

Western Ecological Research Center and Forest and Rangeland Ecosystem Science Center *Publication Brief for Resource Managers*

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Invasive Plants and Fire in the Deserts of North America

The ecology of invasive plants and fire are closely interrelated. For example, changes in invasive plant dominance affect landscape flammability, and changes in fire frequency affect landscape invasibility. In a recent publication by USGS scientists, Drs. Matthew L. Brooks and David A. Pyke discussed these interrelationships, and concluded that the management of fire and invasive plants must be closely integrated for each to be managed effectively.

Fire was historically infrequent in shrublands dominated by saltbush and creosotebush in the southern Great Basin, Mojave, and western Sonoran deserts. Invasive grasses now create large amounts of continuous fine fuels where very little previously existed, and these fuels have increased the spread rate and frequency of fire, especially after years of high rainfall. Management of invasive plants and suppression of fire are top priorities in these arid desert shrublands.

Fire occurred periodically in shrublands dominated by sagebrush in the northern Great Basin and the semi-desert plateau regions of western North America. Fire suppression has allowed woodland species such as juniper to expand their ranges in some areas. The reintroduction of fire to reclaim sagebrush is complicated by postfire plant invasions that can competitively suppress the reestablishment of native plants and increase fire frequency to the point where natives cannot recover. Methods other than fire need to be used to manage woodland species where the potential for postfire invasion by fire-adapted invasive plants is high.

Fire was historically very frequent in perennial grasslands of the Chihuahuan and eastern Sonoran deserts. Suppression of fire has allowed shrubs such as creosotebush and mesquite to invade from adjacent areas. Fire

Management Implications:

- Fire can be used to control invasive plants if it kills adult plants, their perennating tissues, or eliminates seed banks, but follow-up treatments are often necessary.
- Invasive species with the ability to survive fire or reestablish from long-lived seed banks should not be managed using fire.
- When targeting invasive plants for control, the potential benefits to other invasive species must always be considered.
- Reintroduction of fire where it has been suppressed often facilitates the invasion of fire-adapted invasive plants that can prevent the reestablishment of historical fire regimes.

has been used to control woody shrubs and restore native perennial grasses, but invasive aliens such as Lehmann's lovegrass often benefit as well.

The authors of this publication, along with other scientists, are attempting to determine how prefire site characteristics, fire history, and climate interact to influence fire behavior and postfire site characteristics. Armed with this information, land managers will be able to better decide how to manage fire and invasives in the deserts of North America.

Brooks, M. L. and D. A. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pages 1–14 in K. E. M. Galley and T. P. Wilson (eds.), Proceedings of the Invasive Species Workshop: The Role of Fire in the Spread and Control of Invasive Species. Fire Conference 2000: The First National Congress on Fire Ecology, Prevention, and Management. Miscellaneous Publication No. 11. Tall Timbers Research Station, Tallahassee, FL.