

Data Submitted (UTC 11): 8/4/2022 8:52:58 PM

First name: Bert

Last name: Corley

Organization:

Title:

Comments: Old-growth forests are unique, usually having multiple horizontal layers of vegetation representing a variety of tree species, age classes, and sizes, as well as "pit and mound" soil shape with well-established fungal nets. Because old-growth forest is structurally diverse, it provides higher-diversity habitat than forests in other stages. Thus, sometimes higher biological diversity can be sustained in old-growth forests, or at least a biodiversity that is different from other forest stages.

Old-growth forests are often biologically diverse, and home to many rare species, threatened species, and endangered species of plants and animals, such as the northern spotted owl, marbled murrelet and fisher, making them ecologically significant. Levels of biodiversity may be higher or lower in old-growth forests compared to that in second-growth forests, depending on specific circumstances, environmental variables, and geographic variables. Logging in old-growth forests is a contentious issue in many parts of the world. Excessive logging reduces biodiversity, affecting not only the old-growth forest itself, but also indigenous species that rely upon old-growth forest habitat.

Importance:

- Old-growth forests often contain rich communities of plants and animals within the habitat due to the long period of forest stability. These varied and sometimes rare species may depend on the unique environmental conditions created by these forests.

Old-growth forests serve as a reservoir for species, which cannot thrive or easily regenerate in younger forests, so they can be used as a baseline for research.

Plant species that are native to old-growth forests may someday prove to be invaluable towards curing various human ailments, as has been realized in numerous plants in tropical rainforests.

- Old-growth forests also store large amounts of carbon above and below the ground (either as humus, or in wet soils as peat). They collectively represent a very significant store of carbon. Destruction of these forests releases this carbon as greenhouse gases, and may increase the risk of global climate change. Although old-growth forests therefore serve as a global carbon dioxide sink, they are not protected by international treaties, because it is generally thought that ageing forests cease to accumulate carbon. However, in forests between 15 and 800 years of age, net ecosystem productivity (the net carbon balance of the forest including soils) is usually positive; old-growth forests accumulate carbon for centuries and contain large quantities of it.

Climatic impacts

The effects of old-growth forests in relation to global warming has been contested in various studies and journals.

The Intergovernmental Panel on Climate Change said in its 2007 report: "In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fibre, or energy from the forest, will generate the largest sustained mitigation benefit." [7]

Old-growth forests are often perceived to be in equilibrium or in a state of decay.[31] However, evidence from analysis of carbon stored above ground and in the soil has shown old-growth forests are more productive at storing carbon than younger forests.[6] Forest harvesting has little or no effect on the amount of carbon stored in the soil,[32] but other research suggests older forests that have trees of many ages, multiple layers, and little disturbance have the highest capacities for carbon storage.[33] As trees grow, they remove carbon from the atmosphere, and protecting these pools of carbon prevents emissions into the atmosphere. Proponents of harvesting the forest argue the carbon stored in wood is available for use as biomass energy (displacing fossil fuel use),[34] although using biomass as a fuel produces air pollution in the form of carbon monoxide, nitrogen oxides, volatile organic compounds, particulates, and other pollutants, in some cases at levels above those from

traditional fuel sources such as coal or natural gas.[35][36][37]

Each forest has a different potential to store carbon. For example, this potential is particularly high in the Pacific Northwest where forests are relatively productive, trees live a long time, decomposition is relatively slow, and fires are infrequent. The differences between forests must, therefore, be taken into consideration when determining how they should be managed to store carbon.[38][39]

Old-growth forests have the potential to impact climate change, but climate change is also impacting old-growth forests. As the effects of global warming grow more substantial, the ability of old-growth forests to sequester carbon is affected. Climate change showed an impact on the mortality of some dominant trees species, as observed in the Korean pine. Climate change also showed an effect on the composition of species when forests were surveyed over a 10- and 20-year period, which may disrupt the overall productivity of the forest.