What Shape for a Tiger Reserve?

The size and even the shape of a reserve may be vitally important in protecting a large endangered species such as the tiger, and a major part of the tiger research in Nepal, in the Royal Chitwan National Park, is concerned with finding out about the dispersal behaviour of young tigers so that their needs can be assessed. In a paper to the Tiger Symposium held in New Delhi in February, Hemanta Mishra and James L.D. Smith pointed out how important it is, in planning tiger reserves, to create conditions that will allow tigers to disperse, because this is the only way that a small remnant population (to which the tigers are now reduced) can maintain the genetic diversity that is vital for long-term survival. And of course tigers that wander outside the reserves attack the villagers' cows and buffaloes, and poisoning may be their fate. What is the minimum area needed to hold enough breeding tigers to maintain a genetically sound unit? How does the shape of reserves affect them — e.g. do long narrow parks with bottlenecks or topographical barriers prevent dispersal where a circular or rectangular shape would make it easy? To answer such questions the research team is fitting young tigers with radio collars and their movements are then followed from a plane. Tigers move long distances: of one litter of three, which dispersed when they were 22 months old, one male was first found 35km to the west, after which he went on outside the park and killed or wounded ten cows or buffaloes and then moved to the park's east boundary, 54km from the start; another male went 26km west, doubled back to the east, and then was found 16km from the start, and the female of the litter crossed the park on the east-west axis seven times, covering an average distance of 15.7km each time.

What Chance have the Rhinos?

In Sumatra all parts of the rhino are used and all fetch high prices, reports Markus Borner, who spent three years on a field study of the Sumatran rhino. So the incentives to poach are very strong, and the ruthless illegal hunting is probably as important a reason for this rhino's decline as loss of habitat. Most of the horn is sold to Chinese, both inside and outside Sumatra, who value it as an aphrodisiac and a fever-reducing medicine. Sumatran people use small pieces as amulets, often mounted on a silver ring; this, it is believed, makes the wearer immune to the evil powers of the black magic that is practised throughout the island, protects him against poisoned food and drink by causing the dish or cup to break, and can extract the venom from a snake-bite. Dried rhino meat is used as a medicine for leprosy, tuberculosis and diarrhoea, and people treat skin diseases with 'rhino oil', made by keeping a rhino skull for some weeks in coconut oil along with other magic ingredients, such as serow horns and strangely formed plants. Rhino shoulder blades are used to make cigarette holders, believed to have magical powers, and the dung is dried, fried in coconut oil or boiled in water and used as medicine. The hunters use three kinds of trap for rhino, the most harmful to the population being the one that drives a spear deep into the rhino's back, because, not only does it very rarely kill the

rhino immediately, but local hunters admitted that more than half the speared rhinos were never found. Dr Borner himself found evidence of one rhino that had tried to rub the spear off its back on surrounding trees and must have run several kilometres before it died of internal injuries. We hope to publish extracts from Dr Borner's report in the next issue of *Oryx*.

Another Bounty That Failed

Bounties (the payment of a fixed sum for every animal killed) have long been discredited as a means of controlling predators, and the story of the puma (cougar or mountain lion) in California is a good example. Pumas were a 'bountied predator' until 1969, when licensed hunting was substituted. But after two years this was stopped by public demand, and since 1973 pumas have been protected. How many pumas were left by then to protect? Dr Carl B. Koford, who has investigated in the field and has also studied the records collected by the California Fish and Game Department, estimates that there were still some 600 resident pumas in the state in addition to what he calls 'floaters' (animals on the move seeking territories). How, he asks, in an article in *Carnivore* **1**,1, did pumas survive half a century of bountied killing? The answer he believes is that the kills consisted largely of kittens and floaters and not the basic breeding stock; any lost residents were probably replaced by floaters from nearby regions. (It also suggests that cats are a lot cleverer than hunters and how inefficient bounties are.) The usual justification for bounties is that the predator kills farm stock, but, says Dr Koford, while 100,000 cattle and 75,000 sheep graze on the national forests in California, losses to pumas average only about a dozen a year, and of all the sheep taken by predators in California only about 1.2 per cent are taken by pumas (compared with over 14 per cent by dogs and more by coyotes). Which all shows how senseless the original bounty system was.

How Harmless is the 'New' Energy?

Harnessing energy from the sun, wind, waves or the earth's interior may be the 'natural' alternative to oil, coal and uranium, but the environmental repercussions would not necessarily be any more benign. In Britain the Department of Energy is funding a project to build reefs of wave-energy converters along the shores of the Outer Hebrides. A *New Scientist* article points out that this will considerably reduce the size of waves reaching the shore, in effect creating a lagoon hundreds of kilometres long, with an enormous impact on the ecology of islands that are rich in marine, bird and plant life — a prospect at least as worrying as the oil spills now plaguing Sullom Voe in the nearby Shetlands. In the US, officials at Yellowstone National Park are alarmed by proposals to extract geothermal energy in an area just outside the park boundaries; this, they say, might draw off the source of Old Faithful and the other famous Yellowstone geysers and change the character of the park, with unpredictable effects on its wildlife (not to mention the consequences of putting