

## **Population Collapses.pdf**

### **Some population collapses of biological resources arising from human predation**

The number of species which are known to have been driven to extinction as a result of targeted human action is relatively small. A much larger number have a high probability of becoming extinct in the medium- to long-term future. Several examples are well known. While blue whales (and several other whale species) and African elephants are not extinct, there have been fears that they could easily become so. These fears are justified not only because present numbers are small, but also because several of the conditions favouring extinction (and listed earlier) seem to be present in these cases.

Populations of large mammals are particularly vulnerable. Unlike most fish species, the biotic growth potential of large mammals is sufficiently low to mean that heavy harvesting can drive the stock to zero. A well-known example is the American plains buffalo, which has survived only through a combination of good fortune and carefully nurturing of small numbers of the animals in some safe havens. Indeed, hunting and trapping have left many land creatures perilously close to or beyond the point of extinction.

African elephants have for long been regarded as common property resources. In recent decades, elephant stocks have fared quite differently from place to place, depending on how governments and local communities have managed stocks, arranged economic incentives and controlled access. Several southern African states (such as Zimbabwe, Botswana and South Africa) manage the stocks as capital assets, strictly limiting access and allowing limited high-income-generating hunting. The most successful conservation programmes seem to have taken place where local people have had strong financial incentives for participating in these programmes, and so support strong anti-poaching measures. Kenya has experienced serious falls in its elephant population, not having established strong economic incentives for local people to participate in elephant protection.

Two large Asian countries - China and India - are threatened with substantial losses of species in the near future. Threatened species in China include a number of large mammals, including the giant panda, tiger, snow leopard, white-lip deer and golden monkey (see WR, 1994, page 79). The main influences appear to be general habitat change arising from population growth and the associated pressures for increasing food output. Other contributory factors are hunting, and collection of specimens for taxidermy and for preparation of medicines (particularly in the case of plants). Similarly, many large mammal populations are threatened in India, including the tiger, elephant and some apes.

Both China and India have recognised these threats for at least two decades, have instituted systems of protected areas, and have plans to increase the protected land area by large quantities over the next two decades. These schemes show many interesting qualities; for example, Chinese plans include attempts to create corridors, providing natural links between nature reserves within the country and to reserves outside China.<sup>1</sup> However, the limited success to date of these protected areas in attaining conservation objectives demonstrates the importance of providing appropriate economic incentives to local populations. In India, for example, local tribes people displaced from land devoted to tiger reserves have no incentive to conserve the animal, and their poaching has added to the pressures on tiger numbers (WR, 1994, page 99). As we remarked earlier, the designation of protected status is of little use in itself unless there are concomitant changes in human behaviour; these can only be expected if local people are granted secure land tenure, property rights are firmly established, and the enforcement of those rights is supported by the state.

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<sup>1</sup> Similar proposals to construct corridors have been mooted for the former socialist countries of Central and Eastern Europe. Previous no-go areas along national boundaries offer the prospects of providing, at little real cost, very ecologically diverse nature reserves connected to one another by ecological corridors following the national boundaries.

This brings us back to the question of open access. Blue whale stocks have suffered from open access, together with very slow rates of natural growth. Efforts by the International Whaling Commission to conserve blue whale stocks have been largely ineffective. The passenger pigeon, which effectively became extinct through hunting in the late-nineteenth century, also shows the dangers of extinction associated with open access.

While hunting or harvesting has been a major cause of extinction (or threats to extinction) of many large animal species, there are strong grounds for believing that most cases of species extinction do not result directly from excessive harvesting of the resource. Indeed, very often, species becoming extinct were never harvested at all. Most species extinction results from habitat change. Habitats do evolve naturally, of course, and so extinction is not only the result of human activity. But economic activity imposes very rapid and substantial changes to environmental systems, and it is this that is the cause of most species loss.

The important point that emerges from this is the potential for irreversible effects of resource use. This characteristic of irreversibility suggests that there may be benefits from cautious or conservative use of resources, especially when there is uncertainty about the role and functions of species that might be lost by development.