**Ecosystem Type: SCRUBLANDS/SHRUBLANDS**

**Category: Food, Fuel, and Materials**

1. **Materials**

***Supplier*** – Shrublands are susceptible to fire, which makes them a good resource for fuel (Keeley and Fotheringham, 2003). The vegetative shrubs are also resources of food for animals such as the red fox (Aronne and Russo, 1998), which can be hunted for human consumption.

***Driver*** – The presence of shrubs and variation in species for food and materials depends on the activity of seed dispersers such as the Japanese marten (Otani, 2002).

***Demander*** – not applicable

1. **Nutrition**

***Supplier*** – Shrubland ecosystems provide food like red deer and Spanish ibex (Martinez, 2009).

***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*** – Plants and animals in agroecosystems help mediate wastes that come from nutrients and chemicals, which increases the productivity of agroecosystems for food (Altieri, 1999).

***Driver*** – not applicable

***Demander*** – not applicable

1. **Mediation of Flows**

***Supplier*** – not applicable

***Driver*** – not applicable

***Demander*** – not applicable

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

***Supplier*** – Shrubs provide a food supply for species, even during periods of drought because of their ability to withstand long periods of dry climate (Puig et al., 2010).

***Driver*** – Agroecosystems near or on wet soils can experience changes in productivity based on the amount of nitrogen and other chemicals flowing into ecosystem. Agroecosystems that may contain wet soils include rice-wheat crops (Xie et al., 2008).

***Demander*** – not applicable

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

***Supplier*** – not applicable

***Driver*** – not applicable

***Demander*** – not applicable

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

***Supplier*** – There is an increasing interest in studying agroecosystems because they have an impact on the political and economic culture of countries around the globe (McMichael, 2012). Research has shown that food security has always been a concern by governments, so the trend has been to secure this commodity by investing resources in offshore land to build more agroecosystems – a trend that may have catastrophic effects (McMichael, 2012).

***Driver*** – not applicable

***Demander*** - not applicable

**Sources:**

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Keeley, J.E. and Fotheringham, C.J. (2003) Impact of Past, Present, and Future Fire Regimes on North American Mediterranean Shrublands. *Fire and Climatic Change in Temperate Ecosystems of the Western Americas, 160,* 218-262. <https://doi.org/10.1007/0-387-21710-X_8>. [abstract only]

Martinez, T. (2009) Role of Various Woody Species in Spanish Mediterranean Forest and Scrubland as Food Resources for Spanish Ibex (*Capra pyrenaica* Schinz) and Red Deer (*Cervus elphus* L.). *Agroforestry in Europe, 6,* 233-253. <https://doi.org/10.1007/978-1-4020-8272-6_11>. [abstract only]

Otani, T. (2002) Seed dispersal by Japanese marten *Martes melampus* in the subalpine shrubland of northern Japan. *Ecological Research, 17*(1), 29-38. DOI: 10.1046/j.1440-1703.2002.00460.x. [abstract only]

Puig, S. et al. (2010) Diet of the mara (*Dolichotis patagonum*), food availability and effects of an extended drought in Northern Patagonia (Mendoza, Argentina). *Mammalian Biology, 75*(5), 389-398. <https://doi.org/10.1016/j.mambio.2009.12.003>. [abstract only]