

What's the Problem with Patches?

Habitat fragmentation is one of the most serious threats to biodiversity. A researcher studying birds in one part of Australia, for example, found that the numbers and ranges of almost half the birds native to the region have decreased since the early 1900s. He thinks that almost all the decline is a result of habitat fragmentation. Small, fragmented habitats, called habitat islands, usually can't hold as many species as large, more continuous ones. Here are some of the reasons we lose species, and biodiversity, in small patches of habitat:

Luck of the draw: When a piece of habitat is destroyed, some species could be wiped out by chance alone. If a species uses only a small part of a larger area, and that part happens to be destroyed, that species and its habitat are lost. Species that are very rare or that are found only in small populations are especially at risk when their habitats are broken up into smaller and smaller chunks. **Less habitat, less diversity:** Large areas usually contain a wider variety of habitats than smaller ones. Since different habitats usually support different species, a fragmented area will often contain fewer habitats and fewer species than a larger area. Many scientists think this is the main reason diversity is lower in habitat patches.

Road blocks: Some species can live in habitat fragments if they can move from one area to another to get everything they need, such as food, shelter and mates. Unfortunately, many fragments are surrounded by barriers that prevent species from moving between different areas. Roads are a common barrier that many species can't cross but buildings, parking lots and fences can also keep species from getting where they need to go. When a species is isolated from others of its kind, it can become subject to inbreeding and lose some of its genetic diversity. Species that need a lot of space or that spend a lot of time on the move can be very sensitive to these "road blocks."

On the edge: When we build developments and break a habitat into small chunks, we create more boundaries between the habitat and the outside world. Conditions at these boundaries, called edges, are very different than the conditions in the habitat's interior. There may be more sunlight and wind at the edge, and because there's no canopy overhead to keep the moisture in, the edge is often much brighter and drier than the interior. These different conditions can change the plant and animal species living in the area. There can be different predators and prey, making it harder for animals to find food and to avoid being food themselves. In small fragments, edge conditions can take up

most of the habitat. Scientists call this problem the edge effect, and species that can't adapt to the edge often become threatened. Fragmentation doesn't affect all species in the same way. Some are more sensitive to habitat loss than others. And some species can even benefit from fragmentation and the edge effect. All of the factors listed above affect different kinds of species in different ways and that's what makes the problem of fragmentation so difficult for conservationists trying to protect a wide variety of species.

Source: Illinois Biodiversity Basics, Illinois Department of Natural Resources, Chicago Wilderness, World Wildlife Fund.