

Data Submitted (UTC 11): 11/6/2022 12:00:00 PM

First name: Lonnie

Last name: Crotts

Organization:

Title:

Comments: The hazardous effects of setting forests on fire result in death and injury to animals, however the USFS neither acknowledges or studies the long term impacts to animals in the burn zones. The obvious, but unacknowledged truth is that "fire on animals can be direct and immediate for animals although some effects, such as shortened lifespan or impaired fitness of wounded individuals following a fire event, may play out over years or decades. Physiological effects of short exposure to fire on animals are poorly known. "

Prescribed Burns and Animal Mortality R. Todd Engstrom

<https://fireecology.springeropen.com/articles/10.4996/fireecology.0601115?fbclid=IwAR3traRwsG4Cw5W1Z0WgvOJMH36lywy69CEaj1z1rociN1EcXuEzs68Ww0#author-information>

Behavioral Responses, Injury, and Mortality

"The hazardous effects of fire on animals can be direct and immediate, although some effects, such as shortened lifespan or impaired fitness of wounded individuals following a fire event, may play out over years or decades. Physiological effects of short exposure to fire on animals are poorly known, but some inferences can be made from studies of responses of animals to high ambient temperatures. The highest body temperature that animals can tolerate is about 50 [deg]C. Above this temperature, cells undergo denaturation of proteins, enzymes become inactive faster than they can be re-formed, and membrane structure degrades (Schmidt-Nielson 1979). In addition to these heat related factors, oxygen depletion and exposure to toxic compounds following smoke inhalation may be critical factors to animal survival during exposure to fire. The length of time that an organism is exposed to high temperature, anoxia, or smoke is critical; thus, fire detection and avoidance are essential behaviors for survival, especially for less-mobile animals (Whelan 1995)."

Author recommendations

1. More studies of populations of marked individuals need to be made before, during, and after fires. This will permit better distinction between mortality and emigration and reveal important details about how individuals respond to fire. Studies of marked individuals have elucidated details about how life history stage and season (Griffiths and Christian 1996) of fire can influence likelihood of mortality from fire.
2. Take quantitative measurements of fire characteristics. Too many studies of fire effects on animal populations fail to report quantitative characteristics of the fires involved in the study. Use of standard descriptors of fire would permit easier comparison among studies and facilitate meta-analysis of multiple studies.
3. To provide targets for modeling, focus needs to be given to chains of causality that start at direct fire effects and end at important habitat effects. Use of devices, such as the fire envirogram presented here, can be used to make causal links between first-order (e.g., tree and shrub mortality) and second-order fire effects such as habitat structure and composition (see Reinhardt and Dickinson 2010). SCEA is an efficient approach to conduct research on such connections."