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At Risk: Saving Japan's Bears as Forest Habitat Fragments／絶滅の危険―残存する森林生息体としての日本の熊を救うには

Winifred Bird

At Risk: Saving Japan's Bears as Forest Habitat Fragments

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In 1990 Maita Kazuhiko set out to capture some bears. Maita, who now directs the Institute for Asian Black Bear Research and Preservation in Hiroshima Prefecture, had first been drawn to the powerful animals as a college student in the 1960's. At that time he had little interest in conservation, and, simply wanting to study their behaviour, spent two decades after graduating tracking bears for a regional government office in northern Japan, where he was also in charge of handling complaints from local farmers suffering crop damage from the animals. By the 80's, however, it was clear that Japanese black bears (*Ursus thibetanus japonicus*) were in a state of crisis.

It wasn't that their forest habitat was disappearing altogether, as it had in many other parts of Asia: despite Japan's urban image, a surprising 67 percent of the country remains forested.[1] Nevertheless, bears were causing serious damage to crops and timber plantations throughout their range on Honshu, Japan's main island, and Shikoku, the smaller island that sits to the west of Osaka. While cases of injury and death were still rare, they were increasing.[2] As many as 2,500 black bears were being shot each year as "nuisance kills" and by sport hunters,[3] and some isolated populations were nearing extirpation. So Maita moved south, opened the Institute in 1989, and devoted himself to conservation work. What he discovered as he began studying the bears in Hiroshima's Chugoku Mountains surprised him.

"I set out a lot of traps in remote mountain areas, but I only caught two bears – and I'm a very good bear-catcher," says Maita, who had hoped to attach radio tracking devices to the bears' necks and then release them. "I was able to capture more around small villages. That's when I first realized there were almost no bears in the deep mountains of Hiroshima."

Maita had come face to face with the strange reality of contemporary Japan: although it is among the most heavily forested countries in the world,[4] much of it has become uninhabitable for bears and other wildlife. Sixty years of development and urbanization have reshuffled ancient patterns of land use and radically changed the composition of Japan's forests. Habitat for ordinarily shy mountain wildlife has shifted closer to villages, causing conflict with humans to increase.

A Japanese black bear in the mountains of

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Hiroshima Prefecture (photo by Maita Kazuhiko).

Black bears play an important ecological role as scavengers and occasional hunters. They are often also described as an indicator or umbrella species: because they require a large, diverse habitat, their presence is one sign of a healthy natural environment. Protecting them by default leads to protection for a wide range of plants and animals that fall under the bear's habitat "umbrella."

The International Union for Conservation of Nature's (IUCN) Red List states that Japan is the only country in Asia where the number of black bears could actually be increasing.[5] That may be the case in most of northern Honshu, but on Shikoku and in parts of central and southern Honshu they are endangered. Even the supposedly healthy populations may not be safe for long: in 2006, a stunning 4,340 of Japan's black bears were legally killed[6] because they were perceived to be a threat (the figure does not include those killed by sports hunters). No one knows how many black bears live in Japan, but Maita fears the 2006 kills may have represented up to sixty percent of the entire population.

These extraordinary numbers evidence not so much a national hatred for bears as a failure to plan for the inevitable consequences of development on a crowded island. Despite high rates of urbanization and a proclivity to manicure nature the Japanese are as fond of wildlife – or at least the idea of wildlife - as any other people, and numerous efforts to protect bears are underway around the country. Nevertheless, Japan lacks a comprehensive strategy for managing the bears, boars, and other creatures that development pushes out of the wild. In this vacuum of knowledge and planning, black bears lumber ever closer to extinction.

This crisis in the coexistence of humans and bears is a relatively recent phenomenon. For most of the history of civilization in Japan, the boundary between bear habitat and human habitat was clearly defined – and defended. Bears lived in what was called *okuyama*, the deep mountains where humans rarely ventured except to hunt and cut wood. While overharvesting of timber was a problem as early as the eighth century, by the 17th century a system of regulations had developed which averted the wholesale destruction of Japan's forests.[7] The result was that with the exception of some early silviculture the *okuyama* was covered largely in natural forest and was regarded with fearful respect as the abode of the gods. Rural population was concentrated in small farming villages. Between the two was a buffer zone of managed woodland called *satoyama*, where villagers collected firewood and cut weeds and grass to enrich their rice fields, and animals such as bears and the deer-like serow rarely strayed.

However, as anthropologist John Knight[8] and historian Brett Walker,[9] among others, have pointed out, crop damage from boars and deer has long been a problem in mountain villages; the ruins of stone walls built to protect fields that can still be seen in rural areas today offer a physical shadow of that history (the walls are called *shishigaki*, literally "deer barrier"). Nevertheless, many scholars agree that recent changes in the composition of the forest have intensified the problem and led to increased encounters with bears.

Since World War II rural depopulation has turned the *satoyama* wild in many places while the *okuyama* has become increasingly domesticated. As the demand for timber in the construction and industrial sectors skyrocketed the government subsidized large-scale planting of Japanese cedar[10] and Japanese cypress plantations.[11] At the peak of afforestation between 1960 and 1970, over 20,000 square kilometres of natural forest – an area larger than Connecticut - was cut to make room for timber trees.[12] Such plantations now make up

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41 percent of Japan's forests, and in some prefectures the figure is higher than 60 percent.[13] What natural forest remains has been fragmented by roads and other development.

The outcome, say critics like Moriyama Mariko of the 20,000-member Japan Bear and Forest Association (JBFA), has been the creation of forests where few animals can survive. Vast single-species stands of timber lack the plant diversity found in natural forests, and plant diversity forms the foundation for animal diversity. Black bears, for example, are omnivorous but prefer to eat young leaves, insects, berries, and acorns[14] - few of which can be found in timber plantations.

"The results of the experiment are in," says Moriyama, who founded JBFA after a career as a middle school science teacher. "Japan's traditional culture preserved amazing forests up till World War II. Our post-war approach has failed."

Mixed broadleaf forest (foreground) and coniferous plantation forest (middle ground) in Odai-cho, Mie Prefecture, one of the remaining refuges for bears on the Kii Peninsula.

That black bears survived at all into the twenty-first century is due largely to Japan's mountainous geography. Although Honshu and Shikoku don't have national parks on the scale of Yellowstone, some inaccessible mountain areas have remained wild. Japan's black bears have as a result fared better than many of their species in other Asian countries like Bangladesh, where bears cling to survival in small remnants of forest, and China, where demand for bear bile used in traditional Chinese medicine fuels dangerous levels of poaching.[15] They are categorized by the IUCN as vulnerable throughout Asia.

"Northern and eastern Japan are snowy and the mountains are high, so bears have had places to escape to and have been protected. In northern Japan their range is expanding, although we don't know whether the population is actually growing," says Yamazaki Koji, a council member of the IUCN Bear Specialist Group[16] and director of the Japan Bear Network, a national advocacy and education organization. Black bear population is falling, however, where winters are mild in the Chugoku and Kii Peninsula areas of western Honshu and on Shikoku. They are thought to have disappeared from Kyushu, the island west of Shikoku, by the 1940's (their range does not extend to Okinawa or to the large northern island of Hokkaido, which is inhabited by grizzlies).

The exact mechanism of the bears' decline has varied with location. In Mie Prefecture, on the Kii Peninsula, artificial plantations make up 62 percent of all forests[17] and as is the case nationwide, depressed lumber prices and rural depopulation have led to widespread neglect of these plantations. Tree seedlings in Japan are planted close together to shade out the fast-growing weeds that, thanks to a warm wet climate, would otherwise out-compete them. Later, foresters must repeatedly thin the stands. Insufficient thinning not only produces spindly trees, but leaves the forests dark and bare of undergrowth that could provide leaves, berries, and acorns for bears to eat. Still the

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bears enter these barren woods in search of sustenance.

"If you go into the remote plantations around May, the forest actually looks bright from where bears have stripped the bark off the trees and the white and red underside is showing," says Yoshizawa Hideyuki, a 42-year old forestry worker in Owase, Mie Prefecture. Yoshizawa has spent his spare time over the past ten years doing independent bear research under the tutelage of Hiroshima's Maita, and is the only active field researcher in the region. He says bears probably strip the bark to get at a sweet underlayer that develops in the spring; where the bark is peeled away, the trunk rots and the timber becomes unusable.

Yoshizawa Hideki, a forestry worker and bear enthusiast, points out bark stripped by a bear in a timber plantation near Owase, Mie Prefecture.

Until the early 1990's forest owners on the Kii Peninsula trapped and killed bears to reduce damage. The story was similar on Shikoku, where today less than 30 bears are thought to remain.[18] Now that they are listed as endangered in Mie's Red Data Book, bears are protected from hunting by a prefectural ordinance. That may do little to help the isolated Kii Peninsula population, however, which government estimates put at just 180 bears.[19]

In Hiroshima, says Maita, the depopulation of the countryside has played a greater role. Nationwide urbanization and a shift from agricultural to factory, office, and service industry work has greatly reduced population in rural areas over the past half century, leaving fewer people to maintain farms and fields. The percentage of people living in towns of less than 5,000 shrank from nearly 50% in 1920 to just 1.7% in 2000.[20] These small, aging towns on the edge of the forest are where much of today's conflict with bears is occurring.

"Before the 80's, there was a zone between the villages and the mountains where people cut grass and harvested firewood," explains Maita. "When people stopped managing those areas, the trees grew larger and bears and wild boars were able to live closer to the villages." Unharvested orchards of chestnuts and persimmons also drew bears close to houses, where frightened villagers usually shot or trapped them.

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Overgrown fields and abandoned houses, like this one in a village in Mie Prefecture where just two residents remain, are a common sight in rural areas.

"Bear management consisted of killing bears," says Maita. That is still the case in many areas where the animals are not officially endangered. Sport hunting of Asiatic black bears, which is legal only in Japan and Russia, is declining and now accounts for about 500 bear deaths each year[21] (killing bears for their gall bladder is also still permitted in Japan). Nuisance kills are a far greater threat and account for 1,000 to 2,000 deaths per year on average.[22] Many villagers see bears as pests, says Maita, or simply don't know what to do when a bear appears in their back yard. Although Japan's black bears kill humans only in extremely rare cases, many people have little knowledge of their behaviour. Standard practice until recently had been to call the local government, which would call a hunter and have the animal killed. Even in protected areas "problem bears" can still be dealt with in this way. And for local officials who, thanks to a 1999 change in wildlife management law, now have final say on how bears are handled, the perception that in some areas numbers are increasing only bolsters their image as a pest to be controlled.

Capture-and-release is gaining ground, however. In the 90's Maita developed a method for trapping "village" bears, anesthetizing them, and releasing them in more remote mountain areas. The bears, however, often returned.

"Japan is a small country. We can't release bears in the neighboring prefecture, or even the next town. In America, you can take bears 50 miles away and release them. Here, we're often letting them go five miles from where they were caught," he says. To prevent them from wandering straight back, he began spraying the bears with hot pepper solution so they would fear humans. That method is now official policy in some areas, and Maita says it has been used with some success in over 1,000 cases. But the Japan Bear and Forest Association's Moriyama and other conservationists - including Maita himself - argue that doesn't get to the root of the problem.

"We need to recreate a place that wild animals can return to," says Moriyama, who advocates returning all remote mountain areas to natural forest and limiting plantations to 30 percent of lowland areas. JBFA actively cuts down conifer plantations and re-plants them with the broadleaf species that bears favour, and has also preserved 3,128 acres of threatened old growth-like forest in trusts at nine locations (true old growth forest in Japan is extremely rare).

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Moriyama Mariko, founder of the Japan Bear and Forest Association, stands in a forest her organization hopes to preserve as a trust.

That may help restore Japan's natural forests, but the country's ravenous appetite for timber remains. "If we replaced our current plantation forests with acorn-bearing broadleaf trees that can barely be used for building houses, we'd have to import an even larger amount of wood from abroad. In the end we'd be trampling on the rights of the local people who depend on forests in those areas," says Hayami Tohru, who owns 2,009 acres of Forest Stewardship Council-certified Japanese cedar and cypress forest in Owase, Mie.

Japan already imports over 80 percent of the 100 million cubic meters of timber it consumes each year,[23] and an estimated 20 percent of that comes from illegally logged forests[24] (mostly in Indonesia, Malaysia, Russia, and China[25]). Rather than abandon its ailing timber industry, Hayami says Japan should manage its plantations so that wildlife can thrive in them.

"I think it's possible to preserve biodiversity while producing timber, and as a result provide habitat for many animals, including bears," he says. Thinning is key to that goal, since when enough sunlight reaches the forest floor, a variety of plants and animals can live between the trees. Hayami leaves about a fifth of the forest canopy open on his land and avoids cutting undergrowth. He's catalogued over 240 plant species there and many animals, including bears. Nevertheless, he admits that providing habitat for bears while running a productive timber operation is far from easy: his remote properties suffer heavy damage from bark-stripping each year.

Sustainably-operated forests like his remain rare in Japan,[26] but thinning may soon get a boost from the Democratic Party of Japan, which came to power in September 2009.

"I think it's important to create healthy plantations through thinning, and by repeating that process to move towards diverse forests. With the new regime we've taken a big step in that direction," said Kajiyama Hisashi in an email interview. Kajiyama is a specialist in environmental studies and forestry. In November he was appointed to the National Policy Unit established by Prime Minister Hatoyama Yukio.

According to the DPJ's Index 2009, the party's forestry-related policy goals include raising timber self-sufficiency to fifty percent; directly subsidizing thinning operations; improving the forestry road network and introducing high-performance machinery to the industry; implementing a traceability system to regulate the import of illegally harvested wood; and creating a new unified law regarding forests, rivers, and coastal areas which is written from an environmental perspective focussing on healthy watersheds.[27] The Forestry Agency has

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established a ten-year plan to move towards a number of these goals.

Spokespeople at World Wide Fund for Nature Japan (WWF) say they have not yet noticed any real changes in wildlife management or timber import regulations since the DPJ came to power, although that may be partly due to the fact that the new fiscal year has not yet begun, hence last year's programs are still in place. The group is lobbying for stronger regulation of the international timber trade and more protection for wild animals.

When and if the DPJ's forestry policies are implemented, however, the impact they will have on bears and other wildlife is unclear. While increased thinning may contribute to a more diverse forest understory, if the timber industry does in fact experience a renaissance, pressure to kill bears in order to reduce timber damage could rise. More roads, too, could further fragment forest habitat.

The Index does outline a specific policy regarding bears, but while this begins with a statement that human injury and crop damage is increasing, it does not mention that bears are being culled to the point of extinction in some areas. DPJ policy will be based, it states, on habitat management, revitalization of mountain areas, and preventing damage to people and crops, while at the same time restoring ecosystems as much as possible. Practical measures will include undertaking ongoing studies to appropriately manage bear populations, preventing unnecessary encounters with bears, and promoting the use of bear dogs to chase away bears.[28]

In general, says WWF Japan's Okura Hisashi, the government has over the past several years slowly begun putting more emphasis on biodiversity conservation. According to Okura, some regional governments have started giving more protection to bears: In response to studies that showed the animals were straying outside current preserves on Shikoku, one prefecture recently approved new protected areas and another may follow soon.

Unfortunately, much of the damage from development and loss of natural forest has already been done, so creating large, unbroken nature preserves will likely be impossible. Japan must instead invent ways to protect wildlife even where wilderness is closely intertwined with developed areas. To do that, the Japan Bear Network's Yamazaki says improved research and education are needed.

"First we need to thoroughly study the current state of Japan's black bears, especially the actual population size. Based on that, local communities need to discuss how to zone the areas where bears will live and those where humans will live ten or twenty years down the road, and plan accordingly," he says.

In short, Japan will once again need to redraw its relationship to the natural world. That won't be easy in a nation that is now overwhelmingly urban and out of touch with nature, but it may be the only way to ensure a future for Japan's black bears.

Winifred Bird is a freelance journalist who writes about the environment from her home in Mie, Japan. This is a revised and expanded version of an article written for Yale Environment 360.

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Notes

[1] Japan Forestry Agency online statistics (in Japanese).

[2] Nationwide statistics are not available for bear-related injuries and deaths prior to the

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1980's, when the Ministry of the Environment was created. However Yamazaki Koji (director of Japan Bear Network and council member of IUCN bear specialist group) confirms that bear-human conflict increased during the 80's.

[3] Oi Toru and Yamazaki Koji (eds), "The Status of Asiatic Black Bears in Japan," in Japan Bear Network, *Understanding Asian Bears to Secure their Future* (Ibaraki: Japan Bear Network, 2006), 126. Also interview with Maita Kazuhiko.

[4] FAO, *State of the World's Forests 2001*. Link.

[5] IUCN Red Book of Threatened Species (online), "Ursus Thibetanus."

[6] Email from Maita Kazuhiko. Maita estimates an additional 800 were probably trapped in wire snares used to hunt boar and killed but not reported. Also see Justin McCurry, "Japan's black bears 'face extinction,'" The Guardian, Jan. 8, 2007 and statistics from the environment ministry (in Japanese) here. National figures for bears killed by sports hunters are not collected by the Ministry of the Environment.

[7] Conrad Totman, "The Green Archipelago: Forestry in Pre-Industrial Japan" (Athens: Ohio University Press, 1998).

[8] Knight writes that

> [P]erhaps the main danger posed by the forest to the village was wild animals. Wolves were an obvious threat to human life, but even more insistent was the threat from crop-raiding forest animals which could destroy village livelihoods. Villages have long tried to defend themselves from wild boar and deer through a wide range of measures, including the use of protective charms, physical fortifications, human patrols of the village perimeter, all-night vigils beside the rice-fields and pre-emptive, large-scale hunting (even on occasion total elimination) of wild animal populations. . . it is reported that when a deer suddenly appeared in a local village, villagers immediately gathered hoes and other sticks, surrounded the animal and beat it to death (Ue 1983:248)."

(Knight, J. 1997. A tale of two forests: Reforestation discourse in Japan. *Journal of the Royal Anthropological Institute* 3:711).

[9] See Walker's fascinating account of the cataclysmic faceoff between boars and villagers that occurred in 1749 in northern Honshu, as farmers attempted to expand their fields into what had been wild boar habitat (Walker, B. 2001a. Commercial Growth and Environmental Change in Early Modern Japan: Hachinohe's Wild Boar Famine of 1749. *The Journal of Asian Studies* 60:329-351).

[10] Although these trees are commonly called Japanese cedar they're actually not true cedars (they are Cryptomeria japonica).

[11] Akao Ken-ichi, "Private Forestry," in Iwai Yoshiya, *Forestry and the Forest Industry in Japan* (Vancouver: UBC Press, 2002), 35.

[12] Akao in Iwai, Forestry, 30.

[13] Japan Forestry Agency online statistics (in Japanese).

[14] Oi and Yamazaki in *Understanding Asian Bears*, 123

[15] IUCN Red Book of Threatened Species

[16] International Association for Bear Research and Management, IUCN/ SSC Bear Specialist

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Group. Link.

[17] Japan Forestry Agency online statistics, http://www.rinya.maff.go.jp/toukei/genkyou/shinrin-jinkou.htm,

[18] Akira Higuchi, "Shikoku's bears few, far between," Japan Times, April 21, 2009. WWF Japan says less than 20.

[19] Mie Prefecture Red Data Book, 2005 (in Japanese). The number, according to the prefectural government spokesperson, is based on speculation rather than data. Yoshizawa says it is probably an over-estimate.

[20] Japan Statistical Yearbook 2003, p. 36.

[21] Hazumi Toshihiro in *Understanding Asian Bears*, 126.

[22] Ibid.

[23] Conrad Totman, *History of Japan*, 2nd ed. (Oxford: Blackwell Publishing, 2005), 616. Figure is for 2000. Also see Stephen Hesse, "World's forests cut to feed voracious Japanese industry," Japan Times, March 27 2,000.

[24] Email from Maezawa Eishi, Forest Program Leader at World Wide Fund for Nature Japan and interview with Hayami Tohru.

[25] Email from James Hewitt, contributor to globaltimber.org.uk and independent business consultant assessing markets and trade of wood-based products.

[26] Interview with Iwai Yoshiya, ed. *Forestry and the Forest Industry in Japan*. As of June 2009 there were 27 FSC certified forests in Japan and 82 forests certified by a separate, Japan-only certifying body called the Sustainable Green Ecosystem Council.

[27] Democratic Party of Japan website, Index 2009 (in Japanese only).

[28] DPJ website, Index 2009 (in Japanese). The text regarding bears is as follows: クマ被害対策
近年、クマの異常出没が急増し、それに伴う人的被害や農作物被害などが 深刻化しています。かつてヒトとクマが共生し得た時代が存在した事実を想起し 、(1)生息地管理(2)中山間地域の活性化(3)被害防除を3本柱として、ヒトの安全 確保と農作物被害等の防止のための措置を確実に講じながら、可能な限りの生態 系の再生・回復に取り組み、クマ被害の抜本的解決を目指します。具体的には、 個体の適正管理のための継続的かつ科学的調査・研究の実施、クマ遭遇の未然回 避、クマの追い払いなどに効果が期待できるベアドッグの導入などを進めます。

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