Literature review

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“Fire cause disturbances which is inherent, unavoidable and affects in all levels of an ecosystem” (White and Jentsch, 2001). The disturbances caused by the fire cannot be avoided and it can occur in the young, recently established vegetation as well as in a fully grown natural forest. Fire has concentrated effects on vegetation development since fire wipe out unwanted vegetation and thus creating emergent space for other species to occupy (Oliver, 1990). The skillful burning of the vegetation cover has affected water and vegetation composition of the disturbed areas and eventually adapted to the new conditions. Besides the influential effect on water moisture content and vegetation composition, fire also increases the frequency of sheet flow and rill formation (Naveh, 1984).

The government and the forest department of Mississippi State in USA had learned from their practical experiment, the effects and benefits of prescribed burning. Before acquiring all these knowledge, they have lost most of their natural forest to fire. They learned that fire is created with a set of goals and in a controlled manner will be the best tool for forest management, but it is cautioned regarding the creation of public nuisance due to this activities. Ten Southern states of Mississippi State in USA have passed laws to define prescribed burning as a legal activity with ecological and social benefits (Brasher, 1992).

Using fire as a forest management tools in a controlled method improves wildlife habitat, reduces perilous fuels, prepare sites for seeding and plantation, and manage competing vegetation and controls pests and diseases. Unwanted species, understorey trees and shrubs with dead needles and leaves act as a stepladder fuels, allowing fire to climb up the overstorey crowns and ultimately maximizes the level of devastation by uncontrolled fire. In this case, prescribed fire in advance serves as a management tool where the competing vegetation is controlled. “Since the earliest times, fire has patently been one of the agent where the habitats of plants and animals are modified and changed” (Walter Hough, 1926).

A fungal infection called Brownspot can be eliminated along the diseased needles without killing the terminal bud by implementing prescribed burning as a practical method. This type of method

also reduces problems of root rot where the environment of the forest floor is rehabilitated. In the southern Appalachians, fire is being used in white pine seed orchards to destroy hibernating white pine cone beetles. (Brown, A.A. & Davis, K.P. 1973. (2nd ed.), p. 584).

The understorey vegetation coverage of forest is high where there is no history of forest fire for more than 20 years followed by areas moderately affected by fires and highly affected areas. In such types of forest, there will be more competition with regard to space, soil nutrients, water and sunlight. In comparison, the density of *Pinus roxburghii* seedling was low under the moderately disturbed areas by fire (Mani, S. 2005). A light fire did not cause any significant damage to the mature Aleppo and Brutia pine plantation (Kutiel, P. and Inbar, M, 1993). Beside these damage, the soil nutrients are enhanced and contributed to the regeneration and germination of the understorey vegetation.

The surveys were carried out in order to understand the knowledge, attitude and opinions on prescribed burning in West Virginia (Piatek, K.B and McGill, D.W, 2009). According to this hypothesis, 64% of the landowner of West Virginia are supporting the use of prescribed fire as a general forest management tool but not specifically to the regeneration of oak trees. This indicates the level of knowledge on impact of fire in general. People understood that fire helps in many ways to manage the forest such as vegetation control, space creation and reduction of hazardous fuels but while the burning undergoes in a natural forest, the complete regeneration of oak seedlings and sapling are being eliminated.

The cautious and controlled use of fire respecting the vegetation stage and the management objectives could be an appropriate management tool (Bloesch, U. 1999). The impact of fire on different vegetation stages has different response. Besides the management procedures and objectives, the understorey vegetation which is considered unwanted can be burned to increase forage for cattles, space for other useful species to grow, reduce hazardous fuels preventing wildfires and reducing competition in terms of sunlight, nutrients availability and space.