

Biodiversity is a Basic Economic Resource

BIODIVERSITY SUPPORTS PENNSYLVANIA'S ECONOMY

Biodiversity directly contributes to Pennsylvania's economy through industries and activities based on natural resources.

- Pennsylvania agriculture generates more than \$4 billion annually and provides hundreds of thousands of jobs.
- Nearly one out of five Pennsylvanians hunts or fishes. They spend more than \$1 billion every year on these activities.
- Almost half of all Pennsylvanians over age 16 photograph, feed, or observe wildlife. Statewide, over \$1 billion is spent annually on these interests.
- Our forest products industry is valued at \$4.5 billion per year and employs more than 100,000 people.
- Tourism, our second largest industry, generates over \$18.7 billion per year and supports more than 290,000 jobs.

Biodiversity provides the most basic economic resources, including food, fuel, timber, fiber, medicines, and recreation. Plants and animals provide a multitude of useful products, such as gums, resins, shellac, rubber, dyes, waxes, spices, and natural pesticides. These products alone contribute \$3 to \$8 billion to the U.S. economy and \$84 to \$90 billion to the global economy each year. The benefits derived from the world's ecosystems are valued at an average of \$33 trillion per year, supporting the generation of the world's wealth (by global Gross National Product) of \$18 trillion.

Many medicines and health-care products come from global biodiversity. In the United States, the commercial value of pharmaceuticals derived from the world's species is more than \$36 billion annually. Worldwide, sales of over-the-counter drugs based on plants alone total \$84 billion per year.

Some native Pennsylvania plants have medicinal value. Ginseng root stimulates the cardiovascular and central nervous systems and also lowers blood sugar, while witch hazel is used to treat bruises and skin problems such as inflammation.

To date, only 5 percent of known plants have been examined for their medicinal properties. Who knows what cure may be discovered among the remaining plant species? However, habitat destruction across the world threatens many plants with extinction. Other organisms with medicinal potential also are threatened. In view of their possible medical value, we cannot afford to lose any more species.

Natural ecosystems also provide many indirect economic benefits. For example, forests play a critical role in maintaining our water supply. By absorbing the bulk of heavy rains and retaining moisture during dry spells,

these natural water storage areas provide flood control and lessen the effects of drought.

Pennsylvania's forests serve as a 17-million-acre water treatment plant and air purification system. Trees and plants in forests release tons of oxygen daily, remove carbon dioxide, and filter and release water back into the atmosphere. The extensive root mass in forests prevents soil erosion, reducing sediment levels in surface water. Trees also keep summer temperatures lower and help to regulate rainfall cycles.

Wetlands act as natural filtration systems and remove silt, heavy metals, and other contaminants from water; they absorb and retain rainwater, gradually make it available to plant roots, and move it into aquifers and surface streams. Natural ecosystems provide all of these benefits at no cost to us. Preserving biodiversity not only provides jobs and maintains our economy, it saves money.



BIODIVERSITY PROVIDES GOOD MEDICINE

More than 40 percent of all prescription drugs—and 9 of the top 10 used in the United States—come from plants, animals, fungi, and microorganisms.

MEDICINE	USE	MATERIAL SOURCE*
Aspirin	painkiller	willow bark
Penicillin	antibiotic	bread mold
Vincristine	cancer treatment	periwinkle
Vinblastine	cancer treatment	periwinkle
Digitalis	heart stimulant	foxglove
Quinine	anti-malarial	Cinchona (coffee family)
Bacitracin	antibiotic	bacteria
Erythromycin	antibiotic	bacteria
Streptomycin	antibiotic	bacteria
Tetracycline	antibiotic	bacteria
Morphine	painkiller	opium poppy
Codeine	painkiller	opium poppy
Taxol	ovarian and breast cancer treatment	Pacific yew

* Materials from these species are specifically processed to make all prescription drugs.



FORESTS OF PLENTY

Forests provide lumbers to build houses and to make furniture, and wood pulp to produce papers. Pennsylvania's forests contain at least 90 species of trees that can provide the 10,000 board feet of lumber needed to construct and furnish an average American home. Pennsylvania's forests yield over 1 billion board feet of hardwood timber a year—more than any other state.

Pennsylvania has the largest hardwood supply in the nation and supplies nearly 70 percent of the world's black cherry lumber and veneer. The average American wood-frame home, including furnishings, easily contains at least 50 tree species.

Natural Purification Saves \$5 To \$7 Billion

For many years, the Catskills' watershed provided clean water to New York City and surrounding communities. When the watershed became polluted due to sewage, agricultural runoff, and other human activities, the city faced a choice: build an artificial filtering system for \$6 to \$8 billion, or restore the dynamic filtering capacity of the Catskills' natural purification system. The New York City administration aptly decided to restore the watershed at a cost of only \$1 billion, saving taxpayers \$5 to \$7 billion.

