

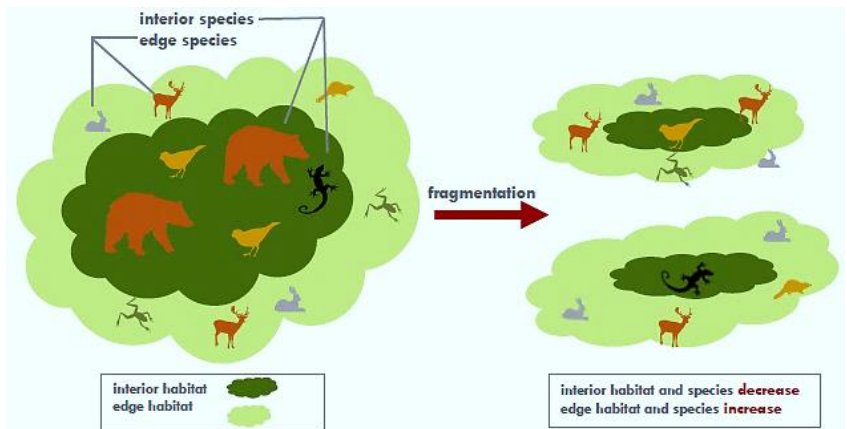
## Objective 4: Protect the biological diversity and ecological integrity of the County in both the Rural Area and Development Areas.

Biological diversity (“biodiversity” for short) is the variety of living organisms that inhabit a particular area or ecosystem. The health of biological systems is often indicated by the amount of native variety they contain. Native species have evolved to live in their current habitats and, generally, the more diverse a system is, the healthier it is. The breadth of species creates strength for all species; when a species is lost, it signals a change that may affect all species.

Worldwide, human life depends on the products of living organisms. Whether these animals, plants, or microorganisms are wild or domesticated, they provide food, medicine and industrial products essential to mankind. These products form the backbone of the world’s economy. That is, fisheries, forestry, agriculture, and other industries depend on animals and plants, and therefore rely directly on a diversity of biological resources. Soil bacteria are essential for productive farmlands. Other bacteria provide crucial vitamins and enzymes. Biodiversity of species, landscapes, and ecosystems also provides for ecological services, such as retention of clean water, production of oxygen, consumption of carbon dioxide, resistance to parasites and disease organisms, control of agricultural pests, facilitating pollination, and critical recycling of inorganic nutrients upon which all natural productivity depends.

Protection of biodiversity is important in both the Development Areas and the Rural Area. Because the quantity of resources is so much greater in the Rural Area, most of the efforts in protecting biodiversity are focused in the Rural Area. Different efforts to protect biodiversity exist for the Development Areas, such as identifying key species or systems that might be impacted by new development and considering how they should be protected. Preservation of environmental corridors, such as those shown on Parks and Green Systems plans in Development Area Master Plans helps to maintain biodiversity in the Development Areas. Equally important is the preservation of wooded corridors that extend from the Rural Area into the Development Areas. When large patches are fragmented into smaller areas, species dependent on large “interior” habitats or ranges cannot survive. As shown in Figure 4, the size of the interior habitat is reduced, minimizing area for food, cover, and movement.

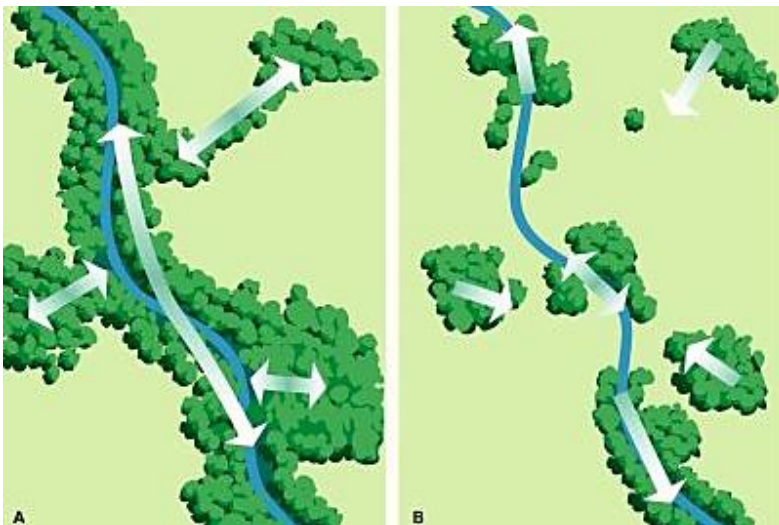
**Figure 4: Illustration of Habitat Size and Biodiversity**



Source: Linfield College Department of Sustainability, Linfield, OR. Used with permission.

Fragmentation also reduces viability for species. Loss of safe passages between habitats (shown in picture B of Figure 5) prevents species from reaching needed habitats or recolonizing habitats that have lost those species.

**Figure 5: Illustration of Habitat Range and Connectivity**



Source: Federal Interagency Stream Restoration Working Group (FISRWG)

Conversion of wildlife habitat to land uses that remove the key elements for survival result in many fewer native species and pose the greatest threat to biodiversity.

Aquatic habitats are also degraded by soil erosion when land is cleared for development. As a result, aquatic life declines and affects the health of rivers and streams. Any effort to protect the quality of ecosystems must include both terrestrial (land-based) and aquatic (water-based) ecosystems.

While the most important areas for biodiversity are in the Rural Area, the Development Areas also have a role to play in biodiversity protection. The most important features to protect in the Development Areas are wooded riparian areas, wetlands, and habitat corridors.

**Strategy 4a:** Develop an Action Plan for Biodiversity to protect significant areas of biological importance in the County.

The Natural Heritage Committee (formerly the Biodiversity Committee) was appointed by the Board of Supervisors in 2005 to create and maintain the County's Biodiversity Assessment, advise the Board of Supervisors, the Planning Commission, and County staff on applying biodiversity information to land-use decision-making, and support biodiversity education in the County. Their mission is to maintain and restore the County's native biological diversity and provide a healthy environment for the citizens of Albemarle County. This Committee will provide guidance to County staff to develop a plan of action. Developing the plan should also include other experts and volunteers.

The first step in planning for biodiversity protection is a landscape-level analysis. Such an analysis would incorporate data on the County's landforms and on the location and quality of habitats, including fragmentation and connectivity, as well as the current level of biodiversity. Aquatic biodiversity should also be addressed through a sub-watershed analysis. The landscape approach focuses on a wide scale (square miles rather than square feet) and on the management of major land features (e.g., forest blocks, watersheds, urbanized areas) to conserve biodiversity. The goal of these analyses would be to identify priority areas for conservation and restoration so that the County's policies and resources could be used to protect biodiversity in the most effective manner. Important landscape features can be prioritized for conservation measures (such as conservation easements) or for restoration efforts.

The action plan can be developed from the inventory and analysis. The plan should contain the map of important landscape features and individual species occurrences that can be included in the County's Geographic Information System. When made widely available, County staff and the public can use

the information for conservation purposes as well as reviewing requests for legislative approvals. The plan should recommend incentives and policies that would encourage land uses and conservation approaches to support the County's landscape management goals for each area of the County. Aquatic conservation should also be addressed through land management techniques designed for specific watersheds. It should also contain a set of indicators of biodiversity status that can be tracked.

The County should establish concrete goals for the Albemarle landscape, including targets for overall forest cover, the preservation of existing forest blocks, and the restoration or establishment of additional forest blocks or corridors. The County should also use the StreamWatch analysis of the relationship between land use (particularly forest cover and impervious surfaces) and water quality to classify stream health in the County's watersheds, and to develop appropriate management approaches for them.

The plan should also include recommendations for incentive programs to encourage landowners to protect habitats on their property. Homeowners can contribute to biodiversity protection by protecting habitat fragments on their properties and by using native plants for landscaping. Incentives can encourage landowners to work with the County to work toward successful habitat protection.

When completed, the action plan should be presented to the Board of Supervisors for adoption into the Comprehensive Plan. From that action plan, the Natural Heritage Committee can develop a list of short-term conservation targets. The plan should be revised periodically to reflect changes in the landscape and the conservation status of important areas of the County.

**Strategy 4b:** Regularly repeat the land use/land-cover data-gathering process (as begun in 2009) for the purpose of monitoring landscape changes.

In 2007, Albemarle County, along with the Nature Conservancy, the Rivanna River Basin Commission, and StreamWatch funded mapping of land cover in the County and the rest of the Rivanna River watershed. The first map was completed in 2009 and is provided as a layer on the County's GIS web application. Because it is such a useful tool to track change over time, it is essential to repeat because it provides feedback on the effectiveness of conservation programs and allows conservation programs to adapt to trends in landscape changes.

**Strategy 4c:** Collaborate with federal, State, and regional partners, who have geographic information on biological resources, to help build a biodiversity inventory.

Federal, State, and regional agencies all collect data on biological resources and work towards species protection. Because the County has very limited sources of information and analysis on habitats and biodiversity, it can use the assistance and existing capacity of partner agencies if working relationships are built and maintained.

One very useful strategy would be to work with the Virginia Department of Transportation to design and test wildlife overpasses and underpasses to reduce the loss of wildlife to habitat fragmentation by roads, especially between large habitat blocks. A variety of overpasses and underpass sizes can contribute to biodiversity protection, including, for example, very small tubes and tunnels that can help amphibians move between upland and wetland habitats as needed for reproduction.

**Strategy 4d:** Assess the need for hiring a County staff member with expertise in conservation biology, and/or training existing County staff in principles of conservation biology to assist in development of the Action Plan and coordination with other County actions.

When the Biodiversity Report, which may be found in the Reference Documents was developed in 2004, the County was able to provide staff to coordinate the activities of 13 residents who are also professional ornithologists, foresters, wildlife biologists, botanists, and watershed managers. However, since that time, funding cuts have limited the activities for providing support to the volunteers who are needed to create the action plan. In addition, staff time to provide input on the impacts of development on habitat is extremely limited. Staff is in a unique situation to help make the connections between science, conservation management, and planning in the County. Additional staff time for conservation would enable the County to be more effective and ensure that resources expended on these programs are put to the best use.

**Strategy 4e:** Encourage the use of native plants in landscaping to protect and provide habitat for native biodiversity, to save water, and to connect landowners to the local ecosystem.

The use of native plants in landscaping and land management projects is important to protect native biodiversity against invasive species, to save water compared to plantings not adapted to the local climate, to provide additional habitat for native species, and to help connect residents to the local ecosystems. In 2012, Albemarle County General Services staff developed a native plants database and currently strives to plant at least 80% native plants in County projects. Community Development staff should also promote use of native plants in conjunction with the site development process.

**Strategy 4f:** Increase the community's awareness of the importance of biodiversity to encourage protection of biological resources.

Volunteers and the County can support private conservation efforts by developing and disseminating educational and technical material to the general public, developers, and private land owners, including residents of the Development Areas. The material should contain information on the value of biodiversity and voluntary techniques that can be used to protect biological resources located on their land.

**Strategy 4g:** Provide information to potential land subdividers on the importance of protecting habitat when creating lots for development.

The County can help retain habitats and corridors by working with property owners early in the development process, especially in the Rural Area, to identify the benefits of protecting habitat. The County can also provide information on ways to subdivide land that provides for the most protection of habitats as well as provide information on conservation programs in the County and other agencies. More information on ways to assist property owners can be found in the Rural Area Chapter.

**Strategy 4h:** Preserve existing vegetation in areas shown as Parks and Green Systems on Development Area Master Plans.

Each Development Area Master Plan describes the importance of preserving stream corridors and other environmentally sensitive areas. These places are especially important to biodiversity as are other

areas shown as Parks and Green Systems in the Master Plan maps. The Neighborhood Model principles, found in the Development Areas Chapter, describe the importance of parks, recreational amenities, and open space in creating and maintain high quality neighborhoods. Wooded areas, riparian areas, and undeveloped well-vegetated land connecting these areas helps retain habitat corridors.