Social organization patterns of several Feral horse and Feral ass populations in Central Australia

By R. Hoffmann

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The family Equidae has been the subject of several studies in the last few decades with particular attention to their social organization, behaviour and ecology. In general, two different types of social organization are found in the Equid species:

In wild asses *(Equus hemionus, E. africanus)* and the Grevy's zebra *(E. grevyi)* adult solitary males occupy and defend territories (Klingel 1972, 1973). Groups of mares and their offspring as well as bachelors graze in these territories, but do not necessarily form groups with territorial stallions. Mares in estrous are almost exclusively bred by the occupant of the territory in which they graze. Mares temporarily form large groups with other mares and their offspring. In feral asses *(E. asinus)* mares and foals show similar patterns of social organization (Moehlman 1974); stallions are solitary, but not always territorial.

In other zebra species *(E. quagga, E. zebra)* as well as in unmanaged feral horse populations *(E. caballus)* stallions and mares form stable "harem" groups (Klingel 1969; Joubert 1972; Tyler 1972; Feist and McCullough 1976; Berger 1977; Hoffmann 1980; Rubenstein 1981). They are stable in their composition and usually consist of one adult male and several females with their young offspring. Young males form temporary bachelor groups until they reach maturity. Except for possibly one case (Rubenstein 1981) all studies report that groups are not territorial. They usually have overlapping home ranges and share resources.

From this it could be assumed that contrary to wild and feral asses and zebras, the social organization of feral horses appeared to be rather inflexible independently from their environment (from semi-desert to subtropical), population size, population dynamics and length of feral state.

Therefore in March and April 1980 I conducted a two month pilot study on several populations of feral horses and asses in the McDonell Ranges in Central Australia, 180–250 miles west of Alice Springs, supplementing a 5-year research project on the behaviour and ecology of a feral horse island population in North Carolina, USA (Hoffmann, in prep.). The studied animals were descendants of livestock which had become feral at least 40–60 years ago, and had not been hunted for the last 20 years (Park Service, pers. comm.). The adjacent, but not overlapping homeranges of the different populations centered around artificial waterholes or stretched along dry "river" beds with several tiny waterholes. The distance which the animals covered on their daily migration to waterholes varied between 5 and 10 km. Daily observations were conducted from sunrise until sunset, with breaks during the midday heat. All animals were identified by face patterns, sex, age class, skin and maene color, maene fall and length, and peculiar patterns. Location, group size and group composition, identity, and migration was recorded daily, behavior patterns and social interactions were recorded continously.

The total population size of the asses was N = 60, their sex ratio was 1:1. In general, the asses showed a "loose" social organization similar to other feral ass populations. Mare and foal units were the smallest group types, sometimes accompanied by other mares, yearlings

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and stallions. Stallions were not territorial. Mares in heat avoided other mare groups and were followed by all adult and subadult stallions of the population, which frequently fought over breeding access to the mare.

The social organization of the 80 horses in two horse populations was very different from any other horse population studied so far: In one intensively studied "sub"population (n = 28) only three groups had a stable group composition over the observation period: two "harem" groups and one "harem" group with two stallions, none of which appeared to be subdominant to the other. The other members of this "sub" group lived in stable mother and foal units, as single horses and in unstable bachelor groups.

In all 80 horses, the following types of organization were observed:

Table

Observed frequencies of different organization types in feral horses in Central Australia

Organization type	harem group	2 ♂ harem group	super* group	single ♂	single ♀	♀ and foal group	bach. group
frequency	3	2	2	3	2	6	3

* supergroup: more than 2 males and 2 females in one group

Neither was any of the males or groups territorial, nor did any of the groups have exclusive home ranges or preferrably stay around the mutually used waterhole. Based on estimates of the age distribution in foals and yearlings, no distinctive breeding season in both asses and horses could be observed or expected.

Although the presented data are few and preliminary, they clearly indicate that the social organization of the investigated horse populations shows more similarities to the social organization of the adjacent ass population and other feral ass populations than to the social organization of any other horse population. I therefore would like to assume that the social organization and spatial patterns in feral horses are a. more flexible than previously thought, and b. under similar environmental conditions, at least in feral asses and horses may converge into similar patterns to some degree, thus possibly indicating some environmental impact.

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Literature

Berger, J. (1977): Organizational systems and dominance in feral horses in the Grand Canyon. Behav. Ecol. Sociobiol. **2**, 131–146.

Feist, McCullough (1974): Behavior patterns and communication in feral horses. Z. Tierpsychologie **41**, 337–371.

Hoffmann, R. (1980): Soziale Strategien einer Population von verwilderten Pferden *(Equus caballus)* auf einer Insel in N. C., USA. Diplomarbeit, Universität Tübingen.

Joubert, E. (1972): Activity patterns shown by mountain zebra *(Equus zebra hartmannae)* in South West Africa with reference to climatic factors. Zool. Afric. **7**, 309–331.

Klingel, H. (1969): Reproduction in the plains zebra, *Equus burchelli boehmi*: Behavior and ecological factors. J. Repr. Fert. Suppl. **6**, 339–345.

Klingel, H. (1969): The social organization and population ecology of the plains zebra *(Equus quagga)*. Zool Afric. **4**, 249–263.

Klingel, H. (1972): Social behavior of African equidae. Zool. Afric. **7**, 175–186.

Klingel, H. (1972): Das Verhalten der Pferde (Eqidae). In Kükenthal/Krumbach, Handbuch der Zoologie VIII, 10. Teil, 1–68. Berlin: de Gruyter.

Moehlman, P. (1979): Behavior and ecology of feral asses *(E. asinus)*. Ph. D. thesis Univ. of Winconsin.
Rubenstein, P. (1981): Behavioral ecology of Island feral Horses. Equine vet. J. **13**, 27–34.
Tyler, S. (1972): The behaviour and social organization of the new forest ponies. Anim. Behav. Monog. **5**, 87–196.

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BEKANNTMACHUNGEN

International Symposium on Systematics, Phylogeny and Evolutionary Ecology of African Vertebrates

The Zoological Research Institute and Museum Alexander Koenig, Bonn, FRG celebrates its 50th anniversary in May 1984. During May 15–18, 1984 a symposium will be held covering a broad range of topics on African vertebrates (with special emphasis on reptiles and birds). A detailed program will be available in October 1983.

Participants are invited to present recent investigations on African taxa or taxonomic groups. Guests are also welcome. For details contact: Dr. Karl-L. Schuchmann, Dept. of Ornithology, Zoological Research Institute and Museum A. Koenig, Adenauerallee 150–164, D-5300 Bonn 1, FRG.

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The IV ITC will take place August 13–20 1985 on the campus of the University of Alberta in Edmonton. The purpose of this notice is to solicit names for a preliminary mailing list of potential participants, and to request comments and suggestions.

The names of all who attended any of the first three congresses will be placed on the provisional mailing list for IV ITC, but, if your address as listed in the Transactions of the Congress you attended is no longer correct, please send a current address.

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