

Activity 3: Natural Areas Information Sheet – Page 1 (1/2)**How much open space is needed?**

Every environment has a carrying capacity for specific organisms that live there. The carrying capacity is a point at which it can no longer support additional members of species with the natural resources they need to survive.

Carrying capacity for each animal species depends upon the amount of natural resources available on a given area of land. For example, to raise one cow, you would need one acre (about the size of a football field) of very rich pastureland, or ten acres of rangeland, or 100 acres of scrub land.

How many acres of land do you think each wild animal requires to meet their needs for an entire life span? Remember an acre is about the size of a football field and the animal must get all of its needs from its habitat.

- How much does a cottontail rabbit need? (1 acre)
- How much does a chipmunk need? (1.2 acres)
- How much does a black bear need? (38,400 acres or 60 square miles if it is a male and 3,200- 12,800 acres or 5-20 square miles, if it is a female).

Each animal has different needs. Many species need large natural woodlands and wooded corridors for survival.

- Tree species need 10 acres (300 feet minimum width)
- Forest dwelling birds need 50–1,000 acres
- Owls and raptors need 600—1,000 acres
- Large mammals need 100 acres and up

From: Guiding Growth, Compiled by CH2M Hill

If you are asked how much land a human needs for survival, we don't often realize how much land is needed to provide food, fuel, shelter and textiles. How many acres of land would one person need to provide basic needs?

That is difficult to answer since different lifestyles would determine how much land a human requires. American society creates demands on more land than any other society to meet its standard for consumer goods. Some societies need much less. According to Dr. Edward Passerini of the University of Alabama, a human needs 2.5 acres of land to basically survive.

Widely diversified ecosystems are much more likely to survive periods of environmental stress than are ecosystems with little diversification. Smaller isolated areas are more vulnerable than larger ones to extinctions due to disease, inbreeding and chronic disturbances of habitat. When wooded areas are fragmented into pieces, it is difficult for organisms to move from one habitat fragment to another.

According to Guiding Growth, habitats will lose between 30-50 percent of their species for each 90 percent reduction in area. Areas of less than 10 acres have little value for maintaining species diversity while areas of 50 –1,000 acres, may be very helpful in maintaining diversity. Areas less than 35 acres have significantly fewer species than areas of over 175 acres.

Depth is a consideration. A wooded area must be at least 300 feet wide if it is to provide a deep forest habitat. The extent of natural boundaries or edges between ecosystems is another consideration such as edges between forests and fields creating a diverse area which benefits some game animals and some common non-game animals such as raccoons and opossums.

Current strategies must recognize the need to protect regional ecosystem patterns and processes. One large forest is better than a medium forest but a medium forest is better than four adjacent forests, four adjacent forests are better than four separate smaller forests and a compact forest is better than a linear forest.

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How do we protect large natural areas? Land is protected in Pennsylvania by a variety of entities, including state agencies like DCNR and the PA Game Commission; federal agencies like the National Parks Service and the United States Department of Agriculture; local and county governments and private organizations such as land trusts and trail organizations.

Our state conservation agencies add an average of 10,000 acres every year to a 4-million acre system of public lands. The Bureau of Forestry manages 2.1 million acres of state forests. The Pennsylvania Game Commission manages 1.4 million acres of state game lands.

Another method of permanently protecting land involves acquiring the property or property rights through a land trust or conservancy. Landowners who wish to preserve a beloved place, make the decision to sell or donate their property rights or entire property to a land trust, which in turn ensures the safeguard of the property in perpetuity. As of the end of 2007, 476,550 acres of Pennsylvania have been protected by Pennsylvania land trusts.

Most land trusts are private charitable corporations. Some are governmental or quasi-governmental agencies that operate with much of the flexibility and freedom of a private land trust. Some land trusts own and operate preserves and recreation areas open to the public. Others own no land at all but hold conservation easements, which protect certain natural values on properties. Others work to acquire and then transfer critical land to government for use as parks, game lands, etc. Learn more by reading the fact sheet on land trusts or by visiting www.conserveland.org.

Municipal Tools: Municipalities are given some flexibility and control in determining where development is placed and which lands should be protected through zoning and planning tools.

Additional municipal tools may be found on the Land Recycling Fact Sheet. Visit www.conservationtools.org to learn more about additional resources available.

Conservation Subdivision Design: Conservation subdivision design allows communities to implement a subdivision and land development ordinance that requires a developer to dedicate a significant portion of land to permanent open space uses. This strategy allows developers to create open space buffers along boundaries of protected properties (e.g. a state park or forest) thus expanding the natural space.

Transfer of Development Rights: Transfer of development rights is a program set up either in a community or across several communities where a sending zone for development is established and a receiving zone for a development is established. Landowners in one area sell their development rights to landowners so developers may build in another area. Land from which development rights are sold is permanently protected while land where the sold rights are applied is enhanced in development value.

Open Space Plan: Open space plan identifies the critical lands and resources within a community that are worthy of protection. These areas may be comprised of farmland, water resources, wildlife habitat, scenic areas and may include cultural or historic resources. It is part of the comprehensive plan and is usually necessary for grant funding.

Open Space Referendum: Municipalities are authorized by PA Act 153 (“Open Space lands, Acquisition and Preservation”) to purchase land or easements for the purpose of conservation. “Local governments may levy a tax on real estate or earned income above the existing limits of the Commonwealth’s laws, but only if they first receive referendum approval from the voters. A plan to protect these resources is required prior to expenditures of open space tax revenue.