

B. Original Articles

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Free Living European Bisons**Bisoniana XXIV**

[With 1 Table and 5 Figs.]

The first two European bisons were released from the reservation into the Białowieża Forest in 1952. Subsequently more animals were released; a total of 38 (14, 24) bisons until the end of 1966. In 1958 the herd began to increase by reproduction. Until the end of 1966 ninety eight (52, 46) calves were born in the free living herd. There was a slight preponderance of males (53.06%). During this period the herd decreased by 17 (11, 6) animals: 12 (6, 6) died and 5 (5, 0) were put back into the reservation. At the end of 1966 there were 119 (55, 64) free living bisons. The mortality in this herd was 9.16% of which the mortality of calves amounted to 2.29%. The herd of European bisons was increasing the range of penetration from year to year but then became stabilised in a definite area of three Forest Districts. However, the bulls were making long journeys in search of new stands but leaving the Forest was observed only in one case. In winter the bisons remain in the vicinity of feeders. They stay there on the average for 155 days, i.e., from November 15 till approximately April 20. After leaving the feeders the bisons divide into herds numbering 6—20 animals usually (maximally 34 heads). Given herd penetrates a limited area of about 30 km².

I. INTRODUCTION

Some data on ecology of European bisons can be found in papers published in the 19-th and beginning of 20-th century (Brincken, 1826; Karcov, 1903, Kulagin, 1919; Wróblewski, 1927). These data can be a very useful reference in the study of changes of the European bison during its period of »domestication« in reservation breeding. The present paper presents a summary of observations on bisons which for 14 years (since 1952) live free in the Białowieża Primateval Forest. Continuation of these observations and studies should bring detailed information on the ecology and biology of the European bison.

II. METHODS

The European bison released into the forest were systematically observed by gamekeepers and all observations recorded in notebooks. Most of the data collected this way concerned the number and location of the bison and there was very little other information. However, approximately 600 observations were recorded resulting in sizable statistical material. Besides, the author made about 80 observations himself and these were far more complete.

Observing free living European bison became progressively more and more difficult with the passing of years and growth of the herd. Some data could not be obtained, for example the exact date of calving of a given female. However, the total number of calves born in a given year and their sex can be, as yet, precisely determined. This is done mainly during winter when all bison are coming to the feeders.

In the Białowieża Forest free living bison are given supplementary food during winter. Feeding was started during the second winter after the first animals were released, i.e. in 1954. First the bison were fed at deer feeders, while in 1958 special feeders were made. They were located in the vicinity of breeding reservation and not very far apart from each other (up to 3 km) in sections 390, 422 and 391 (since 1960) (Fig. 1). The location of feeders undoubtedly influences both migrations and size of herds of European bison during winter.

Consequently, a year can be divided into two distinct periods (1) summer wanderings and (2) winter supplementary feeding. Only observations collected during the former period were considered a legitimate basis for study of migration, social organisation, size and structure of the herd. Results of winter observations quoted below were not included in the analysis of these problems.

The reproduction of free living bison is not discussed in the present paper as it will be described in a separate publication (Krasiński & Raczynski, 1967).

III. CHANGES IN THE SIZE OF THE HERD FROM 1952 to 1966

The two year old bulls which were to be the first released European bison »Pomruk« (pedigree No 816) and »Popas« (pedigree No 817) were placed in a large 80 ha enclosure in which there was an abundance of different food. To get them used to finding food on their own they were not given any additional food for four and a half months. Then the enclosure was opened and the bison left it on September 13, 1952. This day marks the beginning of renewed free breeding of European bison in Białowieża Primateval Forest. As the reservations are located centrally in the forest it was not necessary to transport the animals to proper areas.

In spring of the following year the two year old cow »Poręba« (pedigree No 812) was released and on June 7 the five year old cow »Pojata« (pedigree No 735) was added together with its three week old male calf »Podarek« (pedigree No 897).

There were no changes in 1954. In 1955 two year old cow »Pogodna« (pedigree No 910) was added to the free living herd and on August 25 two bison were caught and removed from this herd: cow »Poręba« and the aggressive loner bull »Pomruk«.

In 1956 bull »Podarek« left the herd, and wandering alone crossed the state border and subsequently left the Forest. He was caught on November 27 and placed in the

reservation. As »Pojata« which was fertile while in the reservation did not calve in the free living herd it was suspected that bull »Popas« may be sterile. Therefore this bull was caught in April 1957, returned to the reservation and in the same month replaced by an 8 year old male »Polel« (pedigree No 762). »Popas« must have

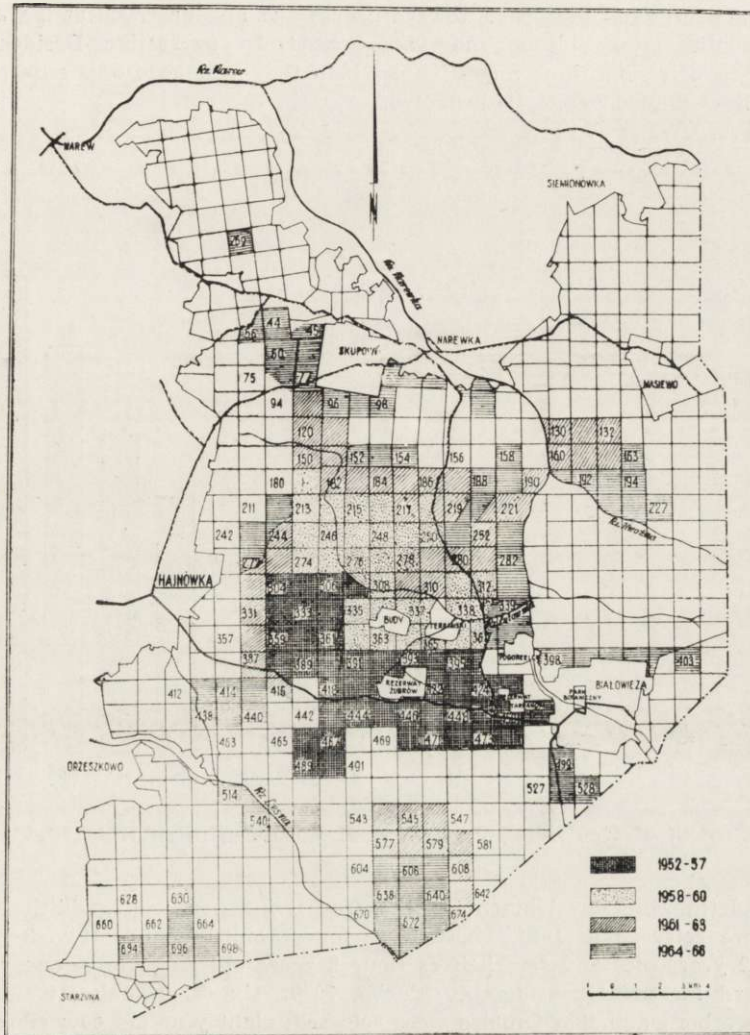


Fig. 1. Spreading of the herds of free living bison in western part of Białowieża Primaevial Forest.

really been sterile as in May 1958 two male calves were born (»Podstoli«, pedigree No 1133 and »Poleśny«, pedigree No 1134), both fathered by »Polel«. Three year old cow »Południca« (pedigree No 940) was released from the reservation together with »Polel«. »Poreba« was covered in the reservation by bull »Podbipięta« (pedigree No 738) and released together with the latter two bison. Then, on July 1957 she

gave birth to a female calf »Potyczka« (pedigree No 1078). In this way, after a break of 40 years, European bisons began again to reproduce in natural conditions in the Białowieża Forest.

Until 1958 there were only 2 to 6 European bisons free in the Forest and they were observed to determine their fate in present environmental conditions of the Forest. The attitude of the bisons toward people was also observed as it was feared that reservation-grown bisons may be excessively aggressive. Besides, it was necessary to determine how much human help they will need and especially how much additional food has to be provided.

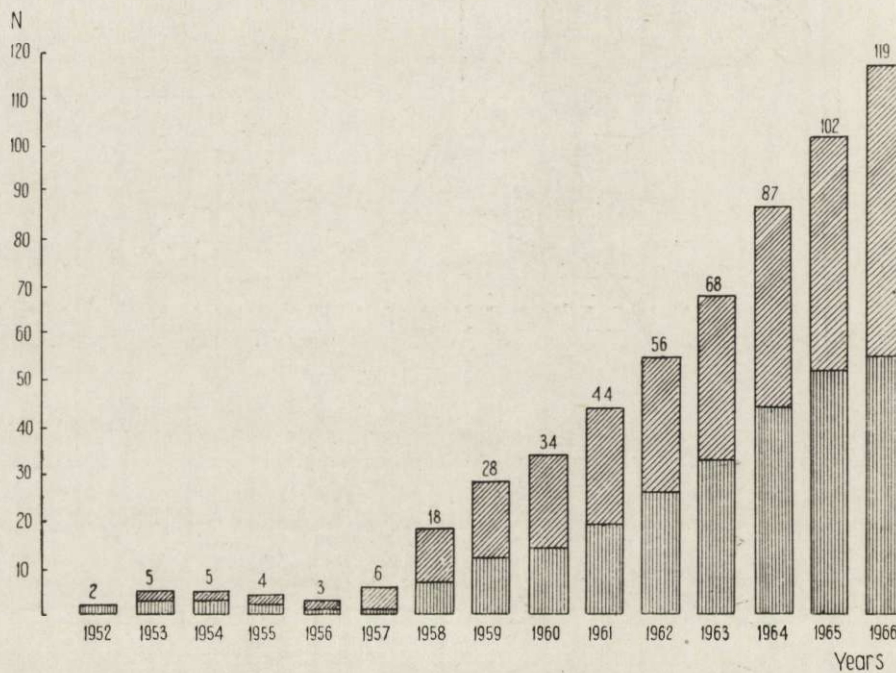


Fig. 2. Growth of free living population of European bison from 1952 to 1966.

To accelerate the development of the free living herd nine additional young bisons were released in 1958. These were four promising bulls (two 3 years old and two 2 years old) and five heifers (four 2 years old and one — one year old).

The herd increased considerably during 1959: six (5 — males, 1 — females) calves were born and five females were released: eight year old cow »Pogoń«, and four one year old heifers, »Podolanka« (pedigree No 1137), »Pograniczna«, (pedigree No 1144), »Pomyłka«, (pedigree No 1145) and »Podobna«, (pedigree No 1146). In the same year there was also the first natural loss in the free living herd; three year old heifer »Pochodnia« jumped a fallen tree, and was badly hurt in the vicinity of the sternum and died.

From 1959 on there are real herds of European bisons living in the wild. Until the end of 1966 a total of 38 (14, 24) bisons was released from the reservation and 93 (52, 46) were born in the free living heard.

The decrease was 17 (11, 6) animals of which 12 (6, 6) died and 5 (5, 0) were brought back to the reservation. The changes of the free living herd are given in Fig. 2.

Releasing bison from 1960 to 1966 was done only for the benefit of reservation breeding. This was probably not right as it was later found that releasing adult bison (both cows and bulls, especially inferior ones) is rather pointless. These animals do not join herds living free for some years.

IV. THE STRUCTURE OF THE EUROPEAN BISON POPULATION

1. Age structure

According to data of Roskosz (1958) the physical development of European bison as measured by bone growth takes 5 to 6 years in the female and 6 to 7 years in the male. Different bones stop growing at the age of 3 to 7 years in the female and at the age 4 to 8 years in the male. These data concern bison from reservations.

In breeding practice the age of 4 years is the border between juvenile and adult bison. The physical development of a four year old European

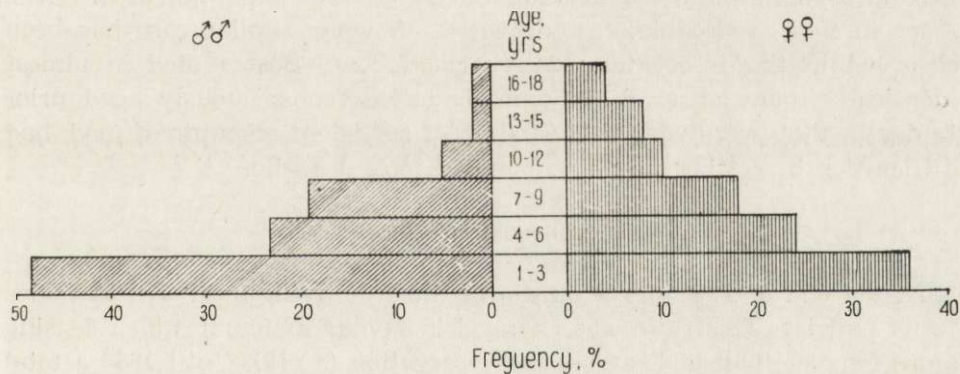


Fig. 3. Age structure of free living population on January 1, 1966.

bison is not yet completed but it is fully grown and capable of reproduction. Therefore 4 year old animals can be considered adult. According to this classification on January 1, 1967 there were 69 (31, 38) adult bison (57.98% of the total) and 50 (24, 26) young bison (42.02% of the total). Of juvenile animals 16 (10, 6) or 13.45% were 3 years old, 15 (9, 6) or 12.61% were 2 years old and 19 (5, 14) or 15.96% were 1 year old (Fig. 3).

From the total number of free living bisons 92 (47, 45) or 77.31% were born in the wild and 28 (8, 19) came from reservations. Consequently, the structure of the herd was partially artificial. Further independent development will result in a herd of constant age structure characteristic for the free living European bison population.

The short history of our free living herd does not allow to determine the life span of European bisons living in the wild. Wróblewski (1927) on the base of *post mortem* examinations concluded that bisons can live up to 35 years and that the opinion that they can live up to 50 years is exaggerated. It is possible that some bisons lived longer in natural conditions but the data of earlier authors differ considerably, are not well substantiated by facts and should be considered with some reservations. Of the 67 bulls registered in the pedigree books by Jaczewski (1958) only 3 animals or 4.5% lived over 20 years. The oldest bull lived 23 years. Of 66 cows 11 or 16.5% lived over 20 years, and 4 or 6.5% lived over 25 years. These four oldest cows died when 26 years old.

Since the beginning of free breeding no losses due to senile age were observed. However, the advanced age must have contributed to the death of 16 year old bull »Podbipięta« in 1964. In spite of the swampy ground a young bison would undoubtedly be able to get out of the little river in which »Podbipięta« drowned. A very similar case has been observed in the reservation: 24 year old cow »Beste« died in almost identical circumstances. Both animals looked conspicuously aged prior to death; they were very thin in spite of sufficient amounts of food, had difficulties in getting up and generally looked senile.

2. Sexual structure

At the end of 1966 the sex ratio in the free living herd was 55 males to 64 females. This ratio was changed in favour of females by releasing more females than males from the reservation (8 : 19). Until 1966 a total of 98 calves were born in this herd of which 52 or 53.06% were bulls. The sex ratio of calves born in individual years was the following:

1957 — 0:1,	1958 — 2:0,	1959 — 5:1,	1960 — 3:3,	1961 — 6: 5,
1962 — 4:4,	1963 — 7:6,	1964 — 10:6,	1965 — 9:6,	1966 — 6:14.

Karcov (1903) and Wróblewski (1927) reported that more bulls than cows are born and Büchner (1900) considered it one of the symptoms of European bisons degeneration contributing significantly to the extinction of this species. However, tabulations of Jaczewski (1958) based on pedigree books and covering many years indicate that

the sex ratio at birth is 1:1. There was even a slight prevalence of females (280 females and 271 males). This indicates that the sex ratio of calves in reservations is 1:1 when many years are considered. Obviously in individual years there are some random fluctuations. Some authors assume that more females may be born when the environmental conditions are better (Jazan, cited after Jurgenson, 1964).

In reservation breeding the ratio 1 bull to 4 cows was arbitrarily assumed to be the best (Ścibor, 1960). However, this can not be a base of possible regulation of sex ratio among free living bisons. Accepting this ratio would mean that about 70% of the bulls are redundant. When there is an excess of bulls natural selection can operate and in mating seasons the herds are won by the best bulls. The analysis of elk populations in different parts of Estonia indicated that the fertility of females is higher in regions where males are more numerous (Jurgenson, 1964). It appears, that at least in the earliest period of free breeding, only vicious, diseased, crippled or obviously faulty bulls should be eliminated.

At the end of 1966 the productive part of the population i.e. mature females amounted to 31.94% of the animals, adult bulls — to 26.05% while young males to 21.84% and young females to 20.17%.

V. MORTALITY

The mortality in the free living herd during the whole period of its existence (1952—1966) was 9.16%. Closer analysis indicates that this per cent should still decrease. Namely, the death of bull »Podbipięta« and two cows »Polatucha« and »Plamka II« can not be legitimately included in the statistics of the free living herd. These animals were doomed to soon death in the reservations because of advanced age or disease and were released shortly before their death. Low mortality of calves less than one year old is rather striking: during the whole period only 3 (3, 0) or 2.29% of the calves died. Their death was caused by mechanical injuries inflicted by other bisons. It is worth mentioning that there were no infectious diseases in the free living herd. Their occurrence can not be excluded in spite of preventive measures and rigid prophylaxis.

VI. MIGRATIONS

Free breeding provided an opportunity to follow the wanderings of bison from the very beginning and to observe their expansion into most

of the Forest area. With the growth of the European bison herd the area penetrated by it was increasing from year to year (Fig. 1). In the first period only two young bulls were free in the Forest. One of them, »Pomruk« was making far wanderings and this accounts for a considerable

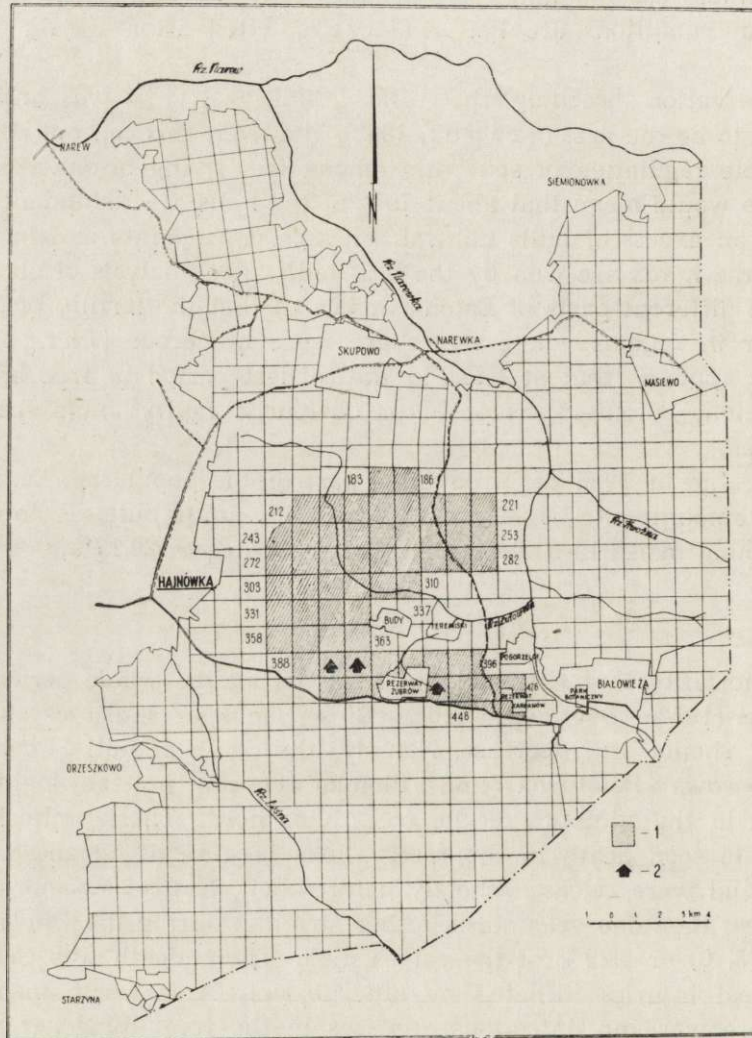


Fig. 4. The area most frequently penetrated by free living bison in the Białowieża Forest. 1 — main stands, 2 — feeders.

able area of Forest penetrated by bison in this early period. More interesting however, seems the spreading of the main herd of European bison which was increasing its range every year during the first period and in more recent years tended to occupy a stable region (Fig. 4).

Karcov (1903) indicated that the bisons are very attached to their stands and do not leave them without an important reason. This concerned also single bisons.

Bulls, especially young ones have much more initiative in looking for new stands and they were always the first bisons to appear on remote new areas. Presently in the distance from 10 to 20 km from the feeders (which can be considered a central point), i. e., in the peripheral Forest Districts only groups of bulls are present. In the Forest District Lacka Puszcza 12 km from the feeders bisons appeared in 1963. It was a group of bulls from 2—6 of different age. Similarly in the Forest District Browsk only 2—6 bulls were observed.

The movement of bison herds was originally definitely to the north. Only small groups of bisons could be observed south of the reservations and only in sections neighbouring reservations. Only in 1964 the presence of young bulls was reported in the Forest District Starzyna, on the southwestern edge of the Forest. This group of bisons and 2 bulls from Lacka Puszcza did not approach the feeders in winter 1964/65. A small group of European bisons was also observed in the Forest District Leśna and Białowieża. These were also mostly bulls.

The above observations indicate that only the bulls make relatively far migrations in search of new stands, while the cows with youngsters remain in preserves, in our case in Forest Districts Zwierzyniec, Hajnówka and Narewka. These are the same stands which were occupied by the bisons before the first world war — they probably have the proper type of deciduous, mixed and humid woods.

The wanderings of bulls were considered very important by Karcov (1903). He thought that they prevent mating within the same herds and allow addition of »fresh blood«. Bulls also have their stands in which the same animals can be observed every year. They specially like to walk on roads and often one can observe tracks of a single bull for several hundred meters.

During four month the two bulls which were first released, »Popas« and »Pomruk« were wandering together in the nearest neighbourhood of the reservation often approaching the fence. After the first larger snow in the first half of December they approached the village of Teremiski some 3 km north east from their previous stand. In January 1953 the bisons parted. »Popas« crossed the river Łutownia and moved for about 10 km to the north-west, after a few days returned to Termiski and then again approached the reservation. »Pomruk« after parting with »Popas« moved about 2 km north from Termiski and his stand was about 10 km². Three more European bisons which were next released joined »Popas« forming one herd. Similarly, they penetrated some 10 km² around the breeding reservations.

The single bull »Pomruk« was as old as the with the herd remaining »Popas«

but was much more mobile. He was often moving from place to place covering over 10 km of distance, while »Popas« with the herd was not leaving his stand.

Young (2 year old) bull »Podarek« left the herd in June 1955 and was wandering alone for 2 months without moving too far from the herd. Then he joined the rest of the bisons but left again in October. This time he moved 12 km away from the herd. At the beginning of November he again joined the herd for two weeks and on December 10 he joined it apparently for good. However in the autumn 1956 the three year old »Podarek« left the herd and started a lonely journey toward the east eventually leaving the Forest. To date it is the only case of a bison leaving the Forest.

Early in November the bisons begin to approach the feeder. The first herds come to the feeder about November 15. Usually it occurs after the first larger snow fall. Bulls and especially the weaker ones often remain close to human settlements and eat the hay of haystacks in meadows or near houses. Only when the hay is taken away they have to come to the feeders. During the first two weeks the bisons move up to 1.5 km

Table 1.

The time spent by free living bison at feeders, 1958—1965.

No. of feeder	422		390		391	
	A	D	A	D	A	D
1958/59	3. XII	4. IV	26. XI	30. III	—	—
1959/60	27. XI	20. IV	26. XI	10. IV	—	—
1960/61	10. XI	5. IV	18. XI	5. III	18. XI	5. III
1961/62	25. XI	20. IV	15. XI	20. IV	15. XI	20. IV
1962/63	10. XI	20-30. IV	10. XI	20. IV	10. XI	20. IV
1963/64	10. XI	30. IV	20. XI	30. IV	20. XI	30. IV
1964/65	2. XI	25. IV	20. XI	25. IV	20. XI	25. IV
1965	15. XI	—	15. XI	—	15. XI	—

Note: A — arrival to the feeder, D — departure from the feeder.

away from the feeders but later during the winter their tracks can rarely be observed farther than 500 m from the feeders. Only sporadically they migrate farther, to the wood clearings but then they beat a path in the snow (Table 1).

Beginning in the middle of March the bisons move several hundred meters from the feeders and intensively bark trees. Adult bulls begin to moult and look for uprooted trees and trees suitable for hackling. However, all bisons come regularly for feeding. In early April bisons can be seen by the feeder less and less frequently. But they still do not go far and return on the voice of a gamekeeper. In middle April they come to the feeder once in 2—3 days during the night and do not eat all the hay. Usually about April 20 they definitely leave the feeders. A few days later they can already be observed in their forest stands.

These data clearly indicate that the winter stands of bison herds and the range of their migration depend on the number and location of feeders.

Wanderings during summer are related to the abundance of food in given locality. However, the area penetrated by given herd is limited, approximately 30 km². Kulagin (1919) reported that European bisons can move daily over 5 versts (1 verst = 1066 m). According to our data the free living herd moves approximately 1—3 km daily but often the bisons remain for several days in one section (100 ha). It was observed that once the herd travelled over 7 km during the day and single bulls may cover over 10 km daily.

In the environment of the Białowieża Forest European bisons are resident animals and do not make seasonal migrations which were observed in Caucasus bisons (Filatov, 1912, cited after Kulagin, 1919).

VII. SOCIAL ORGANISATION AND STRUCTURE OF THE HERD

1. Social organisation

Wróblewski (1927) describes the herd of European bisons as a family linked by ties of kinship and operating on the base of solidarity and hierarchy. As indicated by repeated observations of free living bisons, the herd is usually lead by the oldest and most experienced cow. It may be explained by the fact that adult bulls leave the herd after mating season (Karcov, 1903).

Mature bulls are in the herd only during the mating season. But then the bull also does not lead the herd but moves rather passively, usually at its end. Bulls join the herds late in July and stay with them until the beginning of October. During the rest of the year they migrate independently from the herds. Old bulls (over 10 years of age) do not approach herds even during mating season and live alone, often at considerable distance.

Recently no fights of bulls were observed during mating season in Białowieża. Usually the stronger bull chases away the weaker ones which are following the herd. This however does not exclude that weaker young bulls (4—5 years old) may cover some of the cows.

In the period of calving (May and June) small groups of bisons are frequently observed. These are females leaving the herd and looking for a quiet place to have their calf. After the birth they join the main herd and the calves do not allow it to be broken into smaller groups.

In winter European bisons gather at the feeders. Old bulls are observed at one of the feeders while cows and youngsters at the other.

When the third feeder was built a herd of cows and youngsters (29 heads) was moving daily from one feeder to another covering a distance of 1 km. At the »bulls feeder« originally only three bisons were observed (»Polel«, »Poranek« and »Polas«). Sterile »Pościg« and the weakest »Poczet« remained separate. Large concentration of bisons at the feeder was observed in the herd of cows and youngsters and had some deleterious effects. Not all bisons could benefit sufficiently from the feed; young and weaker animal were being driven away. During this period it is difficult to talk about a social structure of the herd. This was also pointed out by Karcov (1903) and Wróblewski (1927) who were making their observations when free living bisons were already given supplementary food. The size of the herds, their number and spacing all depend on the location of the feeders.

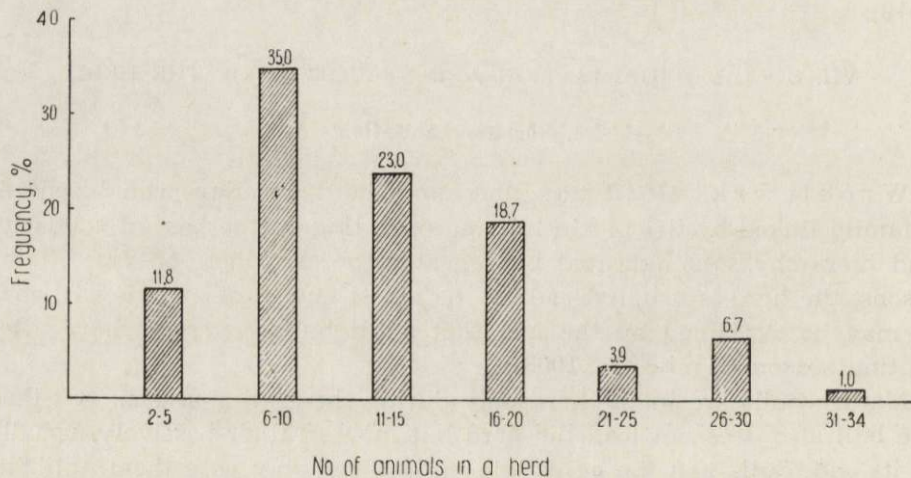


Fig. 5. The size of European bisons herds. The frequency was computed from 492 observations made exclusively during the period from April to November.

2. Structure and size of the herd

In the Białowieża experiment it was followed how the structure and the size of the herd was changing with the increase of total number of free living bisons. Until 1958 the European bisons were forming one herd and only bulls were making far wanderings. In spring 1958 an additional 10 (4, 6) young bisons were released: 2 three year old animals, seven 2 year old and 1 yearling. In May two calves were born and the total number of bisons reached 18 (7, 11) heads. During summer bisons were moving usually together but the division into two herds was already noticeable. Nine year old bull »Polel« was in one and three year

old »Poranek« in the other. The composition of both herds was unstable; they were moving close to each other and there was an exchange of animals. Often they were merging into one herd. During mating season »Polel« was driving away three year old bulls »Poranek« and »Polas« and they were following the main herd at a distance of 100—400 m. Later on there was more isolation between the herds but their structure and size was not stable, in accordance with observations of Wróblewski (1927).

The size of the herd was changing from several to 34 animals (Fig. 5). Larger herds were never observed during summer. Most often (76% of the cases) observed herds had 6—20 heads. The data of other authors are in close agreement with these observations; Kulagin (1919) reported 5—13 animals in a herd, Wróblewski (1927) 7—18, Karcov (1903) 15—18 and Brincken (1826) 10—40.

VII. CONCLUSIONS

Full restitution of the species *Bison bonasus* is possible only in the wild where these animals can live according to their instincts and the laws of nature. The first step in this direction has been made. The bisons are living free for seven years now, disregarding the first preliminary period. The results of free breeding speak for themselves; the herd is increasing and all animals are in good shape.

Presently it seems justified to talk about raising bisons in the wild as in contemporary environmental conditions of the Forest the raising of any game and especially the bisons is impossible without limited human interference. Feeding, constructing feeders, watering places and planting feeding plots seem necessary as well as the elimination of sick and vicious animals.

For nearly 100 years European bisons were raised in artificial environment of Zoos and enclosure. During such a long period some symptoms of domestication must have appeared.

During the relatively short time of free breeding in Białowieża the first changes of behaviour of European bisons can be observed. They can be described as gradual »turning wild«. It is especially noticeable in young animals born in the free living herd. For example the tracking of these animals (especially young ones) is becoming increasingly difficult. Sensing the approach of man these bisons try to move quickly into a safe place, while in the beginning of free breeding bisons were standing for a long time and watching the man.

Presently there is a need for new feeders, watering places and salt licks to prevent excessive concentration of bisons in the Forest both in

winter and in summer. Some concentration of bisons can be observed already in the vicinity of water (for example by the Łutownia river).

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Streszczenie

Praca niniejsza jest próbą podsumowania dotychczasowych obserwacji poczynionych nad żubrem przebywającym na wolnym terenie Puszczy Białowieskiej już od 14 lat. Utworzenie stada wolnościowego miało ogromne znaczenie dla restytucji tego gatunku, jak również pozwoliło na prowadzenie obserwacji, które przyczynią się do dokładniejszego poznania biologii i ekologii żubra.

W warunkach Puszczy Białowieskiej żubry bytujące na wolności w okresie zimowym są dokarmiane przy trzech specjalnie zbudowanych paśnikach położonych w pobliżu rezerwatów hodowlanych w niewielkiej odległości od siebie (do 3 km). Za okres zimowy przyjęto czas korzystania przez żubry z siana, który wynosi średnio — od 15 XI do 20 IV (Tabela 1). Żubry w tym okresie grupują się w pobliżu paśników, rozmieszczenie których rzutuje na migracyjność i wielkość stad żubrzych, dlatego przy rozpatrywaniu tych zagadnień wzięto pod uwagę jedynie obserwacje z okresu letniej wędrówki.

Pierwsze dwa żubry wypuszczono z rezerwatu na wolny teren 13 IX 1952 roku. W następnych latach wypuszczono dalsze sztuki, do końca 1966 — łącznie 38 (14,24). Od 1958 roku stado zaczęło się również powiększać drogą naturalnego przyrostu. Do końca 1966 roku urodziło się na wolności 98 (52,46) cieląt. Ubyło w tym okresie 17 (11,6), z tego padło 12 (6,6) żubrów, a odłowiono z powrotem do rezerwatu 5 (5,0). Stan na koniec 1966 roku wynosił 119 (55,64). Stado w 77,31% składa się z żubrów urodzonych i wychowanych na wolności (Ryc. 1).

Stosunek płci rodzących się cieląt za cały okres hodowli wykazał nieznaczną przewagę samców — 53,06%.

Śmiertelność w stadzie wolnym za lata 1952—66 wyniosła 9,16% w tym śmiertelność cieląt do 1 roku — 2,29%.

Na koniec 1966 roku produktywna część populacji — dojrzałe samice — stanowiła 31,93% pogłowia, dorosłe byki 26,05%, a młodzież 42,02% (Ryc. 2). Dalszy samorzutny rozwój wpłynie na ukształtowanie się stada o pewnej stałej strukturze wiekowej charakterystycznej dla wolnej populacji żubrów.

Stado żubrów w pierwszym okresie rok rocznie powiększało zakres swojej penetracji (Ryc. 3), aby w ostatnich latach ustabilizować się w stałym rejonie trzech Nadleśnictw (Hajnówka, Zwierzyniec i Narewka — Ryc. 4). Byki natomiast w poszukiwaniu nowych ostoj odbywają dalekie wędrówki, ale tylko w jednym wypadku zanotowano wyjście poza obręb puszczy. Wędrówki stad żubrzych w okresie letnim związane są z obfitością pokarmu w danym terenie, ale obszar jaki penetruje określone stado jest ograniczony i wynosi około 30 km².

Wielkość stad jest zmienna, najczęściej (76% przypadków) spotykano stada liczące od 6 do 20 sztuk. Maksymalnie naliczono w stadzie 34 sztuki (Ryc. 5).

W ciągu stosunkowo niedługiego okresu obecnej hodowli wolnościowej już daje się zauważyć pewne zmiany w zachowaniu się żubrów, które można określić jako stopniowe „obdziczanie”. Jednak w obecnych warunkach wydaje się konieczna ograniczona ingerencja człowieka, a mianowicie zimowe dokarmianie, budowa wodopojów, zakładanie poletek karmowych czy eliminacja sztuk niepełnowartościowych — chorych czy złośliwych.