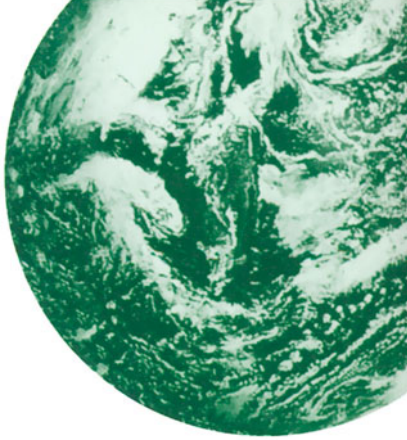

Chapter 8

Loss of biological diversity

M. K. Tolba, *Saving Our Planet*

The Earth's genes, species and ecosystems are the product of hundreds of millions of years of evolution, and have enabled our species to prosper. But the available evidence indicates that human activities are leading to the loss of the planet's biological diversity (or biodiversity). With the projected growth in both human population and economic activity, the rate of loss of biodiversity is far more likely to increase than stabilize.

No one knows the number of species on Earth, even to the nearest order of magnitude. Estimates vary from 5 to 80 million species or more, but the figure is most probably in the range of 30 million. Only about 1.4 million of these have been even briefly described. Of these about 750 000 are insects, 41 000 are vertebrates and 250 000 are plants; the remainder consists of a complex array of invertebrates, fungi, algae and other micro-organisms (1, 2).

Like other natural resources, the distribution of living species in the world is not uniform. Species richness increases from the poles to the equator. Freshwater insects, for example, are three to six times more abundant in tropical areas than in temperate zones. Tropical regions have also the highest richness of mammal species per unit area, and vascular plant species diversity is much richer at lower latitudes (3). Between 40 and 100 species of trees may occur on one hectare of tropical rain forest in Latin America, compared to only 10 to 30 on a hectare of forest in eastern North America. About 700 species of trees have been identified in one area of about 15 hectares of rain forest in Borneo—as many as in all of North America. A region in lowland Malaysia near Kuala Lumpur has some 570 plant species greater than 2 cm in diameter per hectare (4). By comparison, the whole of Denmark possesses less than twice as many species—of all sizes—as there are in one hectare in Malaysia. Global patterns of species diversity in the marine environment resemble those on land. The number of tunicate (sea squirt) species increases from 103 in the Arctic to some 629 in the tropics. These terrestrial and marine patterns of increasing diversity in the tropics reach their peak in tropical forests and coral reefs.

Tropical forests are not, however, the only highly diverse ecosystems. Regions with a Mediterranean climate also have very rich flora, with high levels of endemism. For example, of the 23 200 species of plants estimated to occur in South Africa, Lesotho, Swaziland, Namibia and Botswana (which are temperate areas), 18 560 (80 per cent) are endemic to the region (5). This gives the area the highest species richness in the world, 1.7 times greater than that of Brazil. Some 30 per cent of California's 5046 plant species and