

Appendix 12

Literature related to conditional probabilities. Twenty owners of large, forested properties (at least 20 ha in total area with at least 4 ha of forest) in Macon County, North Carolina, participated in a structured decision making (SDM) process consisting of two series of workshops with ten landowners each. In each series, landowners evaluated what they can do to their forest to maximize the achievement of their land use objectives. Forest management decision options were evaluated through a decision network that predicted expected outcomes from each decision option. Conditional probabilities describing the probability of outcomes given states were required to analyze the decision network. Here we describe literature supporting the conditional probabilities used in our decision network.

Although we were not able to obtain conditional probabilities directly from the scientific literature, patterns indicated in the literature were consistent with the conditional probabilities we gathered from experts. For example, fire risk is very low in the southern Appalachian region (Lafon et al. 2005, Fowler and Konopik 2007). The erosion risk tends to increase when more trees are removed, but erosion risk is low if forest cover is high (Montgomery et al. 2000, Hood et al. 2002, Dhakal and Sidle 2003, Miller and Burnett 2007). Similarly, water quality is high if the forest cover is high, but as more trees are removed, water quality tends to decrease (Aust and Blinn 2004, Stednick et al. 2004). Also, the abundance of exotic species appears to increase as the intensity of the forest use increases (Belote et al. 2008, Burnham and Lee 2010). The effects of disturbance on the conservation value of the forest for birds (Norris et al. 2009, Twedt and Somershoe 2009) and herpetofauna (Semlitsch et al. 2009, Strojny and Hunter 2010, Tilghman et al. 2012, Hocking et al. 2013) may be variable, but generally, the conservation value is expected to decrease as disturbance increases. While the effects of disturbance on the abundance of shade-intolerant trees may be variable also, abundance typically increases with disturbance that opens increasing amounts of canopy cover (LeDoux 1999, Webster and Lorimer 2005, Richards and Hart 2011, Lhotka 2013).

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