

for agriculture. The first problem is external, and the second local, and each contains a very delicate or difficult problem.

Another problem is a possibility in the future. Clinical studies have been carried out in cooperation with a veterinarian on the hematological, microbiological, and parasitological examination of Iriomote cats and feral cats on the island. We have not found a severe disease problem, at present, but one could develop in the future. However, I do not think the Iriomote cat has hybridized much with the feral cat. I sometimes find other carnivorous mammals in my study area and have made observations of feeding sites, seen some tracks, and taken some photos by phototraps, but I have never found a feral cat there. So, I think its only a possibility for the time being.

A major problem has been a lack of understanding by the local people. However, the situation is getting better. Many people on the island are now proud of this cat. There has not been any killing of the cats, loss of environment, or feeding problems since 1979. Chickens had been provided at about 10 sites since 1979 by the government. I do not know the results of this program, but, after a three-year study, we asked the environmental agency to modify the program. The supplemental feeding was then stopped. A full explanation would take a long time, and so I will mention only two points. First, the artificial feeding sites have a big influence on the behavior of the cats. Second, the cats are encouraged to kill poultry. In our study, we did not provide food. We were mostly monitoring the condition of the cats by observation and phototraps at the supplementary feeding sites.

Traffic accidents are another problem. Some cats are killed in this way every year. All we can do is to appeal to drivers to beware of animals by placing signs deflector stickers on the roadsides.

Finally, I think the Iriomote cat has a chance and can survive on Iriomote island. But we must protect the forest system of Iriomote island to protect this cat. To do this, we need help.

Joslin: The Iriomote cat is in a very vulnerable position. There is none in captivity. I want to emphasize the need to create a captive breeding project. Otherwise, this species could very easily disappear.

Lynx *Lynx lynx* in France and Switzerland

Veronique Herrenschildt

The lynx research program began in 1983 in the Vosges Mountains. We have released 14 lynx in the Vosges in three releases since 1983, and six are alive today. There have been two cases of breeding, but, unfortunately, the young did not survive. One of the mothers was killed by humans, resulting in the death of her young cubs, and the young of the other one got rabies. I hope that there will be good reproduction in 1989. Six more cats are to be released next winter.

We have been studying dispersal, the establishment of home range, and the needs of lynx released in an environment that is free from other cats. The second objective of the study, the impact of lynx, is being looked at from the point of view of the sex ratio, age ratio, and physical condition of the prey killed by the lynx. The biggest problem that confronted us in this release operation was the release of information. This was the first time big cats had been officially released in France. We thought that the information given before the release was enough, but it was not true. And this error threatened to bring down the entire project. Information has much more effect when you explain how the lynx will be released and what is their expected impact. The information should be based on scientific surveys. In France, this operation has shown that it was most important to influence children, who could talk to their parents. You can do that through books and pictures. And then also, there is a need to influence local

politicians. This is very important because local people keep sheep, and the politicians can easily stop any information about the project, if they are ill-informed.

Lynx reintroduced into Switzerland since 1974 have colonized France in the area of the Jura Mountains and the northern Alps. In the Jura, this colonization has now resulted in a problem. Sheep predation has continually risen. Ten sheep were killed the first year, 30 the second year, and then, in 1988, nearly 150 sheep were killed. We expect 400 sheep to be killed in 1989. The sheep owners are compensated by the government, and the Ministry of the Environment is trying to find a solution to this problem. But it is quite hard to convince sheep owners to put protection collars on their sheep; they are very resistant. The sheep owners have no authority to shoot or trap the lynxes that attack their sheep. They are not told how to discourage or capture the lynx that are killing the sheep, and we are not killing the lynx that kill sheep. It is a big problem, and we have to solve it. I think that it could become more and more dangerous in terms of a general reintroduction of lynx in Europe. There are other carnivores, including dogs, in the area, and I am not sure that only lynx are killing the sheep.

Jackson: Obviously there is a very serious problem. Veronique said 400 sheep might be killed this year and I could well sympathize with the sheep owners. However, they should take precautions.

Lynx in Switzerland

Urs Breitenmoser

We are radio-tracking on the Swiss side of the border with France, where we have not had problems of lynx killing sheep. But there have been some problems in the Alps. Recently we made a video film to educate Swiss game wardens on how to distinguish between kills by lynx, dogs and red fox.

The problem I would like to focus on is that of reintroduction of lynx in the Alps. I am sure that we shall have uneven breeding problems, because only a few lynx were released. We do not know if the lynx, which were captured in the wild in the Carpathian Mountains, are very closely related to each other or not. Unfortunately, I do not think further releases will be possible in Switzerland in the coming years for political reasons.

The ideal thing would be to build one big Alpine lynx population with cooperation between Austria, France, Germany, Italy and Switzerland, and even Romania. I hope the Cat Specialist Group can help.

Spanish Lynx *Lynx pardina*

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This species is restricted in distribution to the southwest of the Iberian peninsula. Our main research has been in the Doñana National Park. This area is flat and low, and is located on the right bank of the Guadalquivir River in southwestern Spain. The first systematic survey was made by Dr. Miguel Delibes on the lynx's food habits in 1973-1976. Ten years later, in 1983, we began a more complex, longterm program. We used radio-telemetry surveys during which I marked 12 animals. I finished my doctoral thesis in 1988 on food habits, space use, activity patterns, and mortality. The research has continued on some of these animals. Aldama finished his field work in 1988. He continued my work and completed the ecology study. Between us we marked about 25 individuals. Another thesis has been published, mainly on the special problems of this population in relation to all the populations in the Iberian peninsula. Also, research on the contacts, the relationships between sub-populations began in 1988. We esti-

mate the size of the population in the Doñana National Park to be about 50 individuals, in an isolated population.

We have also just finished another study of the lynx in all of Spain, and shall probably publish the results next year. I can say that the species is decreasing. Some populations, which existed in the south of this area in the 1960s, have now disappeared. It is possible that other populations will also disappear in the next 20 years. Another research plan is an attempt to increase the number of lynx living in another protected area, because we estimate the number of lynxes living here at only around 20-25 individuals with problems in the sex ratio and high mortality. To conclude my observations, I can only say that we believe there is still time to avoid the extinction of the species. But we must decide priorities for the use of funds that we obtain.

Jackson: The problem, of course, around the Doñana is that there is a lot of tourist development and roads. Now the rabbit population, which had been depleted by myxomatosis has recovered to some extent, and there is a lot of rabbit trapping. Unfortunately, lynx get caught in the traps, and in many cases are injured and ultimately die.

Rusty-spotted Cat *Felis rubiginosa*

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A study of the rusty-spotted cat in the Dang Forest in Gujarat State in India, was started recently. The problem with this cat is that it has been reported to have such a strange distribution. It is normally found in the south, but, recently, it was reported from Kashmir, which is in the northern mountains. There are also reports from the northeast of India, which has a completely different habitat. There is not much known about the cat, although there is a subspecies in Sri Lanka that is not so rare as the Indian one. There are some captive specimens of the Sri Lankan subspecies in the Frankfurt Zoo.

I have my first wild photos of the Indian subspecies, which so far has been known only from skins. One problem is that it is a very small, nocturnal, arboreal cat, living in dense forests. It is very difficult to find. We are looking at phototrapping, or even live trapping, because the area is inhabited only by trappers. We surveyed about 45 villages and found that people hunt and eat it. The good news is that it does not seem to be that rare, because almost every single village reported having seen the cat. They were eager to shoot it for us. I tried hard to convince them that that was not what I wanted. They all described the habitat as rocky areas and hill slopes, not forest edges, as was earlier thought. It seems to be true, because everything that the villagers said proves that it lives in rocky areas and is found in the mountains. They could not be talking about two separate cats. Nothing is known about feeding habits or behavior. Our studies are continuing.

South American Cats and the Florida Panther *Felis concolor coryi*

John F. Eisenberg

An extensive analysis of the distribution of cats in Venezuela has led us to the conclusion that the margay and the little spotted cat, *Felis wiedii* and *Felis tigrina*, are the most specialized in terms of their preferred habitat type, and where they co-occur with the ocelot *Felis pardalis*, they are usually at a very low density. So it would seem that these two smaller cats have, over their range, a low density relative to ocelot.

As far as the Andean Mountain cat, *Felis jacobita*, is concerned, the range extends from Peru through Bolivia, Argentina, and Chile. It is confined to the Andes, apparently above 2,000 m. The only thing I can add to this is that there is persistent illegal

taking of skins that are not of exactly known origin. In other words, we know they came out of pockets in certain states, but the locations cannot be pinpointed. The good news is that, about 18 months ago, a young Argentinian scientist was able to photograph one in the wild. I understand that plans are afoot in Argentina to try to do a study of this elusive cat. It is a logistic problem to get up to that altitude, supply a camp, and carry out and execute a radio-telemetric study. But there are high hopes that this may be accomplished in the not too distant future by the Argentinians.

On the Florida panther situation, a lot has happened in four years. Most of the studies over the last 12 years have been concentrated in Big Cypress National Preserve. They have been extended now to Everglades National Park. The original estimates for the number of Florida panthers were based on the actual study areas. I am happy to report that there are more Florida panthers than previous estimates because work has begun on private lands to the north, and substantial reports show that at least some of the population gets into the St. John's river that drains north. Habitat is altered, not only by riverine forest, but by large extensive cattle ranches. Most of you probably do not know now, but Florida is a major beef producer. Cattle ranching in those pine scrub lands is not intrusive and the panthers do not seem to ascertain the cattle's role as a prey base. The panther does take white-tailed deer. Of 64 radio-collared deer, there was predation at a level of about 15%, which is about right.

We have a large National Park in the north, Osceola National Forest, that articulates with the Okefenokee Reserve. In an attempt to access the possibility of reintroduction of southern panthers into this rather crowded, restricted habitat, with urban development on both sides, six puma were brought from Texas, collared and released, and their fates observed. They were released in a wilderness area and several conclusions resulted. A determined group of hunters did not appreciate the reintroduction of panthers into that habitat. Since the cats were radio-collared, and one of the hunters had a certain amount of technological expertise, two cats were tracked down and killed before the hunters were pressured to cease and desist by offering a \$10,000 reward for information leading to their arrest. The other four panthers did quite well. Two of them actually gained weight. This proves one thing: that you can move them into an area and they will adapt. Pretty conclusively, the interstate highways are a barrier. They did not try to cross them, except for one individual that succeeded, but then went back. At the conclusion of this 14-month study by the Florida Game and Freshwater Fish Commission, one panther had not stabilized a home range and managed to wander into the suburbs of Jacksonville, where the urban dwellings back right into a large live oak swamp. There it was, about 30 feet up in a live oak, much to the dismay of the neighbors: it was successfully immobilized and retrieved, but this points up some of the hazards of the reintroduction process. There are going to be problems, with opposition from hunters and suburban dwellers that are uncomfortable with large cats watching their children play in the backyard. One Georgia farmer lost a goat about every other week, but was satisfied with the compensation and did not kick up a fuss over the experiment.

Population Viability Analysis

Ulysses S. Seal

We all know that, in the course of attempting to resolve problems in the conservation of endangered species, there are frequently striking differences of opinion about what needs to be done and how it needs to be done. These differences of opinion can be, and are being used as an excuse for not doing anything, or for carrying