DOES WILDFIRE FAVOR INVASION OF NONNATIVE FISHES?[AFS]

Clint M. Sestrich and Thomas E. McMahon
Department of Ecology, Montana State University
Bozeman, MT 59717
csestrich@montana.edu
tmcmahon@montana.edu

Micheal K. Young
USDA Forest Service
Rocky Mountain Research Station
P.O. Box 8089, Missoula, Montana 59807
mkyoung@fs.fed.us

Many studies have documented rapid recovery of fish populations following wildfire disturbance. However, it is not known if wildfire effects can tip the balance in favor of nonnative fishes. Therefore, we are testing the hypothesis that increases in stream temperature, sedimentation, and reduced habitat complexity following wildfires favor nonnative trout in mixed native and nonnative salmonid communities. We are conducting the study in the upper Bitterroot River drainage in western Montana, the site of a 1440 km² wildfire complex in 2000. Westslope cutthroat trout (*Oncorhynchus clarki lewisi*), bull trout (*Salvelinus confluentus*), and brook trout (*Salvelinus fontinalis*) are patchily distributed across the drainage. Pre-fire fish population data for many basins in the watershed allow unique comparisons of changes in fish species composition and abundance among sites varying in fire severity, presence of fire-induced debris flows, and distance to source populations for colonization of defaunated reaches. We found that mean daily temperatures in reaches affected by high-severity fire increased by 3.7 ˚C compared to 0.9 ˚C in unburned reaches. Following initial fire-induced population declines, reaches in high-severity burns averaged a 110 percent increase in fish abundance from 2001 to 2002. In contrast, populations in reaches affected by debris flows increased little from 2001and averaged only 8 percent of pre-fire abundance in 2002. Although analyses of 2003 data are preliminary, brook trout abundance appears to be increasing relative to native bull trout and westslope cutthroat trout in reaches with fire-induced sediment and temperature increases.