

Western Ecological Research Center

Publication Brief for Resource Managers

Release:
July 2004

Contacts:
Dr. Matthew L. Brooks¹
Dr. James B. Grace²
Dr. Jon E. Keeley³
Dr. David A. Pyke⁴

Phone:
702-564-4615
337-266-8632
559-565-3170
541-750-7334

Email:
matt_brooks@usgs.gov
jim_grace@usgs.gov
jon_keeley@usgs.gov
david_a_pyke@usgs.gov

¹Las Vegas Field Station, USGS Western Ecological Research Center, 160 N. Stephanie, Henderson, NV 89074

²USGS National Wetlands Research Center, ³Sequoia and Kings Canyon Field Station, USGS Western Ecological Research Center, ⁴USGS Forest and Rangeland Ecosystem Science Center

Effects of Invasive Alien Plants on Fire Regimes

Plant invasions are widely recognized as significant threats to biodiversity conservation worldwide, and effective management requires an understanding of the mechanisms that promote invasion and lead to subsequent ecological impacts. A recent publication in *BioScience* by USGS, in collaboration with other scientists from North America, Australia, and South Africa, presents a multi-phase model describing the interrelationships between plant invaders and fire regimes.

One way invasions can affect native ecosystems is by changing fuel properties, which then affect fire behavior, and can ultimately alter fire regime characteristics such as frequency, intensity, extent, type, and seasonality of fire. If changes in fire regime subsequently promote the dominance of the invaders, then an invasive plant/fire regime cycle can be established. As more ecosystem components and interactions are altered, restoration of pre-invasion conditions becomes more difficult. Restoration may require managing fuel conditions, fire regimes, native plant communities and other ecosystem properties, in addition to the invaders that caused the changes in the first place.

The authors of this article provide a system to evaluate the relative effects of invaders and prioritize them for control, and recommend ways to restore pre-invasion fire regime properties. They also examine costs and probabilities of successful prevention or mitigation efforts.

Brooks, M. L., C. M. D'Antonio, D. M. Richardson, J. B. Grace, J. E. Keeley, J. M. DiTomaso, R. J. Hobbs, M. Pellant, D. Pyke. 2004. *Effects of invasive alien plants on fire regimes. BioScience* 54(7):677-688.

Management Implications:

- Plant invasions can either promote or suppress fire by altering fuel characteristics.
- Fuel changes occur directly via the biomass produced by the invaders, and indirectly through the invaders' effects on native plants.
- Restoration of pre-invasion ecosystem characteristics may require drastic measures if fire regimes have been altered.

