

Decades of successful fire suppression efforts have led to the overgrowth of today's forests. As a result, there has been an increase in severe wildfire events and total fire suppression spending. Management of a forest prior to a fire, through techniques such as mechanical thinning, prescribed fire, etc., can help decrease the severity of a fire and the cost to suppress it. We formulate systems of differential equations to represent the dynamics before and after a fire. The time of fire occurrence is given as a random variable with a specified distribution. Using optimal control methods, we determine an optimal management expenditure schedule for a forest before a fire occurs and optimal suppression costs of a fire once it occurs.