**Ecosystem Type: FORESTS**

**Category: Biodiversity Conservation**

1. **Materials**

***Supplier*** – Forests are hubs of diverse species and supply materials that support biodiversity conservation. Protection strategies such as those that prevent the conversion of forests to alternative land use can be implemented to maintain these ecosystems so they can supply these materials (Phalan et al, 2011). Studies have found that species abundance is directly related to losses in habitat biomass (Gaston and Fuller, 2008; Phalan et al, 2011). Organizations like the International Union for Conservation (IUCN) can red list forest ecosystems into different statuses to protect a forest’s biodiversity and natural features. The level of protection recommended by the IUCN is based on the ecosystem characteristics. The Gap Analysis Project (GAP) is another effort that determines the degree of conservation management recommended for a site (USGS, 2011). Both of these programs can help protect the forests ability to supply materials that allow for greater biodiversity.

***Driver*** – Climate change and pollution affect the ability of forests to supply materials for biodiversity conservation (Butchart et al, 2010).

***Demander*** – not applicable

1. **Nutrition**

***Supplier*** – not applicable

***Driver*** -not applicable

***Demander*** - not applicable

1. **Energy**

***Supplier*** – not applicable

***Driver*** – not applicable

***Demander*** - not applicable

1. **Mediation of Waste, Toxics, and Other Nuisances**

***Supplier*** – Forests can support biodiversity conservation by supplying resources that help mediate wastes and toxics. For example, forests can protect the quality of aquatic ecosystems by working as a filter of pollutants and chemicals (Vidon et al., 2010; Kreutzweiser and Capell, 2001). Minimizing the amount of chemicals going into a waterway can help maintain the biodiversity of aquatic species. Conserving forests using programs like the International Union for Conservation (IUCN) red list and Gap Analysis Program (GAP) can maintain the ecosystem’s availability to mediate waste, toxics, and other nuisances.

***Driver*** – Chemicals and pollutants that occur from human and natural inputs like nitrogen and sulfur deposition impact the amount of forest available for the mediation of waste, toxics, and other nuisances to support biodiversity conservation (Fenn et al, 2003; Hulber et al, 2008). An overload of nitrogen and sulfur can negatively impact the ecosystem biodiversity, but it has also been shown that forests require a certain level of nitrogen to maintain its structure so that it can help mediate waste, toxics, and other nuisances (Nordin et al, 2005).

***Demander*** – not applicable

1. **Mediation of Flows**

***Supplier*** – Forests mediate the flow of water and sediment (Naiman and Decamps, 1997; Onaindia et al, 2013), which helps to maintain the biodiversity of its ecosystem and ecosystems that it buffers. Flood events can affect terrestrial species and be harmful to both animal and plant species during extreme flows. However, one study found that flood disruption allows for greater diversity of species because it prevented dominance of one species over the other (Deiller, Walter and Tremolieres, 2001). Implementing conservation strategies for these habitats can allow for the maintenance and survival of forest plants so that the mediation of water and sediment flows continues to occur.

***Driver*** – not applicable

***Demander*** – not applicable

1. **Maintenance of Physical, Chemical, and Biological Indicators**

***Supplier*** – Forests support biodiversity conservation because they provide the maintenance of physical, chemical, and biological indicators such as nutrient storage in their soils, buffering of the chemical composition of the nearby waterways, and carbon sequestration that allows for global climate regulation. Nutrient storage in their soils supports the growth and health of the terrestrial plant species. For example, the capture of nitrogen supports the life of a diverse group of forest species, especially in nutrient poor soils (Nordin et al, 2005; Van Der Heijden, Bardgett, and Van Straalen, 2007).

***Driver*** – The ability of forests to fix nitrogen affects the diversity of terrestrial plant species present in this ecosystem. Therefore, the amount of nitrogen that discharges into forests will influence the level of diversity of these species (Bobbink, Hornung, and Roelofs, 1998; Nordin et al, 2005).

***Demander*** – not applicable

1. **Spiritual, Symbolic, Religious, and Social Experiences**

***Supplier*** – The biodiversity of forests can provide resources that support spiritual, symbolic, religious or social experiences. Species within forest ecosystems can be a part of spiritual or ritual identities, such as those protected by communities like the “ecology monks” who have a spiritual connection to forests and believe that these ecosystems contain valuable materials worth protecting from human activities like logging (Walter, 2007). Further, organizations have formed to support the conservation of forests and emphasize the importance of human interaction with this ecosystem type (Romero and Andrade, 2004).

***Driver*** – Nutrients can impact the species available for human enjoyment during spiritual, symbolic, religious and social experiences. For example, the ability of forests to fix nitrogen affects the diversity of terrestrial plant species present in this ecosystem. Therefore, the amount of nitrogen that discharges into forests will influence the level of diversity of these species (Bobbink, Hornung, and Roelofs, 1998; Nordin et al, 2005).

***Demander*** – not applicable

1. **Physical and Intellectual Interactions w/ Biota, Ecosystems, and Land/Seascapes**

***Supplier*** – Forests provide a diverse mix of materials that can be used for subject matters like those presented in science and education. Forest diversity is studied in programs like BIOTREE (BIOdiversity and ecosystem processes in experimental TREE stands) to learn more about canopy characteristics and how they change with different mixtures of terrestrial plant species (Scherer-Lorenzen et al, 2007).

***Driver*** – Physical interactions with forest species can be influenced by inputs like nitrogen and sulfur. Studies have found that nutrients change the mix of species present (Bobbink, Hornung, and Roelofs, 1998; Nordin et al, 2005), which can influence the ability of humans to scientifically interact with a diverse group of forest plants and animals.

***Demander*** - not applicable

**Sources:**

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