Box 1.4 Pollination

To many people, bees are known simply as prodigious honey makers and bats as cohorts of vampires and darkness. Rarely do we recognize that thousands of species of plants could not reproduce without their help. Wind pollinates some plants, but 90 percent of all flowering plants—including the great majority of the world's food crops—would not exist without animals and insects transporting pollen from one plant to another. Of the world's 100 most important crops, bees alone pollinate more than 70 percent (Nabhan and Buchmann 1997:136, 138). Besides food, pollinators help produce other agricultural products that enhance our lives, including dyes, fuelwood, tropical timbers, and textile fibers such as cotton and flax. The diets of many birds and mammals also are based on seeds and fruits produced by pollination.

No wonder, then, that agricultural specialists consider the current worldwide decline in pollinators a cause for alarm. Losses of pollinators have been reported on every continent except Antarctica. Some are on the verge of extinction; pesticides, mites, invasive species, and habitat loss and fragmentation are major killers. The consequences of continued pollinator declines could include billions of dollars in reduced harvests, cascades of plant and animal extinctions, and a less stable food supply.

Few studies have calculated the economic contribution of all pollinators, globally, to agricultural production and biodiversity, but

- The FAO recently estimated the 1995 contribution from pollination to the worldwide production of just 30 of the major fruit, vegetable, and tree crops (not including pasture or animal feeds) to be in the range of $54 billion (international dollars) per year (Kenmore and Krell 1998).

- Estimates of the value of pollination just for crop systems in the United States range from US$20 to $40 billion (Kearns et al. 1998:84).

Dependence of Selected U.S. Crops on Honey Bee Pollination

Crops	1998 Quantity Produced (metric tons)	Percentage of Crop Loss Without Honey Bee Pollination*
Temperate Fruits		
Almonds	393,000	90
Apples	5,165,000	80
Cherries	190,000	60
Oranges	12,401,000	30
Pears	866,500	50
Strawberries	765,900	30
Vegetables and Seeds		
Asparagus	92,800	90
Cabbage	2,108,200	90
Carrots	2,201,000	60
Cottonseed	7,897,000	30
Sunflowers	2,392,000	80
Watermelons	1,673,000	40

*Crop losses are estimates of loss if managed honey bee populations were eliminated in the United States, with no replacement of their services by alternative pollinators.
Sources: FAO 2000; Southwick and Southwick 1992.

Pollinators for the World's Flowering Plants (Angiosperms)

Pollinators	Estimated Number of Plant Species Pollinated	Total Percentage of Plant Species Pollinated*
Wind	20,000	8.30
Water	150	0.63
Bees	40,000	16.60
Hymenoptera	43,295	18.00
Butterflies/Moths	19,310	8.00
Flies	14,126	5.90
Beetles	211,935	88.30
Thrips	500	0.21
Birds	923	0.40
Bats	165	0.07
All Mammals	298	0.10
All Vertebrates	1,221	0.51
	351,923	

*Total percentage does not equal 100, reflecting pollination by more than one pollinator.
Source: Buchmann and Nabhan 1996:274.