

Brown Bear Conservation Action Plan for Asia

IUCN Category: Lower Risk, least concern **CITES Listing:** Appendix II; Appendix I (China, Mongolia)
Scientific Names: *Ursus arctos*, *Ursus arctos lasiotus*, *Ursus arctos isabellinus*, *Ursus arctos yesoensis*
Common Names: brown bear, Himalayan brown bear, Hokkaido brown bear, Gobi bear

Figure 7.1. General brown bear (*Ursus arctos*) distribution in Asia.



Introduction

In Asia the brown bear (*Ursus arctos*) is widely distributed from the tundra and boreal forests of Russia in the north to the Himalayas in the south (Servheen 1990), see Figure 7.1.

Status and management of bears in Heilongjiang, China

Cheng Jizhen

Status and distribution

Heilongjiang province is one of the main strongholds of bears in China. In recent years, however, the number of

bears has dropped significantly in response to human-caused changes in the natural environment, and as a result of great hunting pressure. Understanding the status of bears in Heilongjiang will aid in the understanding of the conservation status of bears throughout China.

Both Asiatic black bears (*Ursus thibetanus ussuricus*) (Figure 10.2) and the brown bear (*U. arctos lasiotus*) (Figure 7.2) are found in Heilongjiang. Brown bears are distributed throughout the forested areas. Until the 1950s, the black bear was also distributed throughout the forested areas, but by the end of the 1970s it was found only in the mountains east of the 127°E longitude.

Because bears cause damage to agricultural crops, they were considered a destructive pest species up until the 1970s. Populations seem to have declined over the last 20 years. This is reflected in the decline in the sale of bear



Figure 7.2. Estimated 1990 distribution of brown bear (*Ursus arctos*) in China.



Brown bear (*Ursus arctos*) in Lhasa Zoo, Tibet.

G. Schaller

Table 7.1. Bear (*Ursus arctos* and *U. thibetanus*) numbers in regions of Heilongjiang Province, China

| Regions | Total (black & brown) | Density (no./100km ²) | Brown bear numbers |
|----------------|--------------------------|--------------------------------------|-----------------------|
| Yichun | 1024 | 2.62 | 436 |
| Songhuajiang | 866 | 3.35 | 381 |
| Mudanjiang | 759 | 2.54 | 329 |
| Hejiang | 354 | 4.13 | 154 |
| Daxing'an Mtn. | ? | ? | ? |

(investigation reliability 80%)

skins in Heilongjiang between 1971 and 1982. Currently there are an estimated 3,000–4,000 bears in Heilongjiang Province. Brown bears account for about 500–1,500 of this total. Both species are classified as “Vulnerable Species” in Heilongjiang. Data on bear numbers in the various districts can be found in Table 7.1.

Population and habitat threats

The growth of bear populations is limited by several factors. The most important of which include human-caused habitat disturbances, the growth of human population, cutting of forests, and related deterioration of habitat. These factors contribute to a loss of feeding sites and cover areas for the bears. Consequently, distribution ranges for the bears have become isolated and comparable to islands. In the Xiaoxing'an Mountain district, where bears are abundant, the human population has increased by 16 times in the last 30 years, forest area has decreased between 40 and 60% since the 1950s, and the area of cultivated lands has increased by 1.5 times in the last 10 years.

In addition, because of the high economic value that bear parts command, illegal hunting and capture has become a very serious contributing factor to the decline in bear numbers. In 1983, Heilongjiang exported 300kg of bear paws to Japan (equivalent to approximately 40 bears). In Dalian City in 1990, 2,700kg of bear paws were ready for export, including many from Heilongjiang Province. In recent years, China has energetically developed bear ranching operations, now containing between 6,000 and 8,000 bears. Because more than 1,000 bears for these ranches were captured in Heilongjiang Province, the control of illegal hunting and capture has become a top priority.

Management

In 1988, China issued a Protective Law of Wildlife which now lists bears as Class 2 protected species.

The main protection measures are: 1) Publicizing the law, developing wildlife education programs, and

encouraging awareness of conservation among the citizenry; 2) Establishment of natural reserves for bears at higher densities (17 reserves have been established for the bears in Heilongjiang); 3) Control forest cutting in bear range; 4) Prohibit illegal hunting and capture of bears; 5) Carry out biological research on bears.

In recent years there has been great interest in the captive raising of bears in order to extract bile from their gall bladders. One living bear can provide as much bile as 35–40 hunted bears. Now, there are 17 bear farms in Heilongjiang province, with more than 300 bears being raised. Most of these bears were removed from the wild, and the impact on the population of wild bears was substantial. There continues a difficult relationship between bear protection and utilization. Currently, bear farms conduct studies on artificial breeding of wild bears to become captive breeders (thereby eliminating the need for further captures in the wild). In Heilongjiang, a natural F2 generation has been produced by natural reproduction in a captive population.

Specific conservation recommendations

The population of wild bears and their habitat in Heilongjiang Province has decreased. Protection of the remaining habitat and effective control of illegal hunting and capture activities are serious problems to be overcome. In addition, further efforts in artificial breeding among captive bears might ease demand for bears from the wild. These activities should be brought under a broad program for bear conservation in the Heilongjiang Province.

Status and management of the Himalayan brown bear in India

S. Sathyakumar

Historic range and current distribution

The Himalayan brown bear (*Ursus arctos isabellinus*) occurs in very low densities in the alpine regions of the Greater and Trans Himalayan regions in India. It is rare and usually encountered between 3,000 to 5,000m in elevation. Populations of brown bear are largely confined to the western and northwestern Himalayan ranges in India (Figure 7.3) and occur in the states of Jammu and Kashmir, Himachal Pradesh, and Uttar Pradesh. A small population exists in the central Himalayan regions of India i.e., Sikkim, which may be the subspecies *U. a. pruinosus*. This subspecies is also reported to be present in the alpine regions of the eastern Himalayan region (Arunachal Pradesh) but this needs to be confirmed. Very little information exists on the past and present status of Himalayan brown bear in India.

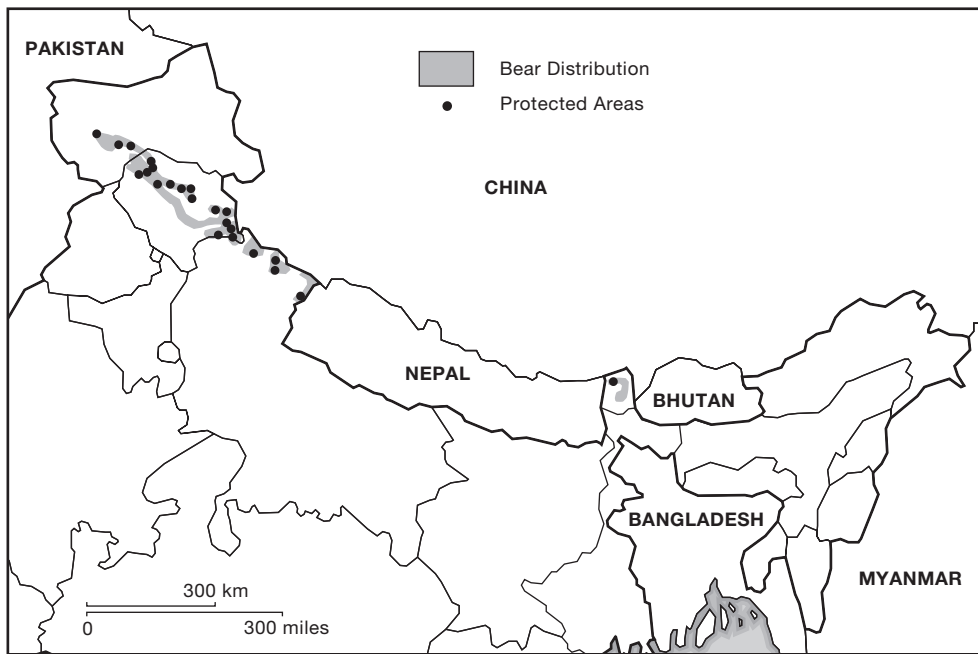


Figure 7.3. Estimated present distribution of the Himalayan brown bear (*Ursus arctos*) in India, and protected areas.

Table 7.2. Protected Areas in India with Himalayan brown bear (*Ursus arctos*) populations, and their status.

| Name of the State and Protected Area | Area (km ²) | Past status | Present status |
|---|-------------------------|-------------|----------------|
| Jammu and Kashmir | | | |
| Dachigam NP | 141 | RR (1989) | UK (1995) |
| Kistwar NP | 400 | UK | UK (1995) |
| Limber-Lachipora WS | 106 | UK | UK (1995) |
| Overa WS & Overa-Aru WS | 457 | RR (1991) | UK (1995) |
| Himachal Pradesh | | | |
| Daranghati WS | 42 | UK | FC (1994) |
| Gangul Siahbehi WS | 109 | UK | UK (1995) |
| Great Himalayan NP | 620 | FC (?) | FC (1994) |
| Kais WS | 14 | FC (?) | FC (1994) |
| Kalatop-Khajjjar WS | 69 | UK | UK (1994) |
| Kanawar WS | 54 | RR (?) | RR (1994) |
| Kugti WS | 379 | FC (1992) | CM (1993) |
| Lippa Asrang WS | 31 | UK | UK (1995) |
| Sangla WS | 650 | RR (?) | RR (1994) |
| Rupi Bhaba WS | 125 | RR (?) | RR (1994) |
| Sechu Tuan Nala WS | 103 | UK | UK (1995) |
| Talra WS | 26 | UK | UK (1995) |
| Tundah WS | 64 | FC (1992) | FC (1993) |
| Uttar Pradesh | | | |
| Askot WS | 600 | UK | UK (1995) |
| Govind WS | 953 | RR (1988) | RR (1992) |
| Kedarnath WS | 975 | UK (1981) | RR (1991) |
| Nanda Devi BR | 2,237 | RR (1983) | UK (1993) |
| Valley of Flowers NP | 88 | UK | UK (1995) |
| Sikkim | | | |
| Khangchendzonga NP | 850 | UK | UK |
| WS – Wildlife Sanctuary; NP – National Park; TR – Tiger Reserve RR – Rare; CM – Common; FC – Fairly Common; VC – Very Common; UK – Unknown; | | | |

Schaller (1977) stated that the Himalayan brown bear is largely confined to the rolling uplands and alpine meadows above timberline, ecologically separated from the forest dwelling Asiatic black bear (*U. thibetanus*). Potential Himalayan brown bear habitat range in India is about 4,229km², of which very little is protected under the existing network of Protected Areas (PAs) (WIINWDB 1995).

The distribution and status of the Himalayan brown bear in Indian PAs is presented in Table 7.2. It also occurs in suitable undisturbed habitat in the major valleys in its range. The following gives sources for the data presented in Table 7.2.

Jammu and Kashmir

Dachigam National Park (NP); Overa Wildlife Sanctuary (WS) (T. Price pers. comm.); Overa-Aru WS, Limber-Lachipora WS and Kistwar NP (Green 1993). It is also reported to occur in suitable undisturbed alpine areas of this state such as Zanskar valley (S.P. Sinha pers. comm.) However, the present status of brown bears in this state is not known.

Himachal Pradesh

Present in 13 PAs (Singh *et al.* 1990; Green 1993; WIINWDB 1995) and in some valleys. Great Himalayan NP (S. Pandey pers. comm.); Kais WS (G.R. Thakur pers. comm.); Tundah WS, and Kugti WS (P. Singh pers. comm.). Kanawar WS (P.S. Chauhan pers. comm.); Sangla WS (A. Gautam pers. comm.); and Rup Bhaba WS (K.K. Gupta pers. comm.). Brown bears are also reported to occur in Malana Valley, Hamta Pass, Solang Valley (S.P. Sinha pers. comm.), Bara Bangal, Parbati Valley, Ropa

Valley, Kaksthal, Manali, Pooh, Lingti, and Ensa Valley (Lahul and Spiti). It is reported to be fairly common in Bara Bangal, Ropa (Kinnaur District), and Ensa (in Spiti) valleys (S. Pandey pers. comm.).

Uttar Pradesh

Himalayan brown bear occur in and around Nanda Devi NP and Biosphere Reserve (BR) (Lamba 1987), Kedarnath WS (Sathyakumar 1994; J. Ram pers. comm.), Valley of Flowers NP, Govind WS, Askot WS (WIINWDB 1995), and in alpine regions of Yamunotri, Gangotri, Badrinath, Mana, Almora, and Pithoragarh areas. The status of brown bears is not known in other areas.

Sikkim

U. a. pruinosus is reported to be present in the upper reaches of Kanchendzonga NP and in suitable undisturbed alpine areas. (G. Tewari pers. comm.). The past and the present status of the species in this state is not known.

Captive populations

Only a few zoological facilities such as Himalayan Nature Park, Kufri (Himachal Pradesh), Sri Chamrajendra Zoo, Mysore (Karnataka), and National Zoological Park, Delhi have brown bears. The number in captivity may not be more than 10 individuals.

Legal status

The Himalayan brown bear is listed as 'Vulnerable' in the Red Data Book (IUCN 1974). The subspecies is not listed in the 1996 Red List (IUCN 1996). It is in Appendix I of CITES in India (Anon. 1992a), and in Schedule I of the Indian Wildlife (Protection) Act (Anon 1972) and its 1991 amendment.

Population threats

The Himalayan brown bear is threatened in India due to poaching to reduce predation on livestock and for skins (ornamental). Migratory grazers (gaddis and bakkarwals) in Himachal Pradesh often eliminate brown bears while grazing their livestock (goat and sheep) in the alpine pastures to reduce predation. Poaching for skin or trophy is very rare.

Habitat threats

Himalayan brown bears are also threatened by large scale habitat destruction in the form of developmental activities (road construction). Very little potential Himalayan brown bear habitat in India is protected under the existing network

of PAs (Rodgers and Panwar 1988; WIINWDB 1995). In Jammu and Kashmir, the major threat to brown bear habitat in India is from the militants and their activities, and consequent lack of protection. In Himachal Pradesh and Uttar Pradesh, habitat destruction results from livestock grazing in alpine pastures. In Sikkim, activities of the Indian Army, mountaineering institutes, and trekking clubs have led to large scale destruction of brown bear habitat. Medicinal plant collection from the alpine pastures by the local villagers also has an impact on brown bear habitat.

Management

The Indian Wildlife (Protection) Act, 1972, and its amendment in 1991 help in protection of the Himalayan brown bear. India ratified CITES in 1976 and the brown bear is in Appendix I, which bans international trade in its products. TRAFFIC-India also keeps a check on trade of this species and its products. State Forest Depts. have started compensating for livestock killed by brown bear.

Conservation recommendations

1. The Himalayan brown bear should be listed as "Endangered" by the IUCN.
2. The proposal for declaring new PAs and proposed extensions of existing PAs in the trans Himalayan regions of India (Rodgers and Panwar 1988) has to be executed by concerned State Forest Departments as soon as possible.
3. Some large PAs such as Nanda Devi BR, Kedarnath WS, Govind WS, and Great Himalayan NP can be brought under the proposed Snow Leopard Recovery Program (Project Snow Leopard) to enable improvement in infrastructure and management.
4. Developmental activities such as road construction in Sikkim need to be controlled by the Central and State Governments to reduce impact on brown bear habitats.
5. Awareness programs for migratory grazers, Indian Army, border police personnel, and the general public are needed.
6. Status surveys for brown bears have to be conducted in its entire distribution range in India. Even basic information on presence/ absence of brown bears in different parts of India is not available.
7. Monitoring of brown bear status and numbers based on direct and indirect evidence in different PAs has to be initiated. Research on ecology of brown bears is necessary as information on food and feeding habits, habitat utilization, and ranging patterns are crucial for long-term conservation and management of this species.

Acknowledgements

Sincere thanks to all scientists, foresters, and researchers who have provided valuable information about the status of black and brown bears by returning answered questionnaires and through discussions. Thanks also to the Chief Wildlife Wardens and officials of the State Forest Depts. of Jammu and Kashmir, Himachal Pradesh, Uttar Pradesh, West Bengal, Sikkim, and Arunachal Pradesh. At the Wildlife Institute of India, Shri S.K. Mukherjee, Director, and Dr. A.J.T. Johnsingh, Head, Wildlife Biology Faculty, for their help and constant source of encouragement. Shri Sanjeeva Pandey, Dr. V.B. Mathur, senior faculty colleagues, who helped in the completion of this report. Smt. Vidya R. Athreya, Research Fellow and Shri. G.S. Shanmugam, cartographer, helped in the preparation of the figures. Shri. J.S. Kathayat helped in the retrieval of information from the National Wildlife Database. My special thanks are to my loving wife Archana for her help and support in the preparation of this report.

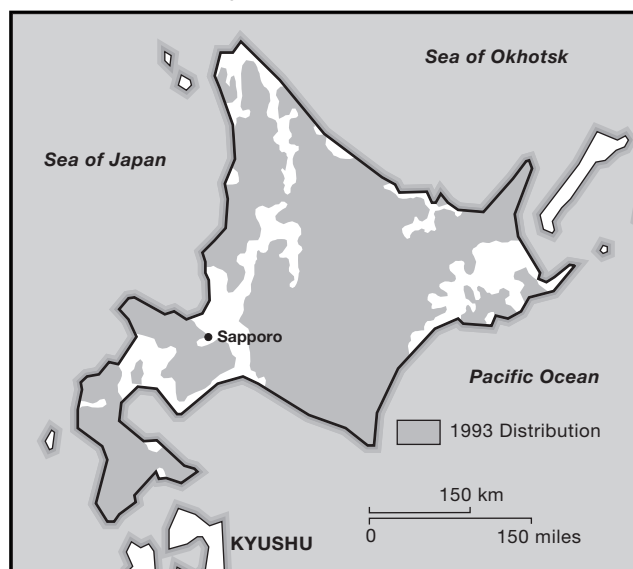
Status and management of the Hokkaido brown bear in Japan

Tsutomu Mano and Joseph Moll

Historic range and current distribution

The Hokkaido brown bear (*Ursus arctos yesoensis*) inhabits the island of Hokkaido and the neighboring Russian controlled islands Kunashiri and Etorofu. Until the latter half of the 19th century, brown bears were distributed throughout Hokkaido's mountains, plains, and coasts

Figure 7.4. 1993 estimated distribution of the brown bear (*Ursus arctos yesoensis*) on Hokkaido, Japan.



(78,073km²). However, after colonization and development of the island by the Japanese government beginning in 1871, low elevation temperate deciduous forests were mostly converted to cultivated and residential areas. Because developers considered bears to be agricultural pests and threats to human life, they were targeted for extermination.

The distribution of brown bears decreased from an area of approximately 47,000km² or 60% of the island in 1978 to roughly 40,000km² or 50% of the island in 1991 (Hokkaido Prefectural Government 1978). As a result of the development of major plains and riparian areas, five regional subpopulations are now recognized. Of these, the small size and isolation of the Western Ishikari subpopulation has warranted its listing as an endangered subpopulation in Japan's Red Data Book (Environment Agency 1991). Similarly, the isolation of the Oshima Peninsula (Figure 7.4) and a rapid decline in the distribution of the Teshio/Mashike subpopulation (Figure 7.4; Aoi 1991) have received recent attention.

Status

Based on interviews with local hunters, it was estimated that the 1992 population sizes ranged from 90 to 152 in the West Ishikari Region and from 84 to 135 in the Teshio-Mashike mountains (Hokkaido Institute Environmental Sciences 1995).

Legal status

Since the enactment of the Civil Law (1896), wildlife in Japan has been considered "without keeper." Only with collection do the rights to its possession become recognized under public law (The Civil Law, Article 239). At the same time, bears are considered a game species under the Wildlife Protection and Hunting Law (WPHL; 1918). In theory under this law, the harvest of wildlife is illegal, with exceptions made for "special purposes." In application these special purposes include, 1) wildlife protection and reproduction, 2) pest control, and 3) safe hunting, all of which contribute to "... the improvement of the human living environment," and "... the promotion of agriculture, forestry, and fisheries" (WPHL, Article 1). Thus, depending upon the interpretation of "appropriateness," it becomes a measure concerned with the protective breeding of wildlife and the extermination of wildlife pests via hunting. Indeed, excepting the special regulations governing the "technical capture" of species recognized to be in decline in Japan, the wildlife hunted or harvested as a pest becomes the property of the "collector."

The designation of Wildlife Protection Areas occurs under the WPHL (8-8), as long as their establishment is

recognized by the affected land-holding interests (WPHL, 8-8: 4). Compensation is available to those landholders affected by Special Protection Areas (WPHL, 8,9), but this option has never been applied on behalf of bear management.

The Law for Conservation of Endangered Species of Wild Fauna and Flora (LCES) was established in 1993 to “contribute to the assurance of the healthy and culturally rich lifestyle for present and future citizens by the protection of wildlife species” (LCES, Article 1). Taking, transferring, and trading of specific Endangered species are prohibited by the law, and habitat conservation can be designated. Brown bears in Japan are defined as International Endangered Species and commercial trade is regulated according to CITES guidelines.

As seen above, Japanese law shows little concern for wildlife as a renewable natural resource. Furthermore, although wildlife conservation enforcement should be tailored to regionally specific issues, the national WPHL restricts prefectural governments from initiating such management tools as a hunting tag system. With growing worldwide interest in sustainable resource use and the maintenance of biological diversity, reconsideration and revision of the Japanese law system is necessary.

Population threats

Excessive harvest continues to be the most immediate threat to the persistence of Hokkaido brown bears. Before the 1970s, average annual harvests exceeded 500 bears. Harvest numbers have declined in the last two decades, such that in the four year period between 1990–1993, the average annual harvest was 247 bears. Although there is little available information regarding changes in hunter effort, the decline in total harvest numbers can be interpreted as a decline in numbers at least in some regions. Mano (1990, 1993) demonstrated that in the Oshima peninsula, mortalities exceed allowable harvest rates for ensuring long-term persistence of that subpopulation, and Aoi (1990) documented the decline of bears in the Teshio/Mashike region. The Oshima Peninsula, the Hidaka mountain range, and the Kitami mountain area still support heavy harvests, while in the areas facing the sea of Japan, the range of mountains from the Shakotan peninsula extending toward Eniwa/Chitose, and the mountains from Mashike to the Teshio area, harvest is now minimal.

There has been great variation in total annual harvest, due mainly to fluctuations in the number of bears taken in damage control management actions. This is particularly notable from the mid-1960s through the early 1980s, when spring den hunts were used as a tool to minimize agricultural and other property damage. In recent years the ratio of controlled kills to sport harvest has declined, likely a result of the cessation of the spring hunt in 1990.

Vehicle collisions have become a considerable source of human-caused mortality. Between 1988 and 1992, there were five train related accidents, and two auto related accidents resulting in seven individual bear mortalities.

Habitat threats

Brown bear habitat in Hokkaido has been severely limited by human activities, especially forestry practices and road construction. Forest development increased after the World War II, reaching its greatest intensity between 1960–1975. At that time, the area of natural forests declined as conifer plantation forestry became standard practice. As a result of this change in forest composition, fewer stands of beech, oak, and other mast producing hardwoods trees are available as food sources and denning sites. Because beech family trees typically require at least 20–30 years of growth before producing any mast, even second growth natural forests are only slowly returning to productive habitat. Against this slow restoration, the road network continues to grow, further subdividing habitat areas and increasing the volume of people with which bears must contend.

Management

After Japanese colonization of Hokkaido in the late 19th century, brown bears were considered a dangerous impediment to development of the island. Conservation efforts have only begun in recent years, when it became apparent that annual harvest levels are likely unsustainable.

The sports hunting season for brown bears extends from October 1 to January 31 of the following year. Licensed hunters in Hokkaido are able to harvest all game species, so incidental harvest of bears may be high. There is no limit to the number of bears that can be taken by a single hunter. Also, there are no restrictions on age or reproductive status of bears taken as game. Hunting is forbidden in “special wildlife protection areas”, “closed hunting areas”, and in “special protection areas” within National Parks, but other lands are basically open to hunting. Use of guns in hunting, as well as traps in damage control actions are allowed as capture methods.

Damage control kills are allowed all year long throughout all regions of Hokkaido in cases where bears are considered a threat to crops, property, or human safety. Control kills are carried out in each region by members of the local hunting organization, with per diem compensation and bounties provided by local governments. The increasing average age and decreasing number of hunters in Hokkaido may lead to a situation where “necessary” pest control kills cannot be carried out in a particular area (Aoi 1990).

Government recognition of the need for wildlife conservation and management based on scientific studies has grown slowly since the first national studies of wildlife distribution in the 1970s and 1980s. From that period, the government of Hokkaido began to gather biological data on the bear (Hokkaido Prefectural Government 1986, 1987). In 1991, Hokkaido built the nation's first prefectural level Institute for Environmental Sciences. The Wildlife section within its Natural Environments Research Branch now carries out research in earnest.

With field research indicating a decline in bear distribution (Mano 1993, 1990a; Aoi 1990; Hokkaido Government 1994, 1995), the Hokkaido Government has begun to re-examine its long-standing policy of proactively decreasing bear numbers. The use of box traps and leg hold snares during the sports hunting season were forbidden in 1985 and 1992 respectively. After it became clear that spring den hunting (government sanctioned since 1966) was heavily impacting subpopulations in areas of deep snow (Aoi 1990), the government eliminated that special season in 1990. Recent efforts have included the distribution of pamphlets describing bears for the general public, and a National Hunter's Association self-imposed limit on bear harvests. These steps offer some hope for coexistence between humans and brown bears on Hokkaido.

Human-bear interactions

Although brown bears are a highly valued game animal, the difficulty of the hunt limits the number of hunters who pursue them. The greater challenge for decreasing human-caused mortality is in the system of damage control kills. Most control kill actions occur in rural mountains and farming areas, where the possibility of damage to crops and danger to humans is feared. Bear-caused human injuries were high in the 1960s but have decreased in recent years. Bear-caused damages to agriculture were estimated to be US\$931,750 in 1993 (Hokkaido Government Nature Preservation Division unpublished Internal document 1994). In government produced cautionary pamphlets, the inappropriate disposal of trash and agricultural and marine refuse has been recognized as a major attractant and thus an ultimate cause of conflict, (Yamanaka 1986; Mano 1990a, b; Hokkaido 1992), but more thorough public outreach is necessary.

Public education needs

There is a great need to increase the level of public awareness regarding the natural history, current population status, and habitat conservation needs of the brown bear in Hokkaido. This is most important for preventing human injuries and property damage, and for improving local

acceptance of the bear. A number of policies and programs should be developed to redress this situation.

First, a public education program should be established to introduce the findings of scientific research on bear-habitat interactions and the disruptive effects of human activity on them. This is necessary not only to prevent damages or accidents involving bears, but also to affect a change in citizens' attitudes towards them. In regions inhabited by bears, the fear and loathing of them remains strong. This may reflect the strength of stories passed down of historic damages and accidents. It also results from the lack of public outreach that conveys research findings or guidelines that could minimize conflicts and damages. Few people understand that casually discarded garbage creates food-conditioned bears and can invite later damage. Problem prevention outreach programs should be directed to forest workers, hikers, fishers, food gatherers, and other outdoor enthusiasts who spend their time in bear habitat.

A number of approaches should be used to create outreach programs on several audience levels. This should include specific recommendations on minimizing conflicts with bears for people living near bear habitats, as well as elementary and middle school programs describing the critical role of the brown bear in the natural history of Hokkaido. This outreach activity should not be limited to the realm of government wildlife agencies, but should be carried out cooperatively with foresters, land developers, teachers, non-governmental organizations, and journalists.

Conservation and management recommendations

The history of forest development has brought human settlements into close contact with habitat areas favored by brown bears (Mano 1994). The two most pressing concerns for brown bear management in Hokkaido are how to control total harvest numbers and how to conserve habitat. Furthermore, a system for assessing brown bear population status and human attitudes toward their conservation is necessary. Wildlife management staff who can respond to damage problems and potentially dangerous situations should be placed in the field to ensure the support of local communities for management plans. Such a program will require the input and cooperation of government and non-government organizations as well as the commitment of adequate financial support.

The current reliance on the removal of "problem bears" should be reconsidered. Brown bears show apparent behavioral variation by individuals, often a result of situation specific learning (Stirling and Derocher 1990). Rather than treating all bears encountered as pests, a management system that recognizes and responds to food conditioned and similarly dangerous bears will help avoid

serious human injury (Interagency Grizzly Bear Committee 1986) while better controlling the total number harvested. The identification of nuisance bears and notification of people in the area is important for gaining public support for management. Various management options such as the relocation of nuisance bears, the use of electric fences and other deterrents, and compensation systems should be considered in addition to traditional reliance on removal of bears.

Bear habitat conservation should become a consideration of the forest planning process, road construction, and other development projects. The regrowth of low elevation deciduous and mixed forest habitats neighboring cultivated land and residential areas may contribute to an increase of bear-human interactions (Mano 1994). It will become increasingly important to restore important bear habitat areas away from cultivated or residential areas to assure long-term conservation of the bear. As a part of this, the forest management system should encourage the re-establishment of mast producing deciduous stands instead of its historic reliance on second growth conifer plantings. Finally, minimizing habitat fragmentation by protecting linkage areas between subpopulations, and through the closure of unused forest roads should also be encouraged.

A third area of concern relates to the international trade in bear gall bladder and other parts. A strategy should be developed to inform the Japanese public of the connection between the regulation of trade and worldwide bear conservation. Since many people in Japan might interpret an attempt to regulate current wildlife consumption practices as a critique of Japanese culture, mere criticism could cause an emotional nationalistic response. Government agencies, NGOs, and the media in Japan must all participate in the development of an appropriate information program.

Finally, successful conservation practices that encourage social acceptance for coexistence with a large mammal like the bear require much work! Proactively addressing these problems requires a learned, experienced, and committed work force. Unfortunately, the need for well-trained wildlife management personnel is not well recognized among the Japanese people. The future of brown bear conservation in Japan will depend in part on the creation of a system that nourishes the development and placement of these well-trained wildlife managers.

Status and management of the Gobi bear in Mongolia

Thomas McCarthy

Historic range and current distribution

The Gobi bear (*Ursus arctos*), or *mazaalai* as it is commonly referred to by local peoples, may well be the rarest animal of the People's Republic of Mongolia. Listed in both the IUCN and Mongolian Red Books, the bear is found only in the isolated southern massifs of the trans Altai-Gobi. Its current range (Figure 7.5) falls entirely within the boundaries of the Great Gobi National Park and Biosphere Reserve (GGNP). Situated in the southwestern corner of Mongolia, GGNP is presently the largest nature reserve in that country. Established in 1976, the park is comprised of two disjunct sections. Sector A, the larger of the two, is 44,190km² in size and supports populations of several rare and endangered species, including all known *mazaalai*. While little investigation of this secretive species has been conducted, available information suggests that as few as 30 animals may remain. Living in the harsh environment



Figure 7.5. Distribution of the Gobi bear (*Ursus arctos*) in Mongolia.

of the Gobi desert, the bear's continued existence is considered precarious.

The first recorded reports of an unknown bear dwelling in the Gobi come from the notes of V. Ladygin. In 1900 he found its tracks and diggings near Tsagan Bogd, Tsagan Burgasny-bulak, and Shar Khulst; all sites that are still thought to support small populations of the bears. Joint Soviet and Mongolian scientific expeditions in the mid-1930s were unsuccessful in studying the bear due to its rarity. The first confirmed observations of a Gobi bear did not come until 1943 during an expedition carried out by the Science Committee of the Mongolian People's Republic. The results of that investigation are detailed by Bannikov (1954) who first described the distribution and ecology of the bear. In the 1960s and early 1970s, Mongolian scientists further defined the range of Gobi bears. With the establishment of the GGNP in 1976, emphasis was placed on investigating the distribution, number, and ecology of the bear. Additional data, particularly on distribution, was made available by researchers on the UNEP funded project of 1980–83.

Bannikov (1954) suggests that range of the Gobi bear previously extended as far east as the Tost-Ula mountains some 50km east of the present Park boundary. That population may have been extirpated by hunting. As late as 1970, the northern border of their range was reported to be near the Edrengeyn mountains and included the Aj Bogd range. Since that time their range may have been reduced by as much as half. Gobi bears are thought to be restricted entirely to the southern half of the GGNP; an area of some 15–16,000km², although there have been recent reports of the bears making movements into the Gansu Province of China. Within the Park, bear activity is centered around Atas Bogd, Shar Khulst, and Tsagan

Bogd mountains and associated oases. Individual home range size has not been determined. Zhirnov and Ilyinski (1986) felt that range sizes varied seasonally with food availability, but that bear ranges remained relatively small and individuals rarely ventured far from oases. Despite the use of radio collars, Schaller *et al.* (1993) obtained only incomplete data on range size, in part due to logistic problems. However, in contrast to Zhirnov and Ilyinski's contention, they found one male bear to have a minimum home range size of 650km² with north to south movements exceeding 48km, taking him far from the oasis on which his activity was centered. There have been no apparent attempts to document movements of bears between activity centers, thus leaving unaddressed the important question of population isolation within the range.

Status

After apparent declines since 1970, population estimates for the bear have been relatively constant since the early 1980s. Zhirnov and Ilyinski (1986) estimated that 25–30 bears remained in the early 1980s. Schaller *et al.* (1993) believed that was still a reasonable estimate after conducting surveys in 1990. Reports on recruitment rates are sporadic and incomplete.

The status and ecology of the Gobi bear have yet to be thoroughly investigated. Its general food habits have previously been reported (Bannikov 1954; Zhirnov and Ilyinski 1986; Anon. 1988; Schaller *et al.* 1993), however, there have been no attempts to delineate seasonal diet shifts, or changes in food selection in response to annual fluctuations in forage availability as mediated by weather or other factors. Availability or biomass of bear forage



Gobi bear habitat in the Great Gobi National Park and Biosphere Reserve, Mongolia.

T. McCarthy

plants within the Park has not been quantified. Also lacking are data on distribution, population size/trend, and such parameters as age at first reproduction, average litter size, mortality and natality rates, denning ecology, breeding behavior, or intra-specific contact.

Taxonomic status

The question of taxonomic status of the Gobi bear has yet to be settled. In contrast to other brown bears, Gobi bears are relatively small with reports of adults weighing between 100kg (Anon. 1988) and 120kg (Schaller *et al.* 1993). It is light brown in color, and the head, belly, and legs can be noticeably darker than the rest of the body. Light stripes or a collar are often discernible about the neck, and the ears often have long shaggy hairs (Anon 1988, Schaller 1993a). Assuming similarity to the Tibetan brown bear, mazaalai have been referred to as *Ursus pruinus* Blyth, 1854 or *U. arctos pruinus* (Mallon 1985; Zhirnov and Ilyinski 1986). Schaller *et al.* (1993), having observed both the Gobi bear and the brown bears of the Tibetan Plateau, note distinct differences in appearance and question the likelihood of them being the same species or subspecies. The Tian Shan and Altai mountain ranges nearly converge in close proximity to the GGNP and both ranges support populations of brown bear. *U. a. isabellinus* occur in the Tian Shan within sight of occupied Gobi bear range, while *U. a. arctos* can be found where the Altai range crosses through northwest Mongolia and into Russia. The latter subspecies is also present in several northern Mongolia locations including the taiga forests of the Khentai and Khovsgol regions. Although local inhabitants can not recall a time when brown bears inhabited the Altai

mountains to the north of the Park, Schaller *et al.* (1993) speculate that this must have been the case. Although the past known distribution of Gobi bears may then have overlapped with *U. a. arctos*, they believe the Gobi bear to have its closest affinity with *U. a. isabellinus*, assuming that subspecies is valid. Sokolov and Orlov (1992) established the Gobi bear as a distinct species, *U. gobiensis*. However, they base that contention on morphological measurements from a limited number of individuals, thus leaving the new taxonomic distinction questionable. A study was planned for 1995 that would deal with the taxonomic question through modern genetic analyses.

Legal status

The Gobi bear receives complete protection in Mongolia and appears in the national Red Book. It is also listed in the IUCN Red Book, but is considered the same species as the Tibetan brown bear. All brown bears in Mongolia and China are listed in Appendix I of CITES, including the *U. a. arctos*, *isabellinus*, and *pruinus* subspecies. Mongolia has indicated it will accede to CITES and was in attendance at the 1995 world council session. Final action is pending in the Mongolian Great Hural (Parliament). It is anticipated that they will join without taking any species reservations.

With the fall of communism early in this decade, Mongolia entered into a new era of democratic rule and is still in the process of promulgating numerous laws pertaining to natural resource management. Two laws enacted in 1995 will have ramifications on Gobi bear conservation. These include the Mongolian Law on Hunting and the Special Protected Areas Law. Under the



Gobi bear (*Ursus arctos*) in Mongolia.

Joel Bennett

Hunting Law there is no provision for the taking of a mazaalai, although there is a season specified for brown bear elsewhere in the country. Mazaalai are listed as a “very rare” species and thus protected even outside the boundaries of the GGNP. Translation of the new law into English has left unclear the question of taking mazaalai for scientific collections, such as zoos or museums. This needs clarification. The Special Protected Areas Law provides definitions of the various protected area designations. The GGNP falls under the Strict Nature or Scientific Reserve category. Within these types of reserves three management zones may be designated. Most of Gobi bear habitat in the GGNP is reportedly designated Zone I with the remainder in Zone II. Under Zone I guidelines only limited research activities are allowed. Tourism, hunting for the purpose of research or population control, soil and flora rehabilitation, fodder production, and forestry are disallowed in Zone I, but possible in Zones II or III. No sport or subsistence hunting is allowed in a Strict Nature Reserve.

Population threats

With a population that likely does not exceed 50 animals and may be as low as 25, the bears are without question highly inbred. Three population centers are now thought to exist and limited genetic interchange between them may be further reducing population viability. Existing at the absolute fringe of the species’ ecological tolerance, Gobi bears subsist on a marginal diet. Scavenging carcasses or the taking of small rodents may supply a limited amount of animal protein, but the bulk of the diet is vegetable matter. Graminoids, often the senescent, dry over-winter remains in early spring, are the principal natural food. Roots of wild rhubarb (*Rheum nanum*) and onion (*Allium* sp), and *Nitraria* and *Lycium* berries add seasonal variety. The low quality diet may provide for little beyond maintenance needs; a situation that likely contributes to an observed reproductive rate that is low even for the species. Females are rarely seen with more than one young.

Water is a precious commodity in the Gobi and several years of severe drought in the 1980s may have put additional pressure on the bears as green plants became even more scarce and oases dried up. While there was no readily apparent decline in numbers between surveys conducted in the early 1980s and estimates made in the 1991, the effect of any lost or reduced cohorts may not yet have been fully felt.

Habitat threats

Despite the fact that Gobi bear range lies completely within the GGNP, a strict nature reserve with restrictive

provisions on human use, there are habitat threats. In the past few years Mongolia has greatly increased trade with China. In August 1992, Mongolia and China signed a border agreement to promote trade. Several trading posts were established on both sides of the border, including one opposite the GGNP in China. Two roads through the Park were established that ran past oases in Gobi bear range. After two years of protest by the Mongolian Ministry of Nature and Environment and international conservation organizations, the roads were officially closed and the Chinese trading post removed. The road closure is, however, difficult to enforce given the limited human and transportation resources of the Park. Illegal travel continues and may be increasing. Poaching and disturbance of animals at oases is likely an ongoing problem.

Several military border stations exist within the Park. Some are sited at oases and livestock are kept at all posts. This situation causes disturbance to local wildlife and deprives them of already rare water sources. The potential for poaching is real and the incentive high given the value of bear galls on the Chinese market. While trade is being advanced between the countries, Mongolia remains convinced of the need for military stations along its border with China and removal is not likely in the near term. Elimination of all military posts may in fact have a negative impact on the Park, as cross-border poaching would likely increase without their presence.

At present there is a strong national interest in promoting eco-tourism. The Gobi Park is presently not open to extensive visitation and no facilities exist to support that. The Ministry of Nature and Environment in cooperation with UNDP’s Biodiversity Project is currently revising the GGNP management plan. The plan will address tourism with respect for the critical habitat areas that include oases within Gobi bear range.

Management

Concurrent with the dissolution of the Soviet Union, Mongolia experienced a period of rapid change, yielding economic and political crisis. The loss of the USSR as a trading partner and cooperator in scientific endeavors within Mongolia was apparent in much reduced management activities in the national parks and reserves, and near elimination of the research functions of the Mongolian Academy of Sciences. With a new openness to the west, several foreign entities, private, national, and international, have stepped in to provide aid directed at maintaining Mongolia’s unique natural heritage. George Schaller of the Wildlife Conservation Society (WCS) initiated research on several Mongolian species in 1989, including the Gobi bear. In 1993, UNDP established a Biodiversity Project in Mongolia that is ongoing and

focuses much of its attention on the GGNP. Despite the concern that both UNDP and WCS have expressed over the plight of the bear, there is presently no research being conducted on the species. In 1995 the GGNP and the Mongolian Ministry of Nature and Environment (MNE) identified the Gobi bear as a species of special concern and in need of immediate protective measures and additional research. Clearly, appropriate and more effective conservation efforts cannot be undertaken until a better understanding of the bear's population status, ecology, and genetic standing is gained.

Management is currently limited to providing supplemental feed and efforts to reduce human contact by limiting access to oases where bears seek natural food and water. In the mid-1980s, the Park established a number of feeding stations and have continued to provide livestock pellets as a supplement to the meager natural diet. Foods of higher nutritional value could be more effective in elevating the bears reproductive rates, but are beyond the limited financial means of the government at present. Simple fecal analyses to determine seasonal diet shifts and to identify yearly trends could be conducted by current park staff. Annual production of *Nitraria* berries, a critical high caloric food, could then be used as an indicator of bear's nutritional plane, thus allowing managers to provide additional or higher quality supplements during critical years.

Mongolian officials have suggested that a captive breeding program for this species be initiated. Such a program is currently beyond the capabilities of the GGNP and is of questionable value at best. It is uncertain if bears would breed well in captivity and the difficulty of returning "uneducated" young to the harsh wilds of the Gobi may doom any such effort to failure. Besides, these bears have managed to maintain a small but stable population with limited human interference. Because the loss of even a single reproductive female from such a small population would be extremely deleterious, any management or research activities that call for capture or handling bears should receive the most critical review.

At present few Mongolian wildlife biologists are prepared, trained, or equipped to conduct the types of studies required to address even basic wildlife management needs. The key to responsible management of their unique faunal complex may be recruitment of a cadre of Mongolian biologists interested in conducting the demanding long-term field investigations required. Limited resources and low salaries, coupled with a new reliance on western experts to lead most research, is not conducive to the development of national capabilities. To that end, international research and management experts must be coupled with motivated Mongolian counterparts that can be both trained and equipped, leading to a self-reliance not apparent today. This is occurring on a limited basis now with promising results.

Human-bear interactions

Many human-bear interactions are inextricably linked to habitat threats and have been discussed above. Other anthropogenic disturbances have arisen from sources such as foreign film crews documenting the Park's unique wildlife complex. While responsible teams have managed to attain footage of rare species with little or no disturbance, recent cases have been brought to light where actual physical injury to Gobi bears likely occurred in the process. A strict policy on such activities is needed.

Internal interest in research on Gobi bears and other rare species of the Park is increasing. Management actions, such as additional radio-telemetry studies, captive breeding, and translocating bears to facilitate genetic exchange have been promoted by both Park biologists and senior scientists within the MNE and the Mongolian Academy of Sciences. Until such activities can be skillfully and safely carried out, they should be discouraged. More importantly, the rational and potential efficacy of the programs should first be thoroughly examined with input from expert sources. As an example, it is unlikely, or at a minimum unproven, that an impediment to genetic exchange between oases exists. Thus, the proposed translocations are unwarranted and potentially disastrous.

Public education needs

In a pastoral society such as Mongolia, predators of all forms are usually vilified. Perhaps because its range has been reduced to the uninhabited and desolate reaches of the Gobi, mazaalai enjoy a somewhat unique level of respect from Mongolians. Still, general wildlife conservation ethics and the concept of parks and reserves that exclude or limit human use should be promoted through public education efforts.

Mongolia has greatly added to its protected areas system over the past few years, and laws governing natural resources and land use/ownership have even more recently come into being. Nomadic herders that make up more than 50% of the country's population are often unaware of or confused by the rapid changes. To maintain and foster a respect for protected areas and the country's unique natural heritage Mongolia, in cooperation with such entities as the UNDP Biodiversity Project, has initiated a multi-faceted educational campaign. Mongolia is fortunate among developing countries to have a very high literacy rate which allows use of widely disseminated written materials. Additionally, despite its sparse and nomadic populace, radio and even television reach most areas. There is a strong interest among urban and especially rural people in learning about local natural

history. During this critical period in Mongolia's development, when revenue generating resource extraction is being weighed against conservation of biodiversity, an extensive, well-funded, and effective educational program is highly desirable.

Of particular concern for many species in Mongolia is the increasing trade with China where demand for wildlife parts, including bear galls, is high. Any educational efforts to address this issue need to be carefully crafted so as not to result in a counter-productive increase in awareness of the trade value of rare species.

Specific conservation recommendations

1. The acquisition of basic ecological information on Gobi bears is an integral component of establishing sound conservation and management plans. Most importantly, the genetic standing of the bear must be more clearly established. Such information is critical to determination of the type and extent of conservation actions.

In the spring of 1996 field collection of bear hair tissue for DNA analysis was to be initiated using techniques that minimize potential risks or disturbance of the bears. Collection sites were to be selected after consultation with GGNP staff. At least three oases will be sampled with consideration of the goal of identifying population isolates. The study goals include establishing a minimum population estimate, determination of sex ratios, determination of inbreeding patterns and genetic exchange between known population centers, identification of isolated populations (if they exist), and the relation of mazaalai to other Asian brown bears.

Field work was to be completed in spring of 1996 and laboratory analyses by summer of that year. Final reports were expected in late winter with management recommendations being provided to Mongolian officials and Park managers at that time. The budget for this project was approximately US\$11,000. This work was possible at that funding level due to association with other ongoing research in the Park under the auspices of WCS.

2. Supplemental feeding should be continued. Costs of this activity are moderate and currently supported by the GGNP's annual budget.
3. Park rangers and biologists need to establish standardized monitoring activities. These can be as simple as sign counts along walked transects, but must be repeatable and done on a regularly scheduled basis; annually would be best, but semi-annually should be a minimum target. No more than four months per year would be required. Fuel, food, and personnel costs should not exceed US\$500.

4. A more detailed examination of the mazaalai's diet should be undertaken with an emphasis on seasonal variation. Annual assessments of key forage production should follow as an index to nutritional status of the bears. Fecal analysis to identify diet content is possible at the existing Park headquarters in Bayantooroi. Costs would be minimal as collections could be made during scheduled trips to oases by rangers and other staff. Any nutritional analyses would need to be conducted at a laboratory in Ulaanbaatar, or outside the country. Costs would vary by lab but would be least expensive if done in-country.
5. A management plan for the Park is now being formulated. It should contain an action plan for this species with emphasis on limiting disturbance factors. The above research and management recommendations have been forwarded to the Park and the international team now working on the plan.

The level of conservation actions that should be taken for these bears is partly dependent on its taxonomic standing. Yet even if it is determined to be the same subspecies as bears of the Altai, Tian Shan, or Tibet plateau, the uniqueness of its ecological situation, existing as a remnant population under extreme environmental conditions, justify actions to prevent its demise. National pride in the *mazaalai* is arguably a valid impetus to protect them and even seek to promote an expansion into former range.

No management or research activities should be conducted that would place individuals or the population at risk without extensive international peer review. Such actions include capture for any reason, movement or translocation, and attempts to establish an artificial breeding program.

Status and management of the brown bear in Russia

Igor Chestin

Status

Russia has the largest brown bear population in the world, apparently exceeding populations in other countries altogether. In most areas, it is a common game species. Brown bears are found in almost all forests from Kola Peninsula in the northwest to Khanka Lake in the Russian Far East (Figure 7.6). Bears also reside in the mountains of the Caucasus and Altai in the south of Russia. A 1990 survey of brown bear numbers in Russia estimated about 125,000 animals (Table 7.3). That was probably the maximum number during the 20th century, when the bear population experienced a decrease until the late 1960s. The most dramatic increase in brown bear numbers in the 1970s–1980s occurred in European Russia.



Figure 7.6. Brown bear (*Ursus arctos*) range in Russia, 1993.

Historic range and current distribution

Historic range of the brown bear in Russia was estimated by Geptner *et al.* (1967). The former range of the species included not only forests, but also forested steppes, floodplains along Volga and Don valleys, and even steppes. Thus, in the 18th century brown bears occurred throughout Russia, except for the marginal north tundra areas, and the dry steppe to the southwest and southeast of Baikal Lake.

The northern and eastern borders of brown bear distribution did not change significantly until recently. The northern border coincides with the boundary between forested tundra and tundra zones. The eastern border follows the Pacific coast. Bears still inhabit Paramushir, Iturup, and Kunashir islands, but are extinct on Shumshu in the Kurils. Shantar Islands and Sakhalin are still inhabited by the species.

The distribution of brown bears in Eastern and Central Siberia is nearly the same as it was several hundred years ago, although bears disappeared from some extensively developed territories along the Baikal-Amur railway, and coal mining areas in Kemerovo oblast. However, in the 19th and especially in the first half of the 20th century, brown bear range was progressively shrinking northwards

in European Russia. In the 18th century bears were spread as far to the south as the Crimean Peninsula, thus inhabiting almost all of the Ukraine. Since that time the southern border of their distribution has moved, in some places 1,000km to the north. In the 1940s–1950s bears disappeared in Moscow and Vladimir oblasts, and some parts of Tver (former Kalinin), Smolensk, Bryansk, Kaluga, Orel, Ivanovo, and Tambov oblast. This process continued approximately until the 1970s, as confirmed by surveys done in Okskiy Reserve (Priklonskiy 1967; Polyakova 1975).

The most recent survey, completed in 1992 in European Russia (Chestin in press) showed great expansion of the brown bear range southwards. Bears became resident in all the Tver oblast, in the north of Moscow oblast, and in Kaluga oblast. Population density also increased in all of European Russia (Chestin *et al.* 1992). There are also four to six isolated populations in Bryansk, Nishniy Novgorod, Ulyanovsk, and Orenburg oblasts, and in Mordovia and Chuvashia. The status of these populations is unknown, as no special study has been carried out on any of them. Considering the Russian part of the Caucasus, one can see progressive narrowing of the brown bear range, especially since the end of the last century. Before that time the species' range was probably pulsing towards the European

Table 7.3. Number and density (individuals per 1,000km²) of brown bears (*Ursus arctos*) in different regions of Russia in 1990 according to the official data of State Department for Game Management.

| Region | Center of administrative unit | Number | Density |
|--|-------------------------------|----------------|-------------|
| North and middle taiga of European Russia | Arkhangelsk | 6,500 | 0.21 |
| | Murmansk | 500 | 0.05 |
| | Petrozavodsk | 3,500 | 0.20 |
| | Siktivkar | 7,000 | 0.17 |
| | Total | 17,500 | 0.18 |
| South taiga and north temperate forests of European Russia | Vologda | 4,500 | 0.31 |
| | Tver | 1,800 | 0.21 |
| | Kirov | 4,000 | 0.33 |
| | Kostroma | 2,000 | 0.33 |
| | Sanct-Peterburg | 1,900 | 0.22 |
| | Novgorod | 1,350 | 0.24 |
| | Pskov | 700 | 0.13 |
| | Yaroslavl | 700 | 0.19 |
| Total | 16,950 | 0.26 | |
| Temperate and steppe forests of European Russia | Bryansk | 10 | ? |
| | Nizhniy Novgorod | 600 | 0.10 |
| | Ivanovo | 200 | 0.08 |
| | Kaluga | 3 | ? |
| | Yoshkar-Ola | 400 | 0.17 |
| | Saransk | 20 | ? |
| | Moscow | 10 | ? |
| | Ryazan | 8 | ? |
| | Penza | 10 | ? |
| | Smolensk | 200 | 0.07 |
| | Kazan | 3 | ? |
| | Izhevsk | 15 | ? |
| Total | 1,479 | ? | |
| Mountain taiga of Ural | Ufa | 1,500 | 0.21 |
| | Perm | 4,000 | 0.25 |
| | Yekaterinburg | 3,000 | 0.15 |
| | Chelyabinsk | 400 | 0.15 |
| | Cheboksari | 600 | 0.14 |
| | Total | 9,500 | 0.19 |
| Mountain forests of the Northern Caucasus | Makhachkala | 150 | 0.10 |
| | Nalchik | 200 | 0.20 |
| | Krasnodar | 470 | 0.19 |
| | Vladikavkaz | 100 | 0.25 |
| | Stavropol | 290 | 0.18 |
| | Grozniy | 200 | 0.26 |
| | Total | 1,410 | 0.18 |
| Plain taiga of West Siberia | Kemerovo | 900 | 0.14 |
| | Novosibirsk | 230 | 0.04 |
| | Omsk | 400 | 0.06 |
| | Tomsk | 3,000 | 0.09 |
| | Tyumen | 4,500 | 0.04 |
| | Total | 9,030 | 0.06 |
| Mountain taiga of Altai | Gorno-Altaysk | 5,000 | 0.40 |
| Mountain taiga of East Siberia | Irkutsk | 4,000 | 0.05 |
| | Krasnoyarsk | 10,000 | 0.05 |
| | Kyzyl | 2,500 | 0.21 |
| | Total | 16,500 | 0.06 |
| Plain taiga of East Siberia | Ulan-Ude | 3,000 | 0.12 |
| | Chita | 2,500 | 0.08 |
| | Yakutsk | 12,000 | 0.04 |
| | Total | 17,500 | 0.05 |
| Taiga and broad-leaved forests of the south Far East | Blagoveshchensk | 3,500 | 0.10 |
| | Magadan | 3,500 | 0.04 |
| | Vladivostok | 2,500 | 0.15 |
| | Khabarovsk | 8,000 | 0.10 |
| | Yuzhno-Sakhalinsk | 2,500 | 0.29 |
| | Total | 20,000 | 0.08 |
| Mountain taiga and tundra of Kamchatka | Petropavlovsk-Kamchatskiy | 9,000 | 0.19 |
| TOTAL FOR RUSSIA | | 123,869 | |

part of the range depending on climatic and therefore vegetational changes (presence or absence of forests in the river valleys and steppe zone lying between the Caucasus, and broad-leaved forests roughly to the north of 50°N) (Vereshchagin, 1959; Geptner *et al.* 1967). No restoration of the former range has been observed recently.

In conclusion, the range of brown bears did not experience significant changes during the last two centuries in the Far East and Eastern Siberia, slightly narrowed in the south of Western Siberia, and dramatically moved to the north in south-European Russia. However, in the last two decades, a new expansion to the south has occurred, and there are still several vulnerable isolated populations which give some indication of the species distribution 100 years ago.

Regarding possible future range, it probably will not change in Asian Russia, although a decrease in number can be expected in the Far East due to extensive poaching. In European Russia, the species range can continue its expansion to the south, but some isolated populations farther in the south may disappear if special measures are not undertaken. In the Russian Caucasus, the expansion of bear range may be limited by continuing development.

Legal status

Brown bears have always been, and still are, traditional game animals. Moreover, in areas with extensive agriculture (like European Russia) bears were eliminated because of livestock depredation. Land owners often paid bounties for eliminating brown bears on their lands, while others, in contrast, prohibited hunting to keep bears for their own game. The above is true mostly for European Russia, while in remote Asian parts of the country people hunted bears very rarely, although hunters killed bears when encountered in the taiga.

After the October Revolution in 1917, bears were declared harmful predators and their elimination was promoted by the state in the form of bounties, or by the land users (mainly collective farms) who rewarded hunters with livestock or grain. Only in the 1950s was that practice canceled in several oblasts of central European Russia, where bears were nearly extinct by that time. By 1960, bear hunting was prohibited in all European oblasts to the south of Moscow's latitude, but bounties persisted in Asian Russia until 1970. In the 1960s more and more oblasts started to regulate bear hunting by setting the seasons (usually from mid-August until mid-May, sometimes until the end of denning), or even by introducing free licenses as in Krasnodar kray. In 1974, bear hunting in Russia was restricted to three months with particular seasons set between the 15 August and the 15 January by local authorities. Bounties were canceled and sows with cubs of the year were not allowed to be hunted. More and

more oblasts in European Russia, like Bryansk, Kaluga, Tula, Orel, Ryazan, and Vladimir listed brown bears as protected species.

In 1981, the Head State Department of the Game Industry of the Russian Federation (Glavokhota RSFSR) established a license system for bear hunting throughout Russia. The price for the license was 70 roubles (approx. US\$115) in European Russia and 50 roubles (approx. US\$80) in the Asian part of the country. This system, despite being opposed by many specialists who called for free licenses for at least Asian Russia, is still active although the prices are different and are finally set by local authorities. Bear hunting remains prohibited in Vladimir, Ivanovo, Ryazan, Moscow, Orel, Tambov, Ulyanovsk, Bryansk, and Kaluga oblasts, and in Mordovia, Chuvashia, and Tatarstan.

Population threats

Besides game hunting, brown bears in Russia are also killed if they become nuisance animals (preying on livestock, damaging crops or beehives, or attacking humans). In some areas poaching is extensive and can lead to a population decrease. In a healthy bear population, the impact of the elimination of nuisance animals is very small.

According to data obtained during a survey on brown bear-human interactions (Chestin 1993), the number of permits annually issued for eliminating nuisance bears vary from 0 to 0.6% of the total bear population in 20 different regions, with an extraordinarily high figure (3.5%) in Novosibirsk oblast. Assuming that the success of eliminating nuisance bears is slightly higher than 50%, the role of this management measure is really limited. Of course, some nuisance bears are eliminated by land users, herd keepers, and apiarists without being reported, but these losses are hard to estimate.

In some areas in Siberia (especially in the Baikal area) there are years of bear disaster when the crop of their ultimate autumn food, Siberian pine nuts, is very low. This forces bears to approach settlements in search for alternative food, and many bears become very aggressive. In such years, special teams of hunters are organized to eliminate bears from the vicinity of human settlements, and associated population losses can be really dramatic. For example, the data given by Zhdanov and Pavlov (1972) provided the evidence that a brown bear disaster in 1962 and 1968 took place in all Asian parts of Russia, at least from Tomsk oblast through Krasnoyarsk kray, Irkutsk oblast, Buryatia, Amur oblast to Khabarovsk and Primorskiy krays, and Yakutia. In the summer and autumn of 1962, 13 bears were shot near one village in Krasnoyarsk kray. More than 60 bears were shot in the vicinity of another village in the same district. One hunter in Buryatia reported that he killed 11 bears in the period of

August 20–September 20. According to Zyryanov and Smirnov (1992), in Tuva Republic, 1951–52, 1962, 1972, and 1978 were the years of bear disaster. Seven hundred sixty-seven bears were shot in Tuva (119,400km²) in 1962. Together with those who died because of starvation and cannibalism, the losses approached 1,000 individuals, or 67% of population.

Poaching can be subdivided into commercial and non-commercial, the former done for trade, and the latter for the personal needs of a poacher. Non-commercial poaching always existed in Russia and probably did not seriously affect bear populations. Extensive commercial poaching arose fairly recently.

Commercial poaching does affect brown bear populations, especially in the Russian Far East. Surveys done in 1992–1993 (Poyarkov and Chestin 1993; Chestin and Poyarkov in press) showed a dramatic increase in poaching for bear gall bladders, and to a lesser extent for hides, in 1990–1991. Before that, it existed to a very small extent in the south of the Far East where many North Koreans have been working for the timber industry. They purchased bear gall bladders from local hunters and then sold them in North Korea and China. Recently the demand for wildlife parts in South East Asia has dramatically increased due to rapidly growing living standards, and hence the ability of more and more people to use traditional Asian medicine which they formerly could not afford. This unfortunately coincided with impoverishment of the Russian population and the weakening, if not loss of, state services including both wildlife and customs control.

Surveys demonstrated that in 1991–1993 many people poached for a living, illegal networks of dealers were established, and wildlife products, including brown bear bile and hides, found their way abroad through all big cities in the Far East. The international airports or ports used for this trade included Vladivostok, Nakhodka, Khabarovsk, Blagoveshchensk, Magadan, and Petropavlovsk-Kamchatskiy. Not all of the products went through organized dealers. Dispersed trade by sailors was also very prevalent particularly for illegal export to Japan.

According to our data (Chestin and Poyarkov in press), the Far-Eastern trade network accumulated bear products from the regions between Pacific Ocean and the Yenisey River. To the west of the Yenisey River, poachers sell bear parts to dealers from European Russia (Moscow and Saint Petersburg), the Baltic countries, and the Ukraine.

The impact of poaching on bear populations is hard to estimate and only a few such estimations have been recently undertaken. Zheleznov (1993) from Anadyr, Chukotka reported great reductions in bear numbers because of poaching done by domestic reindeer herdsman. According to his data, a team of herd keepers eliminates up to 35 brown bears each spring. There are about 100 such teams in the region and even if only 10% of them are engaged in poaching, the annual population loss far exceeds the rate

of reproduction. Bears are hunted mainly for gall bladders and hides, which are sold to dealers who come from big cities after each season, and either buy these products or exchange them for liquor.

Nikolaenko (1993) from Kamchatka presented data on not less than 1,500–2,000 bears eliminated annually in the oblast. The official quota in 1994 was about 600 bears, and the total population was estimated in 1990 as 9,000 individuals. However, Valentzev (pers. comm.) estimated that the poaching rate in one district was much lower if extrapolated to the area of Kamchatka, in which there is approximately one poached bear per bear legally taken.

At the same time, in 1994 there was evidence of a decrease in bear trade as well as poaching in the Far East. After three to four years of extensive market development, it became saturated and prices for bear bile and hides decreased (if calculated in hard currency). In 1992–1993 poachers sold bear bile for US\$5–8 per g, but now they can hardly get more than US\$2–3 per g. People's incomes also became higher, as did prices for food and other goods. According to the opinion of some respondents, it is not quite so popular to trade in bear parts as it was in 1991–1993 (Chestin *et al.* 1994). The development of bear farms for supplying bear bile to neighboring Asian markets may create a problem in the region. Until the end of 1994, one such farm had been reported on Sakhalin Island.

Habitat threats

There have been no studies on how particular kinds of development and habitat transformation affect brown bears. Thus the data are very scarce and come primarily from experts' estimations. Deforestation in order to promote crop agriculture was probably the main reason for diminishing brown bear range in the past (Geptner *et al.* 1967). At the same time, the negative impact of logging was observed only in the south of European Russia. In the northern oblasts (Vologda, Yaroslavl, and Kostroma) and Karelia, the density of brown bear populations even grew for some time after timber harvesting was done, as understories started to recover. Rukovskiy (1981) explained this with more diverse habitats which usually develop in partly harvested areas. However, the latter is true for forests with good reproduction rate and similar tree species composition in recovered stands. For example, in Siberia and the Far East, former Siberian pine forests are replaced by spruce. Siberian pine provide bears with nuts, which are crucial in autumn for accumulating fat for the denning period. In the Baikal region these nuts are almost an exclusive autumn food and cutting Siberian pine forests leads to starvation in the bear population.

Forest fires destroying bear habitats and causing population disaster due to starvation are mostly common in Altai Mountains and Central and Eastern Siberia. For

example, in three districts of Irkutsk oblast near Baikal Lake in 1984–1986 nearly 700,000km² of forest were burned (Ustinov 1993).

Grazing and cutting mountain forests is a serious problem for bear habitats primarily in the mountainous areas in the Caucasus (as well as in the Central Asian portion of the former USSR; this was one of the main causes of diminishing brown bear populations in Kopet-Dag, Tian-Shan, and Pamir). However, nearly all appropriate alpine meadows have already been developed for grazing, leading to a decrease in brown bear populations in the 20th century. Therefore, future deterioration due to grazing is not expected.

The following potential threats cannot be assessed because of lack of any data: 1) Oil and gas mining; 2) Tourism; 3) Road construction; 4) Irrigation.

Management

Until recently the state organization responsible for rational use and management of wildlife was Glavokhota RF (Chief Department of Game Industry, Council of Ministers, Russian Federation). In 1994, it was transformed to a Department of Game Industry of the Ministry of Agriculture and Provisions. This governmental organization maintains all control over the use and management of game species. At the same time there is a Department of Biological Resources, Ministry of Nature Protection and Natural Resources, which is responsible for the protection and control of all users of wildlife. Department of Game Industry has regional offices in every oblast, kray, and republic in Russia (Departments of Game and Trapping Industry) and those territorial divisions are governed both by federal Department and local administration. Every oblast, kray, and republic is divided into administrative districts. Each of the latter has one to three game managers, who perform the actual management and follow the guidance of local Departments in oblast (kray, republic) center. The main applicable functions of the Department of Game Industry and its local branches are:

1. Control of all users of game in order to ensure their proper use;
2. Setting up the quotas for harvesting all game animals for oblasts, krays, and republics (set by the federal office) in coordination with the Department of Biological Resources, Ministry of Nature Protection;
3. Determination of hunting seasons for all species and regions (set by the 'Hunting Rules in Russia' with slight annual corrections by local branches depending on phenology) in coordination with the Department of Biological Resources, Ministry of Nature Protection;
4. Issuing permission for elimination of game animals outside of hunting seasons (for nuisance animals, or

for scientific and cultural purposes; can be issued both by federal and local offices).

The following is a description of the most typical situations and ways in which they are managed:

- If a bear attacks a hunter and he shoots the animal, he should report the conflict to the local game manager. After an examination of the conflict site, the game manager and the hunter sign a document with a description of the situation and send it to the local branch of Glavokhota.
- If a bear attacks and seriously injures a person, the local game manager should contact the local branch of Glavokhota and ask for a permit (which differs from regular license for sport hunting) for elimination of a nuisance animal. Usually such permission is issued, and then the local game manager, with several volunteer hunters, tries to locate and shoot the animal. Of course, quite often they shoot not the particular nuisance bear but the first one they meet.

Similar procedures take place if bears start preying on livestock, damaging beehives, or entering settlements. Owners report to a local game manager who applies for a permit from the local game department to kill the animal.

According to Geptner *et al.* (1967) in the 1930s, 3,000–4,000 bear hides were annually purchased from hunters. Of course, many hides were kept by the hunters for their own needs. Geptner *et al.* (1967) believed that those accounted for up to 60% of the total. Using this percentage, about 4,600–6,400 bears were harvested annually. Since there were no special regulations, all bear hunting was legal. Filonov (1981) mentioned that in European Russia in 1935–1953, 1,896 bear hides were annually purchased. Up to 0.57 hides annually were coming per 100km² of habitat in Stavropol kray, and 0.51 per 100km² in Vologda oblast. Between 1954–1960, state procurement remained practically the same – 1,892 per year on average with maximum harvest density in Mariy Al (0.48 hides annually per 100km²) and Bashkortostan (0.33). However, between 1960–1971 the state procurement came down to 496 hides per year because more hides were being kept by the hunters and the harvest rate was likely lower. The maximum number of skins purchased from hunters in European Russia in one year was 2,733 in 1953.

In 1981 after the establishment of a system of prepaid licenses for bear hunting, and with the total population in Russia equaling about 80,000 bears, 4,200 licenses were sold. Only 1,400 bears actually were shot (1.75% of the population). In 1982, 5,000 licences were purchased by hunters, but only 1,900 bears (2.4%) were harvested (Sitzko 1983). The above figures do not include losses resulting from poaching. The annual harvest quota was set according to the demands of local Departments of Game, but not exceeding 10% of the population.

| Table 7.4. Number of brown bears (<i>Ursus arctos</i>) legally shot in 1989. | |
|---|--------------------------|
| Region | No. of bears shot |
| North (Arkhangelsk, Murmansk and Vologda oblast, Karelia and Komi) | 921 |
| Northwest (Leningrad, Novgorod and Pskov oblasts) | 241 |
| Central (Ivanovo, Kostroma, Smolensk, Tver and Yaroslavl oblasts) | 470 |
| Volga-Vyatskiy (Kirov and Nizniy Novgorod oblasts and Mariy Al) | 492 |
| Northern Caucasus (Krasnodar and Stavropol krays, Dagestan, Kabardino-Balkaria, Northern Osetia, Chechnya and Ingushetia) | 57 |
| Uralskiy (Chelyabinsk, Perm and Sverdlovsk oblasts, Bashkortostan, Udmurtia) | 409 |
| Western Siberia (Kemerovo, Novosibirsk, Omsk and Tomsk oblasts, Altai kray) | 261 |
| Eastern Siberia (Chita and Irkutsk oblasts, Krasnoyarsk kray, Buryatia and Tuva) | 527 |
| Far Eastern (Amur, Kamchatka, Magadan and Sakhalin oblasts, Primorskiy and Khabarovsk krays, Yakutia) | 1,576 |

Since the brown bear population was growing, the legal harvest of 1987–1988 reached 3,600 bears, slightly more than 50% of licenses sold (Gubar *et al.* 1992). Thus about 3% of the population was legally harvested. In 1989, 4,954 bears were legally shot; their distribution among the regions is shown in Table 7.4.

Together with losses from poaching, total harvest probably did not exceed 10% of the population. Assuming that hunting was successful about 50% of the time, and that further population growth in many areas was undesirable, the quota for annual harvest was recommended to be 15% on average and up to 25% in particular areas (Gubar *et al.* 1992). In 1992, 4,058 bears in Russia were legally shot, and for 1993–1994 there were about 9,000 licenses available.

Human-bear interactions

The main role of brown bears in people's life in Russia is as an object of game hunting. Livestock depredation by bears is much less of an issue, and is overshadowed by that by wolves. Occasionally, as was observed in 1961, 1962, and 1967 in the Baikal region, and in 1985 in the north of

the Russian Far East, bears experience a dramatic lack of autumn food sources and start preying on people. Crop depredation, despite being fairly common in oat fields, is not regarded as a serious problem. Damage to beehives in the areas with developed honey production is a problem, and in areas such as Bashkiria, most of the bears eliminated as nuisances were those which visited apiaries.

Public education needs

In fact, the general public in Russia are quite aware of bears and their habits. Legal bear hunting was traditionally regarded as a job for good, experienced hunters, and was treated with great respect. At the same time, poaching in the reserves, killing animals for their bile, or killing them for illegal sale has never been thought of as a good thing to do. Recently this has changed because the economic crisis has made many people dependent on poaching. Currently, it seems as though nobody cares about the source of supplementary incomes, except for those that involve crimes against humans. Arguments that bears and other wildlife can be used for future development of the region are not convincing, since people do not connect the well-being of a region with the well-being of individuals. Therefore it seems that the matter is not a problem of education, but of changing social conditions.

Another serious problem is that nearly all bear research programs are now stopped because of lack of funds. Before 1990–1991, both Universities and the Institutes of the Russian Academy of Sciences and Natural Reserves carried out extensive research which allowed them to monitor population trends in almost all regions. In fact, this review is based mainly on those data. Recent information on numbers and population densities is not available (except for expert estimations). National organizations demonstrate no interest in initiating any projects on bears. Some international organizations seem to be interested in bear protection, but their interest is concentrated more on practical measures, like developing management strategies. At the moment it is still possible to do this based on three or four year-old studies, but within a few years management practices will have no up-to-date scientific background. Also important is that many national bear biologists, having no funds for their research, switch to other activities which results in the loss of national professionals for future projects.

Specific conservation recommendations

The primary need seems to be a monitoring program to assess bear populations and trends, at least in the areas where bears are most vulnerable. One of such areas is the Russian Far East where recent growth in poaching

probably led to the most dramatic decrease in bear numbers. There are bear specialists in Chukotka, Kamchatka, and Magadan oblast who have no funds to accomplish this task. No bear specialists are available at the moment in the south of the Far East (Primorye and Khabarovsk krays) nor on the Kuril Islands and Sakhalin. Monitoring can be fulfilled by establishing a network of bear observers coordinated at the national or international level.

Secondly, there are remnant isolated brown bear populations in European Russia. Bear specialists exist in the region but no single field survey has been done on any of the isolated populations.

Monitoring programs can be achieved by establishing a network of bear observers who would be responsible for both monitoring population trends and running some urgent research projects. This network can be coordinated on a national or international level.

Probably the most difficult task is stopping poaching and the illegal trade in bear parts. Despite the signs of recently decreased trade in bear parts mentioned above, it still remains a problem. The problem can be solved by either improving wildlife controls to prevent poaching, or

enforcing customs control to prevent trade. If there is no international trade, there will be no commercial poaching because there is extremely little demand for bear parts within the country. Unfortunately one can hardly anticipate essential changes in either of these two systems because of the lack of governmental funds. Moreover, despite several wildlife protection laws existing in the country, legislation is extremely ineffective because of local corruption. In a recent survey, about 24% of respondents mentioned situations where poachers were investigated or dealers stopped at customs with wildlife products, but none of them was ever called to court (Chestin and Poyarkov in press).

Regarding the above, one way to combat the problem would be to establish an international foundation which can support control services, preferably in the form of bounties, for personnel who investigate poachers. Another option would be to develop management plans for various areas with developed bear game hunting. This would ensure that hunters would cover the expenses of control and census services. Such a plan is being developed now for Kamchatka by WWF.