

The Brown Bear in Poland: its History and Present Numbers

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The brown bear, *Ursus arctos* Linnaeus, 1758 was exterminated all over lowland Poland and in Sudety Mts. remaining only in Carpathian Mts. where its range declined further till the World War I period. A small population survived within some isolated sites and started to grow again after the World War II with its territorial expansion markedly accelerated since the seventies. The number of brown bears in Poland increased 4—5 times within 1945—1982 period. The population number in 1982 was estimated at 70—75 individuals. In early eighties four permanent refuges were known within Polish Carpathian Mts.: Żywiecki and Wysoki Beskid, Tatra Mts., Sądecki Beskid, and Bieszczady Mts. Most of the dens were found within these four refuges. The reproduction of brown bears is restricted to their permanent refuges. The estimated number of young for 1980—1982 period stood at 12—14 (with average of 1.4 cubs per female).

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1. THE AIM OF THE STUDY AND THE MATERIAL USED

The aim of this study was to review tentatively the body of knowledge of the history of the brown bear (*Ursus arctos* Linnaeus, 1758) in Poland, its reproduction, population dynamics, and also to assess critically the principles of its protection applied so far.

The material comprised returns of three questionnaires sent to forest districts in Carpathian Mts., and to selected national parks. The surveys were carried out in 1963 and 1976 by the Mammals Research Institute at Białowieża, and the 1982 survey by the Nature Conservation Research Centre, both of Polish Academy of Sciences. The questionnaires of 1982 survey were supplemented by correspondence with many respondents. The questionnaires of 1965 survey pertained to all *Carnivora* while those in 1976 and 1982 dealt only with brown bears. The returning rate of two last surveys reached almost 100%.

Any survey by questionnaires bears a certain error which is difficult to assess especially when the species under consideration is as rare and migrating as the brown bear is. The sources published in Poland so far,

apart from a report by Buchalczyk (1980), does not include any comprehensive study on the species. Therefore, in spite of obvious shortcomings of a questionnaire-based study we decided to publish its outcome.

2. RESULTS

2.1. The Brown Bear in Poland Before the Turn of the 19th Century

The brown bear has once occurred throughout Poland. It was a popular game animal hunted for its meat and skin, although as early as in the 12th century bear hunting became an exclusive privilege of Polish monarchs as reported by Vincent "Kadłubek" in his chronicle written in 1202. This rule was not strictly observed and bears become rarer as a result of extermination. By the 17th century bears were quite rare in many provinces of Poland. This may be inferred from notes describing cases of killing bears as extraordinary events (Moszyński, 1939). The information about exterminating last individuals in lowland Poland dated from 18th century. Thus, last bears vanished from various parts of Pomerania within 1733—1772 period, from Bydgoszcz Province in 1789, from East Prussia in years 1727—1747, while from Romincka, Borecka, and Piska Forests — in 1788, 1800, and 1804 respectively (Fengewisch, 1965). In the "Polish Kingdom" established after 1812) the brown bears must have been rare indeed since some reports from 1830 mentioned a complete extinction of bears from its territory except in Białowieża Forest (Kobyłański, 1939). In the former Łódzka Forest, at Radom, bears were killed as late as in 1867 (Kosman, 1934) while the last bear in Kielce Province was killed between 1828 and 1830 (Sztolcman, 1918). Surdacki (1977/78) reported that last bears within Lublin province had been killed at the turn of the 17th century. Also in the lowland part of Silesia, the last bears were killed in forests north of Opole in 1715—1750 (Pax, 1921; Simon, 1927), and near Lwówek Śląski — in 1726—1736 (Fengewisch, 1963). The last refuge of bears in lowland Poland was that of Białowieża but again here the last individuals were killed in 1873—1878 (Karpiński, 1949). Also in Sudety Mts., bears were exterminated before the end of the 18th century. The landlords in Kłodzko paid rewards for killed bears; the last bear there was killed in 1664 (Muszyński, 1939). The bears survived somewhat longer in the western part of Sudety Mts. In the Polish slopes of Karkonosze Mts. bears were hunted till 1756, and last tracks were reported in 1777 while on the Czech side of the border, the last bears were killed at the beginning of the 19th century (Stec, 1963). In the Izerskie Mts. bears were hunted till 1783 (Stec, 1963). The most prolonged period of bear hunting is reported from

Jeseniki mountain range, but this involved animals migrating from Carpathian Mts. (Pax, 1921).

Thus at the end of the 19th century Carpathian Mts. remained the only refuge for bears in Poland. By that time they still inhabited a significant range within this region. In the Żywiecki Beskid Mts. bears were hunted throughout that time and were regarded as pests killing of which was financially awarded (Augustynowicz, 1939; De Levaux, 1851; Kawecki, 1939). The numbers of bear decreased *eg.* in the forests of Żywiec estate despite efforts and rewards only two bears were killed in 1877—1928 period (Lasy dóbr żywieckich, 1929). Nowicki (1870) reports on bears in Babia Góra Mt. region. The above information indicate that at the end of 19th century in the West Beskids and Babia Góra mountain ranges bears were encountered only as single, migrating individuals. In Tatra Mts., on the Polish side of the border, 1—2 bears were killed almost every year (Barabasz, 1929; Marchlewski 1962), and a 1879 census gave a total population figure of 15 bears for the whole of Tatra (Wrześniowski, 1882). Bear hunting in Bieszczady Mts. was reported by Leszczyński (1879), Schramm (1958) and Wohner (1880).

By the end of the 19th century brown bears were exterminated all over lowland Poland and in Sudety Mts., they survived only in Carpathians.

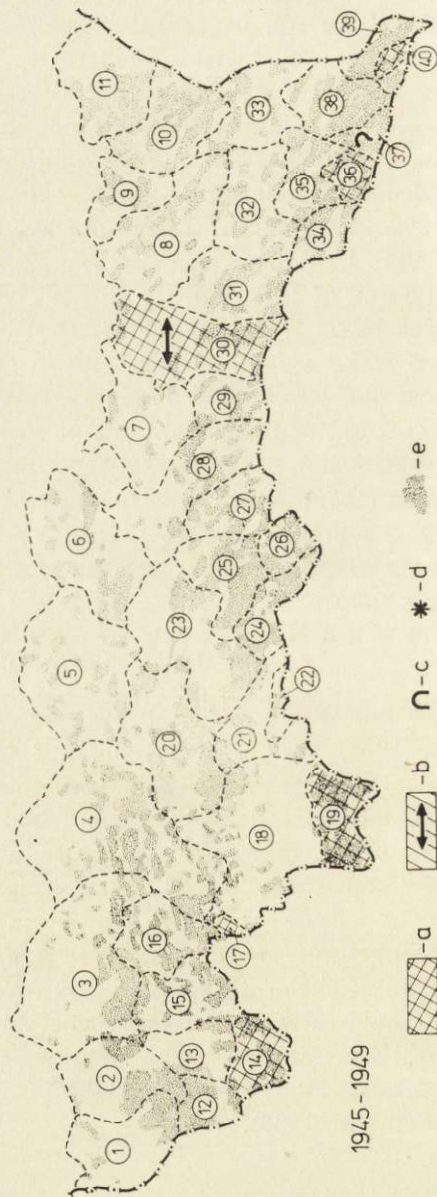
2.2. The Brown Bear in Poland between 1900 and 1945

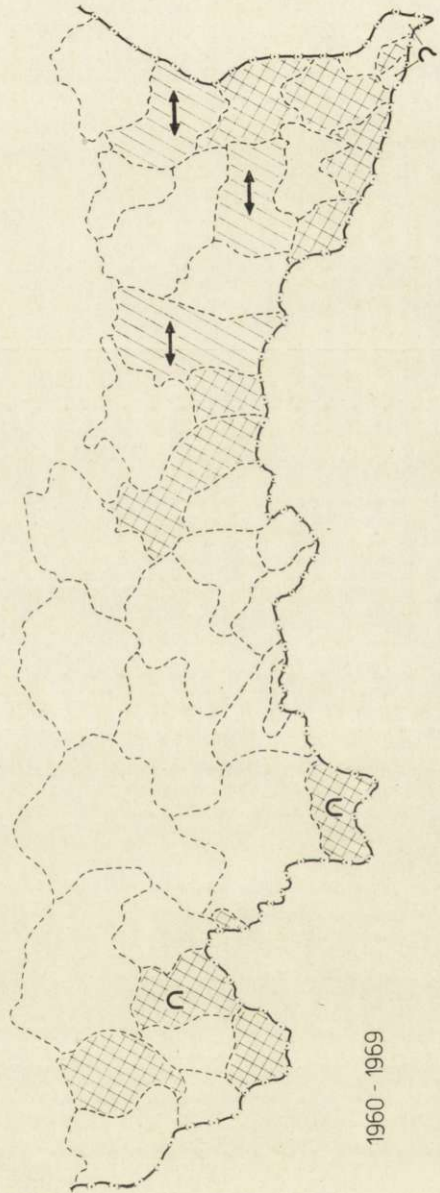
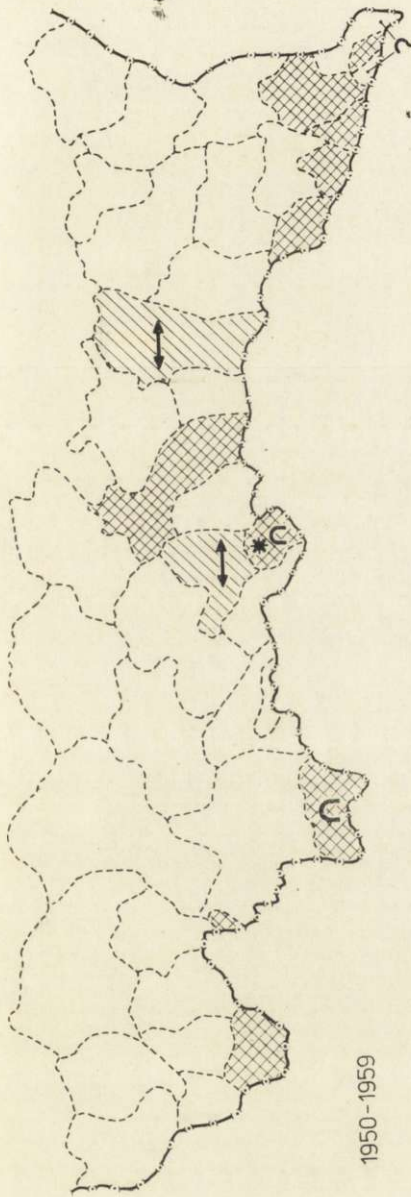
Till the World War I brown bears were hunted in Tatra Mts. (Barabasz, 1929) and other regions of Carpathian Mts. In the museum at Żywiec there is an individual killed in 1908 at Okrajnik. The last migrating individuals at Śląski Beskid Mts. were observed around 1918 (F. Kotajny, pers. comm.). Babia Góra, Jałowiec, and Mađralowa mountain ranges remained the only places visited by bears; during the thirties at least two cases of bears sighted in the area were recorded (Kawecki, 1939; Parusel, 1983). Also in Tatra Mts., after the World War I, the number of encounters with bears dropped (Podobiński, 1961a, b) although bears have always been present there (Anonymus 1977; Domaniewski, 1930, 1931; Marchlewski, 1962; Nyka 1956). Detailed information from Bieszczady Mts. is not available but bears have also been found there (Lindemann, 1956).

In 1937 an effort was made at restitution of the brown bear at Białowieża (Karpiński, 1947). It succeeded and in the time of World War II there were 3 bears living in the wild while in 1947 — 4 individuals were present in the area (Karpiński, 1947).

The 1900—1945 period signified further decline in numbers of bears and progressive shrinking of its range.

Fig. 1. The brown bears *Ursus arctos* found in Polish Carpathian Mts. in period: 1945—1982. Data determined on the basis of returned questionnaires, literature and additional inquiries. Administrative borders of the National Forest Administration drawn according to their arrangement on 31 Dec, 1981 are given in the first map, with the following numbers denoting forest districts or national parks: 1 — Ustroń, 2 — Bielsko, 3 — Andrychów, 4 — Myślenice, 5 — Brzesko, 6 — Gromnik, 7 — Kołaczyce, 8 — Brzozów, 9 — Dynów, 10 — Bircza, 11 — Krasieczyn, 12 — Wisła, 13 — Węgierska Górka, 14 — Ujsoły, 15 — Jeleśnia, 16 — Sucha, 17 — Babia Góra National Park, 18 — Nowy Targ, 19 — Tatra National Park, 20 — Limanowa, 21 — Krościenko, 22 — Pieniny National Park, 23 — Stary Sącz, 24 — Piwniczna, 25 — Nawojowa, 26 — Forest Experimental Station at Krynica belonging to Agricultural University, Cracow, 27 — Łosie, 28 — Gorlice, 29 — Zmigród, 30 — Dukla, 31 — Rymanów, 32 — Lesko, 33 — Brzezi Dolne, 34 — Komańcza, 35 — Baligród, 36 — Cisna, 37 — Wetlina, 38 — Lutowiska, 39 — Stuposiany, 40 — Bieszczady National Park. Symbols used: a — information on resident bears, b — information on transient bears, c — dens found, d — confirmed presence of female with cubs, e — forests, ? — no response to questionnaire.





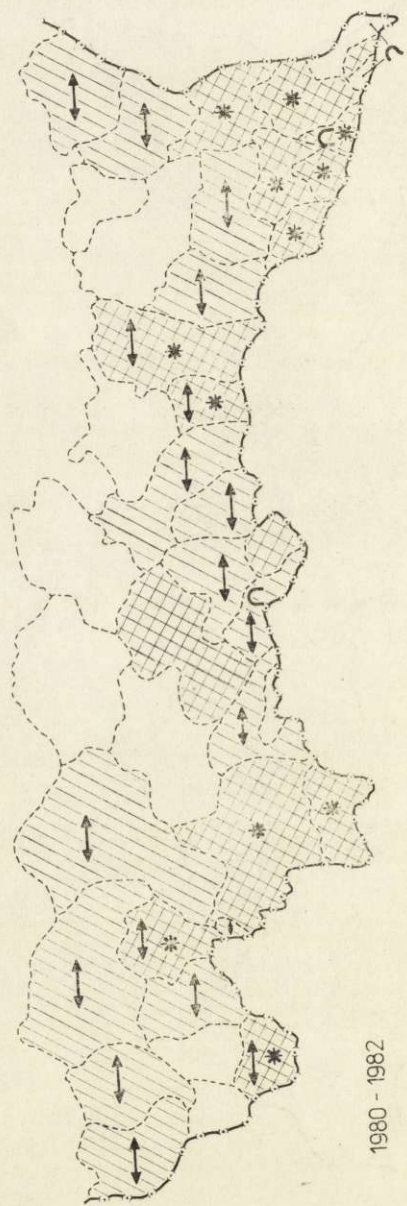
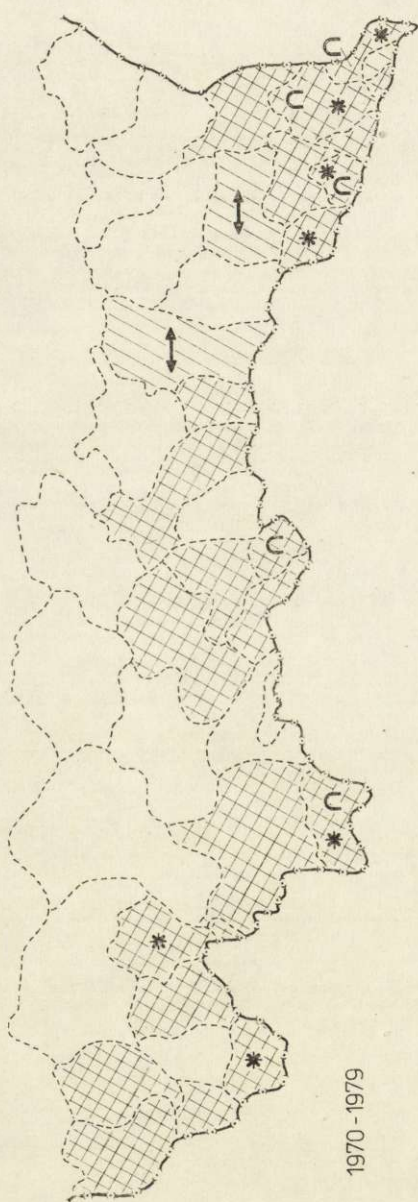


Fig. 1. Concluded.

2.3. The Brown Bear in Poland in 1946—1982

In 1946, five bears were known to live in Białowieża Forest but owing to poaching (confirmed shooting of two individuals) this number dropped still further and in 1947 tracks were seen only once (Karpiński, 1947). Unconfirmed reports of bears hibernating in Lacka Forest (northwestern part of Białowieża Forest) in 1959/60 winter were obtained by K. Makush-Woronicz (pers. comm.). The presence of the last migrating individual was positively confirmed there in May 1963. The bear returned to the eastern part of forest after staying a mere couple of days (Buchalczyk, 1980).

The changes of distribution in Carpathian Mts. in 1946—1982 (Fig. 1) indicate that brown bears had been considerably expanding their range and in the beginning of the eighties were found in four permanent refuges: Żywiecki and Wysoki Beskid, Tatra Mts., Sądecki Beskid, and Bieszczady Mts.

Table 1

Total numbers of the brown bear *Ursus arctos* in Poland.

Year	Number	Reference
1946	10—14	Buchalczyk (1980)
1959	10—12	Fengewisch (1965)
1965	20—25	Questionnaire 1965, corrected data
1965	35	Fengewisch (1965)
1970	36	GUS (1975)
1974	28	GUS (1975)
1975	35	Sumiński (1976)
1976	30—40	Questionnaire 1975, corrected data
1982	70—75	Questionnaire 1982, corrected data

The Carpathian population was, for a long time, divided into two parts: — western, comprising Tatra Mts. and the mountain ranges west of it, and eastern — limited to western Bieszczady Mts. (Buchalczyk, 1980). Although some individuals migrating between these two parts had been reported earlier (Krygowski, 1963; Witowski, 1954), but actual merging took place after 1980.

The territorial expansion of brown bears in Carpathian Mts. was by no means a steady process. Till the late sixties, the expansion was slow and restricted mainly to Bieszczady and Śląski Beskid Mts. After 1970 the expansion accelerated, chiefly in the western part of range: Śląski, Żywiecki and Wysoki Beskid Mts., as supported by data obtained by Parusel (1983) in Babia Góra massif.

Recently the range of brown bears in Poland covers southern part of

Table 2

The results of questionnaire-based studies carried in 1965, 1976, 1982 on numbers of brown bears *Ursus arctos* L. in Polish Carpathian Mts.

Forest Administ. District ¹ or National Park	1965 No. of animals	1976				1982			
		Adults	Cubs	Repr. ²	Dens	Adults	Cubs	Repr. ²	Dens
1	2	3	4	5	6	7	8	9	10
Beskid Śląski Mts.									
Ustroń (Brenna, Hażlach)	—	—	—	—	—	1 M	1	—	—
Bielsko-Biała (Szczyrk, Wapiennica)	1 M	1 M	0	—	+	1 M	0	—	—
Wisła (Istebna)	—	1 M	0	—	—	—	—	—	—
Beskid Żywiecki and Wysoki Mts.									
Ujsoly (Rycerka)	+M	2 R	0	—	—	3 R	1	+	—
Węgierska Górka (Lipowa)	—	—	—	—	—	—	—	—	—
Jeleśnia (Żywiec)	+M	1 R	0	—	—	4 M	0	—	—
Sucha	—	—	—	—	—	1 R	2	+	+
Andrychów	—	—	—	—	—	1 M	0	—	—
Babia Góra Ntl. Park	+M	1—2R	0	—	?	1 M	0	—	—
Tatra Mts.									
Tatry Ntl. Park	6—8R	7 R	1	+	+	6 R	?	+	+
Beskid Sądecki and Pieniny Mts.									
Nowy Targ	?	—	—	—	—	2 R	1	+	—
Krościenko	?	—	—	—	—	—	—	—	—
Pieniny Ntl. Park	—	—	—	—	—	—	—	—	—
Limanowa (Kamienica, Poręba Wlk.)	—	—	—	—	—	—	—	—	—
Stary Sącz	?	—	—	—	—	2 R	0	—	+
Piwniczna (Rytko, Muszyna)	+M	2 R	2	+	+	2 M	0	—	+
Nawojowa	—	+M	—	—	—	2 R	0	—	—
Krynica Exp. Stn.	1 M	—	—	—	—	2 R	0	—	—
Beskid Niski Mts.									
Łosie (Śnietnica, Gładyszów)	?	1 M	0	—	—	1 M	0	—	—
Gorlice (Gładyszów)	?	1 M	0	—	—	1 M	0	—	—
Zmigród (Krempna)	—	1 M	0	—	—	1 M	0	+	—
Kołaczyce	—	—	—	—	—	—	—	—	—
Dukla (Krosno, Jaśliska)	+M	2 M	0	—	—	0 M	0	+	—
Rymanów	—	?	?	?	?	1 R	0	—	+
West Bieszczady Mts.									
Lesko (Zagórz)	?	1 M	0	—	—	1 M	0	—	+
Bircza	?	—	—	—	—	—	—	—	—
Brzezi Dolne	—	2 M	0	—	—	1 R	2	+	?
Komańcza (Łupków)	+M	3 R	0	—	—	7 R	2	+	—

1	2	3	4	5	6	7	8	9	10
Baligród (Bukowiec)	?	1 M	0	—	—	1 M	0	—	—
Cisna	+M	1—2R	0	+	+	3 R	0	+	+
Wetlina	3 R	2 R	0	—	—	1 R	2	+	+
Lutowiska (Dwernik)	2 R	6 R	2	—	+	7 R	5	+	+
Bieszczady Ntl. Park		2 M	0	—	—	4 R	0	—	+
Stuposiany (Tarnawa)	+R	6 R	—	—	+	?	?	?	?
Total	13—15	44—46	6	(3)	(6)	57	16	(12)	(10)

¹ According to Polish state forests dividing of 1982. Earlier smaller district names are given in brackets. ² Repr. — reproduction, + — occurred, — — not informed. Explanation of symbols: + — presence, — . no data, ? — no response to questionnaire, R — resident, M — migrating.

Table 3
The numbers of the brown bear *Ursus arctos* in West
Bieszczady Mts.

Year	Number	References
c. 1950	several (< 10)	Grodziński (1957)
1958	several (< 10)	Ogonowski (1958)
1962	12—14 (max. 17)	Bielewicz (1962)
c. 1963	25 ?	Kosiba (1964)
1968	c. 20	Głowaciński & Witkowski (1969)
1972	c. 25	Ogonowski (1972)
	25—31	Buchalczyk & Markowski (1979)
1973	30	Ogonowski (1973)
	25	Sumiński (1976)
1976	26	Garstka (1977)
1976	18—27	Buchalczyk (1980)
1982	44	Questionnaire, 1982

western Beskidy Mts. and western part of Nowy Targ Valley, Tatra Mts., southern ranges of Eastern Beskidy Mts., and the whole area of Bieszczady Mts. (Buchalczyk, 1983).

2.4. The Numbers of the Brown Bear in Poland in 1946—1982

The data on estimated total numbers of bears in Poland since 1946 are presented in Table 1. The figures for 1970 and 1974 are undoubtedly overestimated as the official statistical data do not allow corrections for migration. The overall estimates for the 1946—1982 stands at 25—30 animals.

The results of questionnaire-based surveys carried out in 1965, 1976 and 1982 are given in Table 2. In 1965 13—15 bears were reported.

Taking into account large number of questionnaires returned without numbers of bears specified and a number of bears that might be migrating, the total count could be estimated at 20—25 individuals. In 1976 the survey gave estimate of 44—46 adults and 6 one-year old cubs. Again these data are too high because of interpolation has been made for three

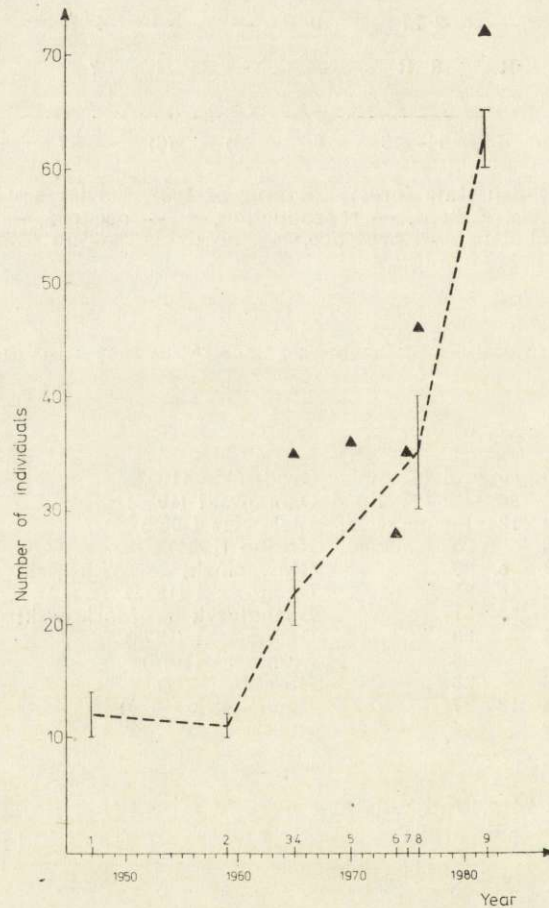


Fig. 2. Changes in numbers of brown bears (*Ursus arctos*) in Poland in 1946—1982 period. Labels 1 to 9 correspond with items in Table 1. Triangles denote maximum values, Vertical lines represent observed ranges.

years and no correction for migrating individuals introduced. The overall number of bears in Poland could be than estimated at 30—40 individuals. The 1982 survey and additional inquiries revealed 57 adults and 16 cubs *i.e.* total of 73 bears. Taking into account lacking returns from Stuposiany forest district (at least 10 bears) and certain overestimate owing to migration, the total count can be assessed as 70—75 animals. The changes

in numbers in 1946—82 (Fig. 2) indicate that there was four to fivefold increase of the bear population within this period.

In the two main refuges in Poland: Bieszczady and Tatra Mts., the dynamics of bear populations are similar (Table 3). In Bieszczady, during the first twenty years the numbers increased slowly to gain a significant momentum after 1970. In the Polish part of Tatra, according to the data gathered by Chałupczyńska (in prep.) again the number of bears prior to 1960 rose to their usual number of 7—10 individuals and maintained it, with certain oscillation, throughout the following period. The alterations in numbers depend on migrations to the southern and northern slopes and on limited capacity of Tatra habitats. Such carrying capacity was estimated as early as in the last century (Marchlewski, 1962). Simultaneously, in the Babia Góra massif the number of bears increased as shown by Parusel (1983).

2.5. Reproduction

Table 4 shows that in 1953—1982 in Poland (except Tatra Mts.) 27 bears were observed with 41 cubs. The number of females with cubs varied *e.g.* in 1980—7+10 cubs; in 1981—3+4; in 1982—11+16, *i.e.* annual average of 10 cubs. The annual increase for year 1982 amounted to 21.9% but in comparison to both preceding years it was an exceptionally good year. If the annual increase is calculated on the basis of the average population numbers the value rises still further to 23.9%. Usually, the number of cubs per female was one or two (in 14 and 12 cases respectively) only twice the females were reported to move about with three cubs one by Podobiński (1959) from Tatra, the other from Lutowska forest district in 1982 (J. Moszyńska, in litt.). The complete set of data for 1953—1982 period gives an average of 1.5 cubs per female, while for 1980—1982 period — 1.4 cubs.

Chałupczyńska (in press) has summarized all the data on the brown bear reproduction in Polish Tatra Mts. and reported that in 1943—1980 period 24 females with 46 cubs were sighted there *i.e.* the number of cubs per female was 1.9. On the Slovak part of Tatra the average was 1.6 in 1943—1971 (Podobiński, 1974).

Normally, in Tatra, 1—2 females give birth to cubs while in the whole of Polish Carpathian Mts. (Tatra included) 12—14 cubs are born every year.

However, there is no information about cub mortality in the first year of life and later before reaching maturity. The only bit of information was provided by Parusel (1982) who reported a finding of a dead cub

in the Babia Góra region. There are some notes about young bears (2—3 year old) killed at various localities (Bunsch 1967; Jakubiec *et al.*, 1983; Leńkowa, 1966; Parusel, 1982; Sałyga-Dąbrowska, 1980).

Table 4
Cases of reproduction observed in brown bear *Ursus arctos*
in Poland (except in Tatra Mts.).

Year	Locality ¹	No of females+young	References
1953	Beskid Sądecki (Jaworzyna)	1+2	Czarnowski (1955)
1966	Muszyna	1+2	Questionnaire, 1976
1976	Stuposiany	1+1	"
1979	Babia Góra northern slopes	1+2	Tomek (1983)
	Sucha, range Jałowiec	1+2	Parusel (1983)
	Ujsoły, Zwardoń	1+2	"
1980	Ujsoły	1+1	Questionnaire, 1982
	Piwniczna	1+2	M. W. Witkowski
	Zmigród	1+2	Questionnaire, 1982
	Dukla	1+1	"
	Komańcza	1+1	"
	Cisna	1+1	"
	Brzegi Dolne	1+2	"
1981	Ujsoły — Glinka	1+2	Cz. Iwanek
	Sucha	1+1	Questionnaire, 1982
	Komańcza	1+1	"
1982	Ustroń	1+1	S. Janczar
	Ujsoły	1+1	Questionnaire, 1982
	Babia Góra National Park	1+2	"
	Nowy Targ	1+1	"
	Komańcza	2+2	"
	Brzegi Dolne	1+2	"
	Lutowiska	3+5	"
	Wetlina	1+2	"
Total		27+41	

¹Names are given of mountains, national parks and State Forest Administration Districts.

2.6. Information About Dens and Hibernating Bears

In all, the information has been collected about 19 dens (Fig. 1). Although reflecting rather accidental findings they indicate that den sites are restricted mainly to the permanent refuges (see also Kowalski, 1962; Tomek, 1983).

Czarnowski (1955) informed about the den found in Sądecki Beskid in 1953. The data on den found on slopes of Szyndzielnia Mt. during 1966/67 and 1967/68 were given by F. Kotajny (*in litt.*). Account of den on Wołoszyn slopes was given by Nyka (1955) and on Czuba Rostocka by Podobiński (1959). Kowalski (1962) mentioned dens in caves of Mała Łąka Valley. From Jeleśnia forest district, a detailed description was

obtained of half-completed den found by S. Majer. It was situated under a large rock with windfallen tree leaning on it. It was lined with moss and stone pine (*Pinus cembra*) branches (there was a stone pine plantation nearby). Inside about half bucket of mountain ash, briar rose fruits and sloe-plums was found. Each kind of fruit was stored on a separate heap. In Bieszczady Mts., a den was found during 1961/62 winter within a tree belt in the fields, close to a village and in a large distance from forest (Bielewicz, 1962).

Every year, some bears do not enter winter sleep (Ogonowski, 1972). Under the climatic conditions prevailing in Poland the individuals active in January and February should be regarded as those that did not sleep (or were awakened).

3. DISCUSSION

Man exterminated bears throughout the ages because of overlapping ecological niches (oat, wild fruits, honey, domestic and game animals). Killing the remaining individuals in Poland between 17th and 19th centuries was a part of all-European drive although it was somewhat delayed (Fengewisch, 1963; Volmar, 1940).

During 1946—1982 in Polish Carpathian Mts. territorial expansion and increase in numbers of bears occurred. Both these processes gained momentum after 1970 and were undoubtedly linked with expansion of range and considerable numerical increase of the brown bear population in Slovakia (Hell, 1981; Macko, 1972; Randik, 1971). Similar expansion has also been observed in Finland (Pulliainen, 1983). A rebound in bear numbers in local European populations may be explained by protective measures introduced there or by a rational management of bear populations.

The average number of cubs per female in Poland stands at 1.4 — a value which is rather low when compared with corresponding data obtained in North America (Martinka, 1974; Pearson, 1975), and in Northern Europe (Novikov *et al.*, 1969).

In the years 1980—1982 considered in this study there were considerable oscillations in numbers of females with cubs. These stem from multiannual reproduction cycle in bears (Mundy & Flook, 1973) and from small size of Polish population. Similar phenomena were found by Martinka (1974) in his studies on much larger population of the grizzly bear.

The calculated annual increment in Polish population reached 21.9% in an particularly good year 1982. The annual population increments given by other authors ranged, in North America, between 14 to 26% (Mundy & Flook, 1973) or attained 19%, as average for a five-year period

(Martinka, 1974). In Slovak Tatra Mts. the increment ranged from 5 to 15% (Randik, 1971). There are diverse opinions about the cub mortality in the first year of life. In contrast to Martinka (1974) and Pearson (1975), Mundy and Flook (1973), Novikov *et al.* (1969), and Randik (1971) point at significant mortality within the first year.

4. KEY ISSUES IN BEAR PROTECTION

The increase in population numbers and territorial expansion of brown bears has brought about more palpable increase in the level of damage caused by these animals (Dębski, 1971; Rozpara, 1984; Sola, 1973). The volume of the damage is not yet high but it increases every year. So far, killing the animals was the only preventive measure in case of damage caused by bears. At least six bears have been shot in Poland since the end of World War II (Jakubiec *et al.*, 1983; Leńkowa, 1966; Olszewski, 1971; Parusel, 1982; and others). There have also been several cases of pouching. Around 1974 a bear got shot in Sądecki Beskid Mts.; in 1980 two animals were killed in forest districts of Sucha and Stary Sącz.

The compensation issue was regulated as early as in 1970, by no means solving the problem of bear damage. It seems that the conditions of maintaining the bear population in Poland should be studied in deep and a general line of tackling the problems should be established. First suggestions are already there (Buchalczyk, 1980; Jakubiec *et al.*, 1983; Padoł, 1981; Parusel, 1982). It is the matter of utmost importance to carry out annual censuses (as accurate as possible) of bear population in Poland. A follow-up should include: identifying and securing bear refuges (*e.g.* by extending national parks), changes of tourist routes, setting up undisturbed and silence zones. Next important task is to educate the forest administration, local population and tourists in respect to right attitude to bear and its protection. It seems that there are prospects for introducing bears into new areas (*e.g.* Karkonosze Mts.), particularly because the density of human settlements in Carpathian Mts. makes supporting any greater number of bears impossible.

The suggested measures should be implemented in close cooperation with Slovak counterparts. It should be stressed that any delay in introducing active protection of bear may contribute to a rapid increase in damage caused by bears thus threatening a change in positive, public attitude towards the species observed till now.

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WYSTĘPOWANIE I LICZEBNOŚĆ NIEDŹWIEDZIA BRUNATNEGO W POLSCE

Streszczenie

Niedźwiedź brunatny *Ursus arctos* Linnaeus, 1758 został wytępiony do końca XIX w. na całym niżu Polski i w Sudetach. Jedynie w Karpatach przetrwała niewielka populacja, która także była tępiona. Po drugiej wojnie światowej populacja ta zaczęła się odradzać, wykazując ekspansję terytorialną (Ryc. 1). Aktualnie w

Karpatach polskich można wydzielić cztery stałe ostoje niedźwiedzia: Beskid Żywiecki i Wysoki, Tatry, Beskid Sądecki i Bieszczady Zachodnie, a na pozostałych terenach stosunkowo często spotyka się osobniki migrujące.

Liczebność niedźwiedzia od 1945 do 1982 roku wzrosła 4—5 krotnie (Tabela 1, Ryc. 2). W okresie powojennym szacowano ją na 10—14 osobników, obecnie na 60—65 sztuk. Zmiany liczebności niedźwiedzia w Tatrach i Bieszczadach (Tabela 3) miały przebieg podobny. W Tatrach po osiągnięciu liczebności 7—10 sztuk utrzymuje się ona na stałym poziomie. W Bieszczadach początkowy powolny wzrost liczebności, uległ wyraźnemu przyspieszeniu w latach siedemdziesiątych i trwa nadal. Wzrost liczebności niedźwiedzia w Polsce jest związany z podobnym wzrostem na Słowacji (Hell, 1981; Macko, 1972; Randik, 1971).

Rozród niedźwiedzia w Polsce jest ograniczony do jego stałych ostoi (Ryc. 1, Tabele 2 i 4), a średni roczny przychówek dla lat 1980—1982 oceniono na 12—14 osobników przy średniej 1,4 młodych od samicy. Przyrost roczny, w wyjątkowo pomyślnym 1982 roku, wynosił 21,9%. Gawrowanie niedźwiedzia jest również w zasadzie ograniczone do jego stałych ostoi (Ryc. 1), ale pewna liczba zwierząt nie zapada w sen zimowy. W naszych warunkach klimatycznych za osobniki nie zasypiające na zimę (ewentualnie zbudzone) należy uznać te, które chodzą w styczniu i lutym.

W związku z rosnącymi rozmiarami szkód wyłaniają się coraz wyraźniej problemy ochrony niedźwiedzia. Konieczne jest prowadzenie badań w celu określenia jego liczebności i ostoi, odpowiednie przeszkolenie administracji leśnej i ludności oraz wypracowanie generalnej polityki ochrony tego zwierzęcia.