooruitsigte maar vaal lyk, is die meeste boere baie positief veral as veeverliese beperk en die wildboerkonflik opgelos kan word. Die grootste langtermyn bedreiging in die Transvaal is egter die verdwyning van luiperds se natuurlike habitat. Die belangrikste is egter, dat daar nog genoeg tyd is om met die verskillende opsies te eksperimenteer, om die langtermyn oorslewing van hierdie manjifieke katte te verseker.

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