

## **What is biodiversity anyway?**

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Biodiversity is a term that most people have seen or heard of in papers, magazines or speeches relating to human's effect on the environment. It is a term however, that is not well understood and often used incorrectly. Resource extractive industries often argue that their management is good for biodiversity. Well, it depends on how you define biodiversity. Even more absurdly, I remember reading a popular article in a newspaper purporting that the biodiversity of Toronto was now higher than it had ever been because of all the exotic pets and house plants that people have in their homes.

Biodiversity is popularly thought to be the number of different species in an area. However, biodiversity is much more. It is the combined diversity of genetic variation within a population of a particular species in a given area, the number of different species within an area, the diversity of species living together within a landscape and the diversity of landscapes over a large area. Thus, biodiversity is the combined diversity of all levels of biological organization.

The term biological diversity first appeared in 1968. It was compacted to biodiversity in 1985 but not until 1992 at the UN Earth Summit in Rio de Janeiro was term biodiversity officially adopted by the Biodiversity Convention of which Canada was one of the first signatories.

So how do Biodiversity considerations relate to resource extraction such as forestry? The biodiversity of a forested landscape is a function of topography, soil type, climate, past vegetation, time, and chance. Thus, forested landscapes tend to be highly diverse at all levels of organization and they vary through time. Forest stands may consist of a few species of trees or several species as well as shrubs and many other species of plants and animals. The trees of a particular species will have varying genetic make-up which is good from the perspective of adaptation to changing conditions. Across a landscape, there is a diversity of stand types and across a region, there will be a diversity of landscape types. The particular pattern of forests across a region is neither good or bad; it is what it is. The species found in this diverse forested landscape have adapted to the specific conditions and a certain harmony exists. But nature is not static it's dynamic. Trees grow and die and what was present at one time may be quite different or the same fifty, one hundred or two hundred years later.

When a forest is harvested by clearcutting, all the trees are removed and the diverse habitats that existed for all kinds of wildlife are gone. The various animal species that lived there are either killed directly or face a slow death as they cannot just move elsewhere because elsewhere is already occupied; clearcutting created wildlife refuges.

After clearcutting, a process called succession starts to take place. Initially, alders, white birch, poplars, red maple and balsam fir, the fast-growing shade intolerant species, may become established on the area to be slowly replaced by sugar maple, ash, yellow birch, red spruce and maybe hemlock, the slow-growing shade-tolerant species, depending on conditions. A myriad of

organisms also become established in a certain sequence depending on the habitat available. Early on there may indeed be more species in a young forest than there will be later in the older forest. This is a natural progression.

Industrial forestry, however, generally homogenates a landscape because, with short-term rotation cycles, forests are not allowed to get old. Thus, early succession species dominate the landscape and late succession species are diminished. With few to no old-growth forests remaining, biodiversity across the landscape has been reduced.

The forestry industries often try to justify clearcutting by telling the public that they re-plant the area. However, generally, only one or two conifer species are planted. These species are cloned (genetically identical) and thus biodiversity is reduced. Additionally, herbicide spraying follows planting and this additionally reduces diversity by killing all broadleaved trees and plants and has its own set of negative environmental effects.

Older ecosystems, such as old growth forests often have species that are unique, they exist almost exclusively as a result of slow growth or poor ability to disperse (move) to their preferred habitats. Certain species of lichens, fungi, and beetles are examples.

Commonly when we think of wildlife and forestry we think of “animals”, that is, mammals and birds, and maybe reptiles, amphibians, and fish, the vertebrates, but not the insects, worms, lichens, mosses, and fungi. The organisms in forest ecosystems most significant in the process of nutrient cycling -- the process which makes the forest system sustainable -- are insects and fungi. Insects and fungi recycle the nutrients in the forest back into the soil. Unfortunately, these essential organisms are the ones which we know the least about.

When we clear-cut an area we disrupt biodiversity patterns unique to the area with the result that the sustainable processes maintaining the area will be lost. If we have already impacted the biodiversity of an area by clearcutting there is no telling what climate change will bring.

Biodiversity should not be thought of as just the species present in an area. Biodiversity needs to be thought of as the total variation in living organisms, animals and plants, across a large landscape. Natural processes tend to increase the biodiversity while human management tends to decrease biodiversity.