

4.6 - Other

! **Fire and Fire Surrogates Project, JFSP** - Preliminary planning by the USGS Southern Sierra Research Station within the Parks for the Fire and Fire Surrogates Project was begun in 1999. Planning continued during 2000 and a project coordinator position was filled by Eric Knapp. Eric will develop detailed protocols and sampling strategies for the project area. This project will examine effects of burning in lower mixed-conifer forest during differing seasons and will be one subsite in a national network of sites being funded as part of the Joint Fire Sciences Program to investigate the consequences of fire and fire surrogate treatments. The study will use a subset three standard experimental design and protocol developed for the national study. These methods will allow evaluation of fuel treatments so that results are comparable across agencies, fuel types, and geographic areas. Current plans are to carry out fall burning during the 2001 and spring burning during 2002. (Jon Keeley, Nate Stephenson, and Eric Knapp - USGS)

! **Fire and Invasive Annual Grasses in Western Ecosystems: Cheatgrass** - Preliminary planning was begun in 2000 by the USGS Southern Sierra Research Station within the Parks for the this project, funded by the Joint Fire Sciences Program. Within the Parks the work will primarily focus on the cheatgrass invasion in the Cedar Grove area of Kings Canyon that may be related to fire and other disturbances. (Matt Brooks¹, Jayne Belnap², Jon E. Keeley³, and Robert Sanford⁴)

Project Abstract from JFSP proposal

Annual grasses have invaded shrub and forest ecosystems in western North America and are linked to changes in both ecosystem structure and function and in some cases have altered fire regimes. This has occurred over vast expanses of public lands in the Great Basin and the Mojave Desert, and is a threat to lower elevation yellow pine forests. The investigators hypothesize that fire has the potential for contributing the most to annual grass invasion in low nutrient soils, where postfire increases in their availability are more effectively exploited by invasive grasses than by the native flora. Soil nutrient changes can vary widely depending on soil properties and the amount and duration of soil heating. In forested ecosystems such impacts of fire on soil nutrients and light solar radiation are potentially more profound now than under historic conditions because of unnaturally high fuel loads.

They propose to investigate the interactions between fire and soil nutrients over three ecosystems currently dominated or threatened by invasive annual grasses in western North America -- Great Basin shrubland, Mojave Desert scrub and Sierra Nevada yellow pine forest. Common factors driving the fire/annual grass cycle in these ecosystems will lead to generalizations widely applicable beyond the ecosystems under study. In addition, each of these systems has unique features that contribute to the dominance of invasive annual grasses, and elucidation of these will contribute to a broader understanding of the problem.

They will use intensive field manipulations at representative sites in these three regions that will couple burning, nutrients, fuels and light treatments. In addition, extensive surveys will be conducted across these regions to assess the soil nutrient status associated with invaded and non-invaded sites. These field studies will be coupled with laboratory studies to examine in detail the relationship between soil heating

and nutrient availability for invasive grasses. With this information, managers could determine in advance if habitats are naturally vulnerable or resistant to invasions, enabling limited resources to be more effectively deployed both during and after fires. Fire prescriptions could be designed to avoid creating conditions susceptible to invasion, plus, restoration techniques could be better targeted, saving both time and money.

¹ U.S. Geological Survey, Biological Resources Discipline, Western Ecological Research, Las Vegas, Nevada

² U.S. Geological Survey, Biological Resources Discipline, Forest and Rangeland Ecosystem Science Center, Moab, Utah

³ U.S. Geological Survey, Biological Resources Discipline, Western Ecological Research Center, Sequoia-Kings Canyon National Parks, Three Rivers, California

⁴ Department of Biological Sciences, University of Denver, Denver, Colorado