**Ecosystem Type: WETLANDS**

**Category: Recreation, Culture, and Aesthetics**

1. **Materials**

***Supplier*** – Wetlands provide materials that can be enjoyed recreationally. For example, wetlands are home to a diversity of species such as migratory and endangered birds (Gala and Young, 2015). The migratory birds can be recreationally hunted, while the endangered birds can be aesthetically enjoyed. In fact, wetlands are known for providing aesthetics because these ecosystems are more likely to have a richer diversity of species present than uplands (Howard et al., 2015).

***Driver*** – Drying wetlands for alternative uses can lead to a decrease in habitat and a reduction in biodiversity (Lou et al., 2016). A decline in biodiversity limits the availability of species hunted recreationally and negatively affects the aesthetics that wetlands provide. For example, downstream loads of nutrients, salts and bacteria increase when humans alter wetlands for development purposes and agricultural purposes (Westbrook et al., 2011).

***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*** – Wetlands are important filters of wastes, such as nutrients, salts, and bacteria, that can impact recreational use of adjacent waterways (Qasaimeh, AlSharie, and Masoud, 2015; Westbrook, Brunet, Phillips, and Davies, 2011). These ecosystems also contain terrestrial plants that can filter out air pollutants, which can improve the overall aesthetics of surrounding landscapes (Mikutta and Rothwell, 2016).

***Driver*** – Changes in land use can increase the nutrient loading in wetlands. This may cause the wetland to exceed its capacity to retain pollutants, reducing the ability for them to perform nitrification, sedimentation, and adsorption (Bassi, Kuma, Sharma, and Pardha-Saradhi, 2014). This can affect the aesthetics of surrounding ecosystem types, as well as the enjoyment one can have from the recreational uses wetlands provide.

***Demander*** – not applicable

1. **Mediation of Flows**

***Supplier*** – Wetland ecosystems slow down and trap water, which cleans out pollutants that affect the quality of surrounding ecosystems like downstream rivers (Weller, Watzin, and Wang, 1996). In addition to improving adjacent ecosystems for recreational uses, retaining water on a wetland creates a habitat that supports a unique array of species enjoyed recreationally, culturally, and aesthetically (Howard et al., 2015). For example, between fifty and eighty percent of ducks, an animal quite often hunted recreationally, hatch on prairie wetlands (Gala and Young, 2015).

***Driver*** – Developed land that is adjacent to a wetland increases the overall runoff flowing into a wetland. Greater runoff decreases the overall residence time that water has in a wetland, which impacts its ability to perform important ecosystem services such as nitrification, sedimentation, and adsorption (Bassi, Kuma, Sharma, and Pardha-Saradhi, 2014). As a result, water quality of nearby waterways may decline and species diversity is threatened. This has an effect on recreational experiences, as well as the aesthetics wetlands provide.

***Demander*** – no literature review available at this time

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

***Supplier*** – Wetlands supply terrestrial and aquatic species that filter water through processes like trapping sediments. Wetlands can trap sediments using their roots, which slows down the rate of further erosion (Gala and Young, 2015; Spalding, Mclovor, Tonneijck, Tol, and van Eijk, 2014). As result, wetlands support the recreational use of water and terrestrial species by maintaining the quality of habitats for species sensitive to pollution.

***Driver*** – Land cover affects the ability of wetland plants and animals to filter and adsorb pollutants. This can increase downstream loads of nutrients, salts and bacteria when wetlands are changed for development purposes and agricultural purposes (Westbrook et al., 2011). Ultimately, the aesthetics and recreational value that these ecosystems provide declines when they are altered.

***Demander*** – not applicable

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

***Supplier*** – Wetlands supply habitats for cultural and social experiences. Aboriginal cultures connect to water provided by these ecosystems because they use it in many roles, such as healing and sustenance activities (Pritchard, 2011). Additional activities incorporate in aboriginal cultures include recreational fishing, hunting, and gathering, and spiritual practices, which all rely on the presence of water (Pritchard, 2011).

***Driver*** – Land use changes affect the way that wetlands can provide resources and an environment that supports cultural and social experiences. Draining wetlands, adding nutrients, and developing on top of these ecosystems changes the way that wetland plants and animals can remove nutrients, metals, and other toxics from water that flow through them (Dutta, Choudhary, and Mitra, 2017; Ross, 2016; Mikutta, and Rothwell, 2016; Gala, and Young, 2015; Qasaimeh, AlSharie, and Masoud, 2015; Westbrook, Brunet, Phillips, and Davies, 2011).

***Demander*** – not applicable

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

***Supplier*** – Wetlands provide a habitat that can be used recreationally, enjoyed aesthetically, and studied culturally. Recreational uses of wetlands may involve hunting terrestrial animals (e.g., ducks) or fishing. Wetlands also provide a diverse group of species that can be enjoyed throughout the year (Rozanski, 2016; Gala and Young, 2015; Howard et al., 2015).

***Driver*** - Land use changes affect the way that wetlands can provide resources and an environment that supports recreational activities. Draining wetlands, adding nutrients, and developing on top of these ecosystems changes the way that wetland plants and animals can remove nutrients, metals, and other toxics from water that flow through them (Dutta, Choudhary, and Mitra, 2017; Ross, 2016; Mikutta, and Rothwell, 2016; Gala, and Young, 2015; Qasaimeh, AlSharie, and Masoud, 2015; Westbrook, Brunet, Phillips, and Davies, 2011). As a result, the degraded habitat decreases species available to be enjoyed through experiences like hiking.

***Demander*** - not applicable

**Sources:**

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