**Ecosystem Type: TUNDRA**

**Category: Biodiversity Conservation**

1. **Materials**

***Supplier*** – Tundras have microhabitats that support the biodiversity of species including bacteria (Neufeld and Mohn, 2005; Gilichinsky et al., 2008). The forest-tundra habitat links many species together because of the vegetation that grows there, which animals living at the high latitude rely on for food (Hofgaard, Harper, and Golubeva, 2012).

***Driver*** – not applicable

***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*** – Tundra microbial species have the ability to mediate wastes such as leaf litter through decomposition, which also allows them to filter out nutrients to transform them for productive processes (Hobbie, 1996). These processes support the life cycle of a diverse group of plant species by providing them nutrient resources for growth.

***Driver*** – not applicable

***Demander*** – not applicable

1. **Mediation of Flows**

***Supplier*** – Tundra species are susceptible to changes in species diversity because of their ability to alter energy fluxes and the exchange of water that occurs across the landscape (Myers-Smith et al., 2011).

***Driver*** – not applicable

***Demander*** – not applicable

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

***Supplier*** – Tundras have a mix of terrestrial habitat that allow for a diverse group of species to exist. For example, tundras can be completely occupied by ice, herbaceous-dominated plant species, or shrub-dominated plant species (Walker, Gould, and Chapin III, 2001). These habitats supply resources that support the life cycle of animals living in these high latitude locations (Hofgaard, Harper, and Golubeva, 2012).

***Driver*** – not applicable

***Demander*** – not applicable

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

***Supplier*** – Tundras supply a diverse group of plant and animal species that can be enjoyed by humans in different ways. One study found that there is an industry of indigenous reindeer herders in Arctic Russia that rely on the mix of vegetative shrub species for the success of their business (Kumpula et al., 2011).

***Driver*** – not applicable

***Demander*** – not applicable

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

***Supplier*** – The unique microhabitats in permafrost covered tundras enables opportunities for researches to learn more about the pristine species that have been preserved in the frozen soils (Gilichinsky et al., 2008).

***Driver*** – not applicable

***Demander*** - not applicable

**Sources:**

Gilichinsky, D. et al. (2008) Bacteria in Permafrost. In: Margesin R., Schinner F., Marx JC., Gerday C. (Eds) Psychrophiles: from Biodiversity to Biotechnology. (pp 83-102) Springer, Berlin, Heidelberg. <https://doi.org/10.1007/978-3-540-74335-4_6>. [abstract only]

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Hofgaard, A., Harper, K.A., and Golubeva, E. (2012) The role of the circumarctic forest-tundra ecotone for Arctic biodiversity. *Biodiversity, 13*(3-4), 174-181. <https://doi.org/10.1080/14888386.2012.700560>. [abstract only]

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Myers-Smith, I.H. et al. (2011) Shrub expansion in tundra ecosystems: dynamics, impacts and research priorities. *Environmental Research Letters, 6*(4). DOI: 10.1088/1748-9326/6/4/045509.

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Walker, M.D., Gould, W.A., and Chapin, F.S. (2001) Scenarios of Biodiversity Changes in Arctic and Alpine Tundra. In: Chapin, F.S., Sala, O.E., and Huber-Sannwald, E. (Eds) *Global Biodiversity in a Changing Environment.* Ecological Studies (Analysis and Synthesis), vol 152. (pp. 83-100) Springer, New York, NY. <https://doi.org/10.1007/978-1-4613-0157-8_5>. [abstract only]