

# DYNAMICS OF BROWN BEAR RANGE AND STATUS OF ISOLATED POPULATIONS IN EUROPEAN RUSSIA, WESTERN SIBERIA AND ADJACENT COUNTRIES

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**Abstract:** The brown bear (*Ursus arctos*) population in Russia is approximately 130,000 animals, the largest population of this species remaining in the world. While the eastern part of brown bear range probably has not changed significantly for ages, the western part, especially that in the European part of the country, has been dramatically reduced compared with previous centuries. Progressive deforestation led to the southern border of bear range retreating northward. The northern border of brown bear range in Russia is still limited exclusively by natural zonation. This study reviewed the changes in brown bear range that occurred during the last 30–40 years using literature sources and a mail survey of local game managers. Brown bear distribution in Western Siberia did not appear to change significantly since 1960, while in European Russia the species range progressively enlarged to the south. The largest extension of brown bear distribution was observed in neighboring Estonia, where bears are now more widespread than they were 130 years ago. However, some insular populations were eliminated, and 5 remain in danger.

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**Key words:** brown bear, dynamics, isolated population, range, Russia, *Ursus arctos*.

The brown bear population in Russia is the largest in the world, with >130,000 bears (Chestin et al. 1992). Vast areas to the east of Yenisey River are inhabited by brown bears, from the tundra in the north to the Russian border in the south. However, the southern edge of brown bear range in European Russia and Western Siberia has been changing dramatically for ages. Human activities isolated some portions of bear range and caused the southern border to contract northward. This process was undocumented until the middle of this century.

Geptner et al. (1967) was the first to review brown bears distribution in Russia, and reconstruct the historic range by searching ancient manuscripts for records of bears. The former range of brown bears included almost all of Russia (except Astrakhan and Rostov oblasts and Kalmykia) and Ukraine (except Crimea and the coast of Azov Sea), and all of the Belarus and Baltic republics (Fig. 1). Russia is divided into oblasts and republics. Republics have more political and economic independence than oblasts, and were usually established in areas where a certain nationality dominated.

There is paleontologic evidence of a connection between the northern part of bear range and Caucasian refuge along the valley of the Don River (Vereshchagin 1959). Progressive deforestation and agriculture dramatically reduced bear range in 2 directions. Bears were pushed to the north from the forested steppe through deforestation. This occurred in Kazakhstan, the southern oblasts of Russia, and nearly all the plains of the Ukraine and southern Belarus. During the same time period and due to similar habitat destruction, bears were eliminated from the area between the Black, Azov, and Caspian Seas except in the Caucasian Mountains, where they persisted in isolation until present. (Fig. 1).

This study reviewed the changes in brown bear range in European Russia and Western Siberia, the portion of Russian bear range that has changed most dramatically since 1950 by first determining current distribution, and then drawing comparisons with bear distribution in previous decades as reported in the literature. East of the Yenisey River bears still range through all the forests and part of the tundra, stretching south through the southern border of Russia into Mongolia and China. Landscape transformation was much less in these eastern areas and present-day bear range coincides with historic range.

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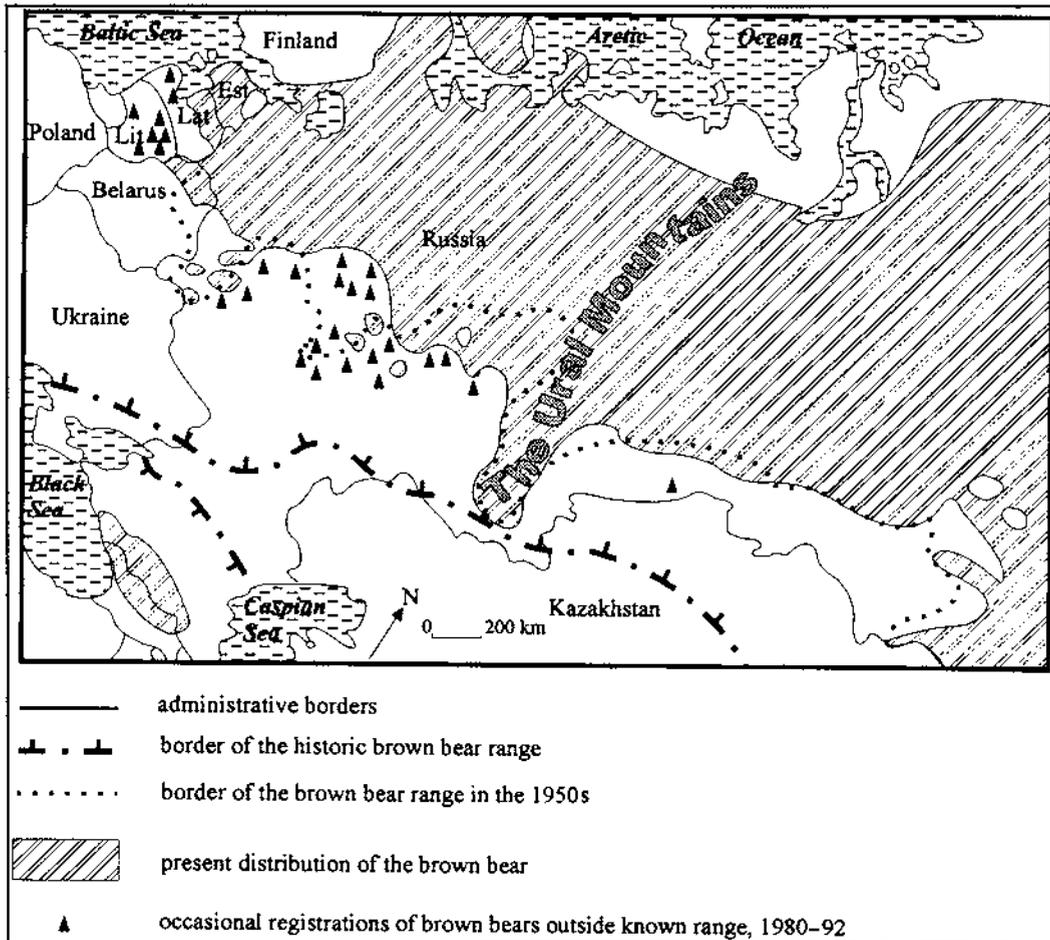


Fig. 1 Brown bear range in European Russia and Western Siberia, 1992.

## METHODS AND MATERIAL

I surveyed local game managers and staff of nature reserves to gather recent information on the distribution and status of bears in 49 administrative regions (Russian oblasts and republics and adjacent countries). I sent 47 questionnaires to local game departments and nature reserves in 43 Russian oblasts and republics, Azerbaijan, Belarus, Kazakhstan, Latvia, and Lithuania, and personally interviewed 5 managers and researchers from Russia and Estonia.

All questionnaires included a map where respondents were asked to delineate brown bear range in their area, and to mark places with occasional observations outside of known bear range. Questions were divided into 2 groups depending on the presence or absence of resident bears in a particular oblast, republic, or country. The following questions formed the first group, directed at regions with viable bear range:

1. How many bears live in the oblast, republic or country?
2. What was the trend in bear numbers during the last 10 years?
3. What were the changes in bear distribution in the oblast, republic or country during the last 10 years?
4. Are sows with cubs registered annually?
5. Is there exchange between the bear population in the oblast, republic or country and other parts of its range?
6. What factors are most threatening for bears in the oblast, republic or country?
7. Is there a possibility of increase in bear numbers in the oblast, republic or country?

The second group of questions, directed at regions where bears had been extirpated, were similar but focused more on the past:

1. When were bears or their tracks registered in oblast, republic or country for the last time?
2. When and where were the last sows with cubs registered in the oblast, republic or country?
3. What was the main cause of bear elimination in the oblast, republic or country?
4. Is there any possibility of brown bear restoration in the oblast, republic or country?

There were 3 surveys (1960, 1970, 1980) done by Okskiy Reserve, which monitored changes in bear range and number in Central European Russia (Priklonskiy 1967, Polyakova 1975, Kashentzeva 1990). These publications formed the basis for comparison with the current survey. There have been no publications devoted to changes of brown bear range to the east of Ural Mountains since the 1950s (Geptner et al. 1967).

## RESULTS AND DISCUSSION

I received 40 responses to the survey, including those from personal interviews, providing information from Belarus, Latvia, Lithuania, Estonia, and 35 Russian oblasts and republics. No questionnaires were returned from Caucasus (6 addresses in Russia and 1 in Azerbaijan).

Of 35 Russian oblasts and republics surveyed, 23 appeared to have resident bears (Fig. 2). Five more oblasts (Kurgan, Orel, Penza, Tula, Ulyanovsk, and Tatarstan) experienced occasional visits during the last 10 years. In 5 oblasts (Kursk, Lipetzk, Samara, Saratov, and Tambov) bears can be assumed to be extirpated, since the last record in Tambov oblast occurred in 1976, in Lipetzk oblast bears became extinct in the 1960s, and in Kursk oblast there were probably no bears since the beginning of the century. Game managers from Samara and Saratov oblasts could not remember when bears were last recorded.

There is no evidence of any changes in the historic northern border of brown bear distribution in Russia. Brown bears were never found in the tundra except in the Chukotka peninsula east of the region covered by this study. Their distribution there corresponds with that of the tundra ground-squirrel (*Citellus parryi*) which probably provides a food supply for bears in tundra communities.

Different trends have occurred along the southern borders of brown bear distribution in European Russia. Bear range has diminished in the central portion since the 1950s, but it has grown significantly to the south in the area between the Volga River and Ural Mountains (Fig. 1). However, the data of Geptner et al. (1967) for the

1950s could have been wrong, because a careful survey, by Priklonskiy (1969) in 1960, showed a slightly different bear distribution in European Russia (Fig. 3).

No significant changes were found in bear range to the east of Ural compared with the 1950s, except some shrinking in Altai (center Barnaul), Kemerovo, and Novosibirsk oblasts. According to our survey, bear range in Altai, Omsk, and Novosibirsk oblasts slightly expanded from 1980–92. In the opinion of Tyumen game managers, bear range and numbers decreased in the oblast since 1980 because of extensive oil and gas mining. At the same time, bears were occasionally registered even in the Kurgan oblast, which borders with semi-desert Kazakhstan (Fig. 1).

The present southern border of bear distribution in the Ural region coincides with the southern-most slopes of the mountains where they open into dry steppe. This is the only part of the southern edge of brown bear distribution in European Russia and Western Siberia where historic and recent bear ranges are the same.

Although I received no survey information from the Caucasus, my own field study of bears in Krasnodar oblast (northwestern Caucasus) showed no changes in bear distribution during the time period from 1983 to 1992. Personal communication with field researchers, game managers, and hunters described the bear range in the region as restricted to the slopes of the Caucasian Ridge (Fig. 1). However, this range should be viewed as the minimum, because bears also reside in several valleys in Georgia and Northern Caucasus (Kudaktin and Chestin 1993).

It is worth comparing the changes in bear range in central European Russia since 1960 with the recent survey. Figure 3 compiles the data, obtained in 1960 (Priklonskiy 1967), 1970 (Polyakova 1975), and 1980 (Kashentzeva 1990), which came from mail interviews of forest departments, and our survey. Apparently, the main trend of bear range in this area was continued expansion southward from 1960 through 1992.

The first survey (Priklonskiy 1967) conducted in 1960, demonstrated that since the 1910s–20s bear range has moved north by 40–150 km in the western part of the area and 10–25 km in the eastern part. The second survey (Polyakova 1975) showed some expansion of bear populations in the western part of the area, but bears were eliminated from the refuge on the border of Ryazan and Moscow oblasts, Tatarstan and Ulyanovsk, and Samara, Lipetzk, Orel, and Tula oblasts. However, the Bryansk population, which was supposed to have no connection with the main part of the range in 1960, appeared to be linked with the latter, forming a bridge to the south. The



**Fig. 2 Results of the 1992 survey of brown bear range in European Russia and western Siberia.**

The 1980 survey, (Kashentzeva 1990) again revealed 1 bear in Tatarstan, but no bears were reported from Tambov and Penza oblasts. Kashentzeva (1990) pointed out that by 1980 bear numbers in isolated populations experienced further decrease. Almost no bears were reported from Mordovia and Chuvashiya, and Kashentzeva (1990) predicted their extinction, as has already happened on the border of Moscow and Ryazan oblasts 10 years before.

Our data, collected during the survey in 1992 and from occasional field studies in 1989–92 differed from that of Kashentzeva (1990) and Polyakova (1975). For example, both authors referred to Bryansk oblast as part of entire bear range. However, I. Shpilenok, director of the State Nature Reserve Bryansk Forest, and an experienced investigator of regional fauna, reported to us that there were 2 isolated bear refuges in the oblast, and that only the northern one probably had irregular linkage with bear

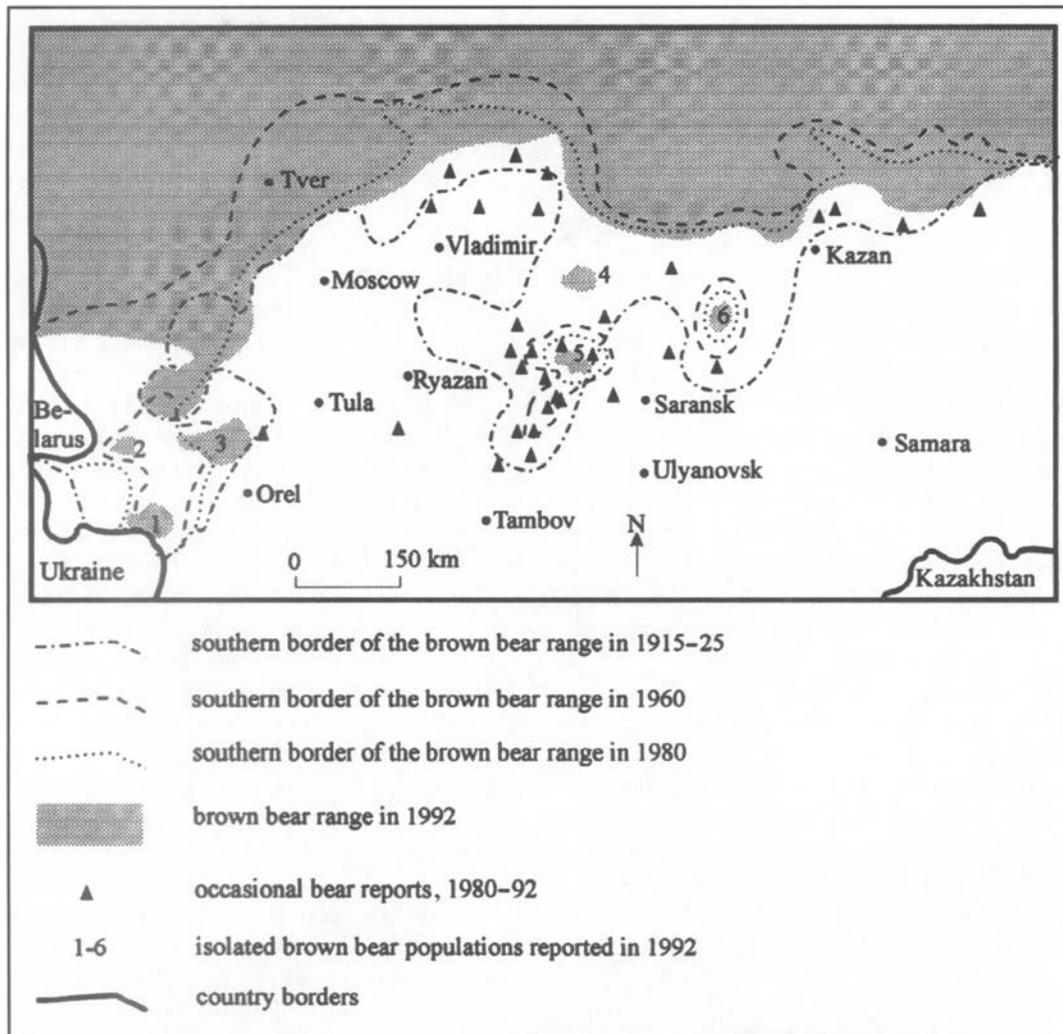


Fig. 3. Distribution of the brown bear in Central European Russia, 1915-92.

populations further north (Fig. 3). My field data, obtained in 1988-90 supported the isolation of the southern Bryansk bear population. Moreover, the southern population could have been isolated for a fairly long time because the only remaining forests in the oblast are inhabited by bears, and other forests in the oblast were cut down after The Second World War (1940s-50s). Hence there are vast clear areas between bear refuges in the southern portions of the oblast and bear populations in Kaluga and Smolensk oblasts. The northwestern bear population in Bryansk oblast may have had irregular exchange with the bear population in Kaluga oblast, but this statement needs careful field verification.

Only 4 bears were reported in the Kaluga oblast in 1980 (Kashentzeva 1990) and 1990 (Chestin et al. 1992), but in January of 1992 the local game department listed 80-90 bears resid-

ing in the oblast. The large discrepancy between these reports can be ascribed to the absence of regular counting. With a very small bear population in the 1960s and probably the 1970s, game managers kept reporting old estimates until they received new data after the 1992 count. The bear population in Kaluga oblast is divided into 2 subpopulations with 1 isolated from the rest of the bear range (Fig. 3, no. 3). There is probably a connection between these 2 populations along the border of the oblast. The bear population on the border of Kaluga, Orel, and Tula oblasts occasionally penetrates into the latter, which was confirmed by reports of bears in Tula oblast in 1985 and in Orel oblast in 1990 (Fig. 3), where this species was reported extirpated since 1970 (Polyakova 1975).

The steady southward movement of the bear range since 1960 is well illustrated by its dynamics in Smolensk, Tver,

Yaroslavl, Kostroma, Kirov, Ivanovo, and Moscow oblasts and Udmurtiya (Fig. 3). Numerous reports of bears outside the marked range in Ivanovo oblast and neighboring Nizhniy Novgorod oblast support this expansion (Fig. 3).

There are 4–6 isolated brown bear populations in the central European part of Russia (Fig. 3). These are probably the only insular populations in the entire country.

One of these populations occurs in the southeast of Bryansk oblast on the border with Ukraine (Fig. 3, no. 1). The habitat of this population fortunately falls under special protection, since it is within the State Nature Reserve Bryansk Forest. However, this population receives no special monitoring. The director of the reserve, I. Shpilenok, and I estimated the number of bears at approximately 10 individuals. Despite this small number of animals, sows with cubs are reported by local people annually. The main threats to this population are poaching and habitat destruction (timber cutting). The approximate distance to the nearest edge of adjacent bear range is about 100 km, which may result in occasional exchanges between populations. In 1996, a program to introduce specially adapted orphan cubs collected 700 km north of the area began to increase the bear number in this isolated population.

There is no information about the bear population in the northwest of Bryansk oblast (Fig. 3, no. 2) except that bears or their sign are regularly reported. Again, the proximity of adjacent bear range (50 km in Kaluga oblast) makes regular exchange highly probable, as mentioned for the isolated bear group in the southwestern part of Kaluga oblast (Fig. 3, no. 3).

The population in Nizhniy Novgorod oblast is also isolated (Fig. 3, no. 4), based on data from the local game department. Chief oblast game manager G. Paramonov reported that regular but rare records of bears and sows with cubs occur in that area. However, several reports of bears outside the denoted area suggests that the entire southern part of the oblast may be inhabited by bears at a very low density. According to the local game department, bear numbers in the oblast have no potential for growth due to habitat destruction and poaching.

I also question the isolation of the bear population in Mordovia (Fig. 3, no. 5). The range of this population was thought to be restricted by the borders of Mordovia State Nature Reserve. Both Kashentzeva (1990) and Dr. Potapov (Mordovia Nature Reserve, our survey) reported that the Mordovia State Nature Reserve was the only place where bears persisted in the republic. However, the local game department reported numerous records of bears outside the reserve along the western and northern borders of Mordovia in 1982, 1983, 1985, and 1986. Dr. S.

Priklonskiy (Okский State Nature Reserve, Ryazan oblast, Russia) in our survey also marked the border of Ryazan oblast and Mordovia as the location of numerous regular bear reports. Therefore, it is more likely that the Reserve may act as a refuge for bears in the region and bear density there is higher than in the surrounding area, but bears are much more widespread beyond the boundaries of the Reserve. Reports of bears up to 150 km south of the Reserve, along the border between Mordovia, Ryazan, Tambov, and Penza oblasts, indicate that those habitats are also inhabited by bears and thus should probably be included in the entire bear range. Bears in Tambov and Penza oblasts were supposed to be extinct by 1980 (Kashentzeva 1990) but our survey revealed the last bear was reported in Tambov oblast in 1976 and in Penza oblast in 1988 (Fig. 3). The bear population in this area is very vulnerable regardless of whether it is split into several isolated populations. Habitat destruction (deforestation) is the main cause for the current state of this population.

The last isolated bear population reported in our survey is located in Chuvashiya (Fig. 3, no. 6), about 75–100 km from the main part of bear range in the north portion of the republic, on the border with the republic of Mariy El. Only 5–10 bears make up this population, according to the local game department. However, reports from neighboring Ulyanovsk oblast indicate 1 resident and 3 migrating bears living 50 km south of the isolated population in Chuvashiya, and occasional reports of bears in the northeast part of Mordovia may be evidence of a more viable and numerous population inhabiting all the southern portion of Chuvashiya. Neither Chuvashiya nor Ulyanovsk oblast, or Mordovia have any potential for bear restoration because they have no appropriate habitat. Ulyanovsk was mentioned as having no bears both by Polyakova (1975) and Kashentzeva (1990).

Kaal (1980) reviewed the historic range of brown bears in Estonia. In 1860, bears inhabited all the area along the border with Russia and Latvia, but by 1900 their range diminished and the only bears remaining were those in the very northeastern part of Estonia (Kaal 1980). However, this refuge persisted until the 1970s, with an apparent trend toward southwestern expansion. In 1980 the bear range reached the center of the country, and by 1992 bears reinhabited all of Estonia, including Saaremaa island in the Baltic Sea (Fig. 1, M. Kaal, Tallinn Zoo, Tallinn, Estonia, pers. commun., 1992). Today the brown bear range in Estonia is much larger than 130 years ago. Natural restoration of the bear population in Estonia took about 30 years. At the beginning of the 1960s, only 30 bears were registered in the republic, but more than 400 were found in 1992 (M. Kaal, Tallinn Zoo, Tallinn, Estonia,

pers. commun., 1992). This is the only case found by this survey where bears are now more widespread than they were in the previous century. Estonian bears are part of the population inhabiting all temperate forests and taiga from the Pacific Ocean in the east to the Baltic Sea in the west. This population has regular exchange with the bear population in the Sanct-Peterburg oblast.

Both Latvian and Lithuanian respondents mentioned the growth in bear numbers in their countries. Latvia now has 10–15 resident bears (versus 5 in 1989, Chestin et al. 1992), with more than half of the area inhabited by bears. In both Latvia and Lithuania bears were occasionally documented in 1980–92 (Fig. 1). Females with cubs were recorded, but not annually. In Lithuania, there were 3 bear encounters reported in 1960–70, 1 in 1970–80, 3 in 1980–90, and 4 were reported in 1991, one of which was the most western location reported in the last 30 years (Fig. 1). However, there seem to be no resident bears in Lithuania and no females with cubs were observed in 1960–92, but increasing numbers of bear reports suggests probable repopulation of the area. Both Latvian and Lithuanian bear populations faced habitat destruction as the main cause of their reduction, but respondents in both countries reported positively on the potential for growth in bear numbers and range expansion.

The former range of brown bears included all of Belarus (Fig. 1). Unfortunately, no records were kept on the reduction of this population. It is known that in 1950 bears lived only in the northern oblasts of the republic (Serzhanin 1955). In 1992 bears were mentioned as resident in all of the Vitebsk oblast and the northern part of the Minsk oblast (P. Kozlo, Belarus Academy of Sciences, Minsk, Belarus, 1992, our survey). This is part of the main range, bordering with the Russian Smolensk bear population. Brown bear numbers have increased in Belarus from 1960 to the present. Prikloński (1969) reported 50 bears in the republic for 1960, Vereshchagin (1972) mentioned 65 bears at the beginning of the 1960s, Lavrov (1975) estimated bear numbers in Belarus in 1970 as 80 individuals, and recently P. Kozlo (Belarus Academy of Sciences, Minsk, Belarus, pers. commun., 1992) estimated 100–110 bears.

Bear populations in Finland, Sweden, and Norway form the western edge of unbroken brown bear range in Eurasia. There are numerous records of extensive exchange between the Karelian bear population and Finland (Pulliainen 1983). However, other European bear populations are isolated from the main bear range in Eurasia. The Polish–Czech–Slovak–Ukrainian–Romanian population, which inhabits the Carpathian mountains, is probably the largest insulated bear refuge with about 7,500

individuals (Jakubiec and Buchalczyk 1987; Hell and Bevilaqua 1988, Verstrael 1988). Another presumably viable European refuge is that in Greece and former Yugoslavia with about 2,000 bears (Verstrael 1988). Other isolated European brown bear populations, like those in Bulgaria, Italy, France, and Spain are much smaller.

The expanding bear range in Estonia, Latvia, Lithuania, and western Russia could suggest that a habitat linkage between Fennoscandia and Russian bear ranges and the Carpathian range is feasible. However, the vast areas in Belarus and Ukraine which divide these 2 largest pieces of bear range, were unfortunately turned into agricultural lands. If left for several decades the forests could be restored, but the density of the human population makes this very unlikely. In Belarus, despite increases in bear numbers, bear range has not changed significantly during the last 30 years.

According to expert estimates of local game managers received in this survey, the present bear range in Russia cannot move further south. Only game officers from Penza oblast consider the restoration of a bear population in that oblast possible. Neither Tambov, Kursk, Tula, and Ulyanovsk oblasts or Tatarstan have any potential to rebuild viable bear populations. Bear numbers in Kaluga and Smolensk oblasts can increase a little further. Habitat destruction and high human population density were considered the main causes preventing restoration of brown bears to their historic range in these oblasts.

## LITERATURE CITED

- CHESTIN, I.E., Y.P. GUBAR, V.E. SOKOLOV, AND V.S. LOBACHEV. 1992. Brown bear in the USSR: number, hunting and systematics. *Annales Zoologici Fennici* 29:57–68.
- GEPTNER, V.G., N.P. NAUMOV, P.B. YURGENSON, A.A. SLUDSKIY, A.F. CHIRKOVA, AND A.G. BANNIKOV. 1967. Mammals of the Soviet Union. *Sirenia and Carnivora*. V. 2, Part 1. Vysshaya Shkola, Moscow, Russia. 1008pp. (In Russian.)
- HELL, P., AND F. BEVILAQUA. 1988. Das Zusammenleben des Menschen mit dem Braunbären (*Ursus arctos*) in den Westkarpaten. *L. Jagdwiss* 34(3):153–163. (In German.)
- JAKUBIEC, Z., AND T. BUCHALCZYK. 1987. The brown bear in Poland: its history and present numbers. *Acta Theriol.* 32:289–306.
- KAAL, M.I. 1980. Brown bear. Tallinn, Valgus, Estonia. 97pp. (In Estonian with English summary.)
- KASHENTZEVA, T.A. 1990. Distribution and number of brown bears and lynx in the center of European part of RSFSR. Pages 109–117 in S.G. Prikloński, ed. Multiannual dynamics of natural objects of Okskiy Reserve, Moskovskiy Rabochiy, Moscow, Russia. (In Russian.)
- KUDAKTIN, A.N., AND I.E. CHESTIN. 1993. The Caucasus. Pages 136–170 in M.A. Vaisfeld and I.E. Chestin, eds. *Bears*.

- Nauka, Moscow, Russia. (In Russian with English summary.)
- LAVROV, N.P. 1975. Dynamics of the range and number of brown bears in central and eastern oblasts of the European part of the USSR over the last 40 years. *Trudy Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Okhotnichyego Khozyaystva i Zverovodstva.* 25:58–111. (In Russian.)
- POLYAKOVA, A.D. 1975. Changes in the distribution and number of brown bear and lynx in Middle Russia. *Trudy Okskogo Gosudarstvennogo Zapovednika.* 11:289–320 (In Russian.)
- PRIKLONSKIY, S.G. 1969. Distribution and number of brown bear and lynx in Middle Russia. *Trudy Okskogo Gosudarstvennogo Zapovednika* 7:69–116. (In Russian.)
- PULLIAINEN, E. 1983. Behaviour of an expanding population of the brown bear (*Ursus arctos* L.) in Northern Europe. *Zeitschr. Säugetierk* 48:290–297.
- SERZHANIN, I.N. 1955. Mammals of Belorussia. Minsk, Belarus. 328pp. (In Russian.)
- VERESHCHAGIN, N.K. 1959. Mammals of the Caucasus. Moscow, Russia. (In Russian.)
- . 1972. How many brown bears are there in the USSR?. *Okhota i Okhotnichye.* *Khozyaystvo* 11:20–21. (In Russian.)
- VERSTRAEL, T.J. 1988. De Verspreiding van de bruine beer, *Ursus arctos*, in Europa. *Lutra* 31:44–61.