

Final Report

Publication of literature synthesis “Effects of Fire on Nonnative Invasive Plants” as 6th volume in the General Technical Report “Wildland Fire in Ecosystems” (“Rainbow” series)

JFSP task 04-4-1-08

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Sept. 25, 2007

This report is submitted in hard copy (1) and CD-ROM (20 copies) as documentation of work produced for the Joint Fire Science Program.

Summary: This task has written a General Technical Report entitled *Wildland Fire in Ecosystems-- Fire and Nonnative Invasive Plants*, the 6th volume of the Rainbow Series. The report has received peer review, statistical review, and policy review, and is approved for publication. It is now in press at the Rocky Mountain Research Station's Publications Office and online at www.fs.fed.us/fmi/products/Zouhar_et_al_2007.html. This Final Report contains the complete General Technical Report in .pdf form; as soon as it is published, 20 printed copies will be forwarded to the Joint Fire Science Program. In addition to the General Technical Report, this task has completed science delivery as follows: produced a CD containing the 5 reports currently completed for the Rainbow Series plus training materials for the Rainbow Series and Fire Effects Information System; provided the CD to course coordinators for the Rx310 series; presented a full-day special session on fire and nonnative invasive plants, containing 22 presentations and 5 discussion periods, at the 3rd International Fire Ecology & Management Congress, Nov. 13-17, 2006, in San Diego; and presented two seminars and one poster session on this report.

List of objectives and accomplishments: The objectives of these JFSP tasks were

- 1) Produce a General Technical Report in the *Wildland Fire in Ecosystems* ("Rainbow") series that
 - synthesizes scientific knowledge regarding the biological and ecological concepts underlying relationships between fire and nonnative invasive plant species
 - identifies the plant communities where fire-invasive issues are of greatest concern in each geographic region, synthesizes information unique to that area, and describes emerging fire-invasive issues in the region
 - synthesizes the literature regarding other important fire-invasive issues, including effects of fire suppression and fuel management activities, monitoring, and integration of management programs
- 2) Systematically distribute the entire Rainbow Series on CD to educators who train fire managers and vegetation managers

Objective 1 is met by having RMRS-GTR-42-volume 6 approved for publication, available online, and in press at the Rocky Mountain Research Station.

Citation: Zouhar, Kristin; Smith, Jane Kapler; Sutherland, Steve; Brooks, Matthew L., eds. [In press]. Wildland fire in ecosystems: fire and nonnative invasive plants. Gen. Tech. Rep. RMRS-GTR-42-volume 6. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Link here to the [Table of Contents for *Fire and Nonnative Invasive Species*](http://www.fs.fed.us/fmi/products/Zouhar_et_al_2007.html) and a .pdf file of each chapter. These files are available for download at www.fs.fed.us/fmi/products/Zouhar_et_al_2007.html. As soon as the publication is in print, copies will be forwarded to the Joint Fire Science Program.

Fire and Nonnative Invasive Plants synthesizes scientific knowledge regarding relationships between fire and nonnative invasive plants. *Fire and nonnative invasive plants* has three parts. Part I reviews scientific knowledge about the three unifying themes identified above. Part II covers relationships between fire and nonnative invasive plants according to bioregion: Northeastern, Southeastern, Central, Interior West, Southwestern Pacific Coastal, Northwestern Pacific Coastal (including Alaska), and Hawaiian Islands; each of these chapters covers the three unifying themes and also describes research questions and emerging issues of special concern in the bioregion. Part III focuses on research and management issues of national scope: knowledge gaps, effects of nonfire fuel treatments on plant invasions, effects of postfire management on invasions, and monitoring issues.

Three unifying themes are addressed throughout the volume: effects of fire on nonnative invasive plants, effects of nonnative invasives on fire regimes, and use of fire to manage nonnative invasives. Because the literature on nonnative species tends to focus on problematic species in severely invaded plant communities, the editors were especially careful to require that authors describe the scope of inference of knowledge by identifying geographic scope and/or nature of citations-- from anecdotal to review to primary research. The authors also take care to remind readers that a review cannot offer more knowledge than what scientists and other experts have made available, so continued research and sharing of information are needed. Every chapter addresses management issues; the specific issues listed in Objective 1 of the proposal (above) and treatment of global change can be located as follows:

Management Issue	Location
Effects of fire suppression	Chapter 14
Effects of fuel management activities (fire)	Chapters 2 & 4 Throughout Part II
Effects of fuel management activities (nonfire)	Chapter 13
Monitoring	Chapter 15
Integration of management programs	Chapter 4 Throughout Part II
Global change	Chapters 2, 10, & 16

Chapter 12, "Gaps in scientific knowledge," analyzes the knowledge gaps—perhaps better termed "knowledge gulfs"—that remain in regard to relationships between fire and nonnative invasive plants. This information applies to management but also, perhaps more significantly, to the scope and direction of future research on fire and nonnative invasives.

Objective 2 is met by the following Science Application/Delivery activities:

2-1. Produced a CD entitled [Fire Effects Literature Reviews for Managers](#), which contains the 5 reports currently completed for the Rainbow Series, plus training materials for the Rainbow Series and Fire Effects Information System.

2-2. We are sending the CD to Noble Dunn, course coordinator for Rx310, and to Lisa Morris, TNC instructor in . We will promote use of the CD in the Rx series and will also send it to partners in The Nature Conservancy and anyone else who asks for it. Link here to the [letter of transmittal](#).

2-3. Planned and presented a full-day special session on [Fire and Nonnative Invasive Plants](#) at the 3rd International Fire Ecology & Management Congress, Nov. 13-17, 2006, in San Diego. The special session had two parts:

- The morning session highlighted the Rainbow Series report produced for this task and is a direct product of this task. [Link here to the Morning Program](#), including abstracts for all presentations and copies of the presentations.
- The afternoon session highlighted research on nonnative plants and fuels, including nonfire fuel treatments, in the Western states. The session was leveraged by this task but is not a direct product of the task. [Link here to the Afternoon Program](#), including abstracts and copies of presentations.

Additional products, not included in the proposal:

Seminar at Fire Lab on Chapter 12 of the report, "[Gaps in Scientific Knowledge about Fire & Nonnative Invasive Plants](#)"

Seminar at Fire Lab on entire report, "Wildland Fire in Ecosystems-- Fire and Nonnative Invasive Plants," [Part I \(Smith\)](#), [Part II \(Zouhar\)](#), and [Part III \(Sutherland\)](#).

[Poster](#)

The editors and authors are grateful to the Joint Fire Science Program for their support and patience. We also thank the many reviewers, technical specialists, and others who helped us produce the volume, listed in the report's Acknowledgments.

Products are listed in the Appendix, a [crosswalk between proposed and delivered science application and delivery activities](#).