U.S. DEPARTMENT OF THE INTERIOR
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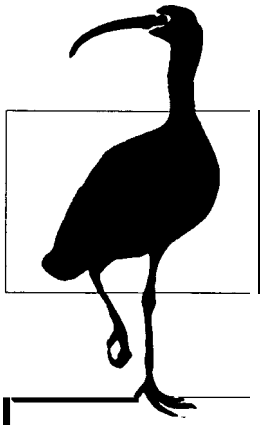
Information and Technology Report 2

Threatened and Endangered Plants: An Annotated Bibliography



U.S. DEPARTMENT OF THE INTERIOR
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EFFECTS OF FIRE ON THREATENED AND ENDANGERED PLANTS: AN ANNOTATED BIBLIOGRAPHY

BY

Amy Hessl

and

Susan Spackman

Contents

*Frontispiece: Peter's Mountain mallow (*Iliamna corei*), a federally listed endangered plant, responded favorably to fire. Photo courtesy of The Nature Conservancy, Virginia Field Office.*

Effects of Fire on Threatened and Endangered Plants: An Annotated Bibliography

by

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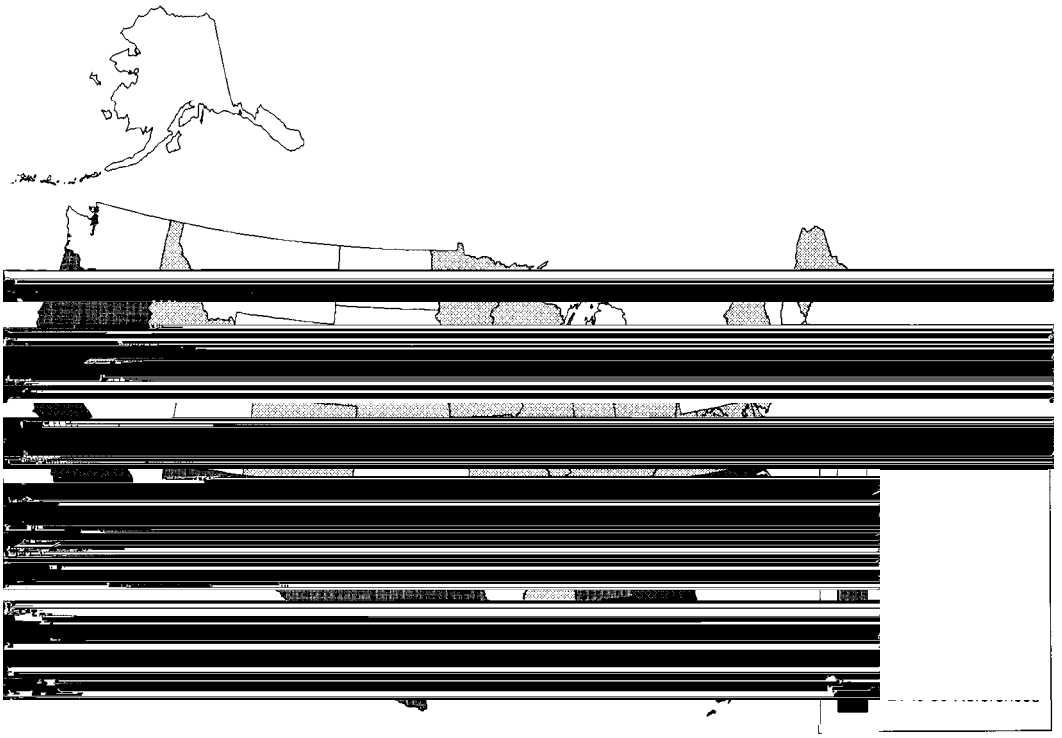
Abstract. This bibliography presents basic information about the effects of

Service 1987, 1992b,



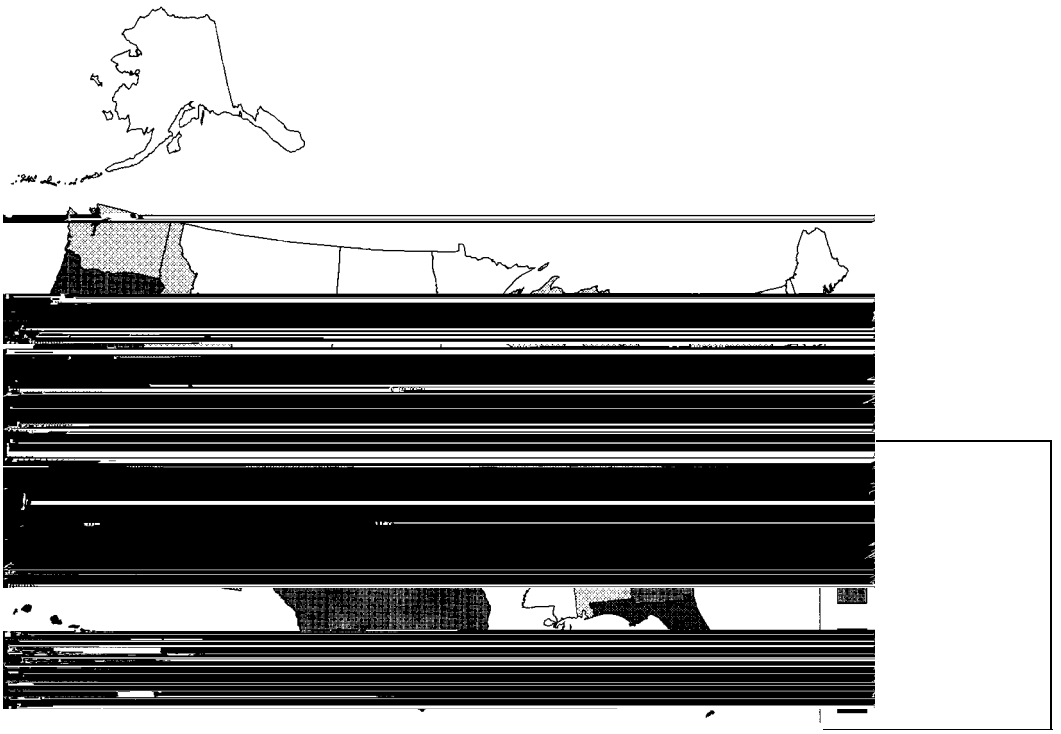


Table 3. *Continued.*

Scientific name	Common name	Status	Source	Response
				establishment
[illegible]	[illegible]	[illegible]	USFWS 1991a	Threatened by fire [illegible]
Castilleja xanthomeris	[illegible]	[illegible]	[illegible]	[illegible]
			Johnson 1994	Occurs in fire-adapted community
			Menges and McAnlis 1994	

Table 3. *Continued.*

Scientific name	Common name	Status	Source	Response
Echinocereus pectinatus				
E. reichenbachii				
E. triglochidiatus				
Eremalche kemensis (*S* = *E.*				

Table 3. *Continued.*

Scientific name	Common name	Status	Source	Response
Hedeoma graveolens (S = Stachydeoma graveolens)				
Hedyotis st.-johnii				
Helianthemum				

Table 3.

Table 3. Continued.

Scientific name	Common name	Status	Source	Response
Polygonella articulata				
P. basiramia	Wireweed			
P. macrophylla	Large-leaved jointweed			
Portulaca sclerocarpa	*Po'e*			
Pritchardia munroi				
Prunus geniculata				

Table 3.

Table 3. Continued.

Scientific name	Common name	Status	Source	Response

on existing populations of endangered species must be repeated for at least two years before the long-term effects become discernible. [AS].

Helianthus schweinitzii (E)

4. BARKER, N. G., AND G. B. WILLIAMSON. 1988. Effects of winter fire on *Sarracenia data* and S. *psittacina*. American Journal of Botany 75: 138-143.

The effects of a prescribed winter bum on two species of pitcher plant, *Surrucenia alata* and S. *psittucina,* were investigated by comparing changes in variables measured before and after the fire in randomly selected plots in a Louisiana savanna. Burned plots showed an increase in foliage and unburned plots showed a decrease in foliage, as measured in the total numbers of leaves (>25 cm) for S. *alata* and in total cover for S. *psittucina.* For S.

Two species, *Lomatium cookii and* ***Limnanthes floccosa*** ssp. ***grandiflora*** were monitored before and after a prescribed bum and wildfire in the Agate Desert mounded prairie of southwestern Oregon. Because the sampling design included only three replicates per treatment for each species, a determination of statistically significant effects of the fires was difficult. *Lomatium cookii* did not have an obvious negative response to the burns. *Limnanthes jloccosa* ssp. ***grandiflora*** recovered during the second year after the fires, and its abundance at that site was greater than previously.

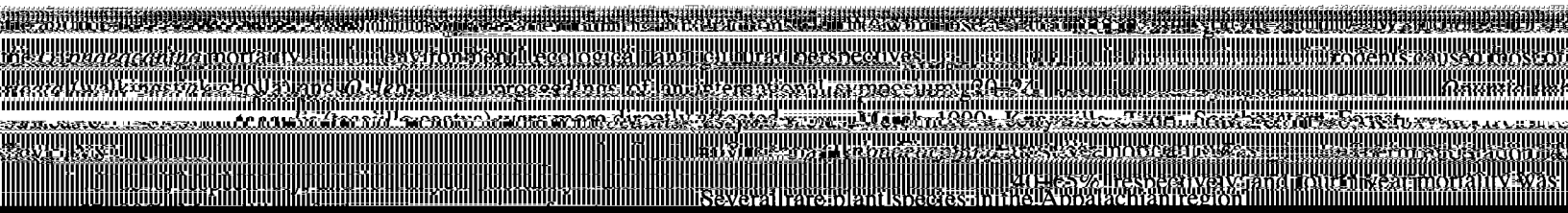
Lomatium cookii (Cl), ***Limnanthes floccosa*** ssp. ***grandiflora (C2)***

9. BOWLES, M. L., M. M. **DEMAURO, N. PAVLOVIC, AND** R. D. HIEBERT. 1990. Effects of anthropogenic disturbances on endangered and threatened plants at the Indiana Dunes National Lakeshore. Natural Areas Journal 10: 187-200.

   Populations of 81 endangered and threatened plants in the Indiana Dunes National Lakeshore were investigated and quantified during 1984-88. More than half of the populations occurred in naturally or anthropogenically disturbed habitats. The authors discuss different types of disturbance that affect these species and the history of fire in relation to *Habenaria* ***hookeri, Aristida tuberculosa, Polygonella articulata,*** *Hudsonia tomentosa, Selaginella rupestris,* and *Talinum rugosperma.* Fire or anthropogenic disturbance that mimics fire increased the survival of these species. Protection from tire led to the decline of fire-tolerant species of savanna, prairie, fen, and white pine communities.

Talinum rugosperma (C2)

10. BOYD, B. 1987. The effects of controlled burning on three rare plants. T. **Elias,** editor. Conservation and Management of Rare and Endangered Plants: proceedings from a conference of the California Native Plant Society held in Sacramento,



ida scrub endemic plant. In preparation.

recently. The greatest number of flowering stalks appeared on plots that were mowed and fertilized rather than burned, but both mowing and fertilizing alone also stimulated flowering. It appears that the persistence of cutthroat glades depends not only on the flammability of the grass limiting the encroachment of woody species but also on flowering stimulated by summer burns. [AA].

Panicum abscissum (C2)

67. OWEN, W. R., AND R. ROSENTRETER. 1992. Monitoring rare perennial plants: techniques for demographic studies. Natural Areas Journal 12:32–39.

Demographic monitoring of rare plant species is an essential component of an effective species management program. Traditional demographic techniques may fail to provide a clear view of the population processes of rare species because of statistical and logistical problems associated with small sample sizes, and because of the particular biological properties of rare perennial species. Managers need to be aware of these potential barriers to the interpretation of demographic data and know how to compensate through adjustments in their monitoring program. [AA].

68. PARKER, V. T. 1987. Effects of wet-season management bums on chaparral vegetation: implications for rare species. Pages 233-237 *in* T. Elias, editor. Conservation and Management of Rare and Endangered Plants. Proceedings from a conference of the California Native Plant Society, held in Sacramento, Calif., 5-8 November 1986.

Many chaparral species, including most rare and endangered chaparral species, depend on seed banks in the soil for recovery after fire. The author examines the effects of a prescribed bum in winter on the regeneration of several chaparral species, including *Arctostaphylos hookeri* ssp. *montanu.* Prescribed bums in Marin County, California, were studied for three growing seasons. Field and experimental data indicated decreasing germination of shrubs and herbaceous species after bums during winter. Parker recommended that the effects of prescribed bums during moist conditions on species regeneration should be carefully considered.

Arctostaphylos hookeri ssp. *montana (C2)*

69. PAVLIK, B. M. 1991. Reintroduction of *Amsinckia grandiflora* to three sites across its historic range. State of California, Department of Fish and Game, Endangered Plant Program, Sacramento, Calif. Unpublished.

Using methods developed on this and other endangered plants, Pavlik succeeded in creating a new, vigorous population of *Amsinckia grandiflora* within its historic range. An experimental design with demographic monitoring was used to test the effects of burning, hand clipping, and a grass-specific herbicide on the fates of 3,460 *A. grandifora* nutlets. The study concluded that new populations of *A. grandiflora* could be created in mesic annual grassland if the habitat is treated to minimizecompetition with annual grasses. [PA].

Amsinckia grandiflora (E)

70. PAVLIK, B. M., D. L. NICKRENT, AND A. M. HOWALD. 1993. The recovery of an endangered plant: creating a new population of *Amsinckia grandifora.* Conservation Biology 7:5 10-526.

Amsinckia

Lespedeza leptostachya (E), *Platanthera praeclara* (T)

81. SOBLO, D. *1994.* The Nature Conservancy, Columbia, S.C. Personal communication.

Fire is extremely important for *Oxypolis canbyi,* which occurs in habitat with a regular tire frequency. The Nature Conservancy observed an increase from fewer than 50 individuals to more than 200 after a hot wildfire in 1980. Since the

role of forest fires and logging in the reduction of suitable habitat on Mauna Kea, Hawaii.

Vicia menziessii (E)

102. U.S. FISH AND WILDLIFE SERVICE. 1985a. Determination of threatened status for *Ribes echinellum* (miccosukee gooseberry). Federal Register 50(133):29338-29341.

Known from Florida and South Carolina, *Ribes echinellum* exists only in two small populations. Because of its small numbers and narrow distribution, fires and other disturbances pose a significant threat to this species. Lightning fires are frequent in this region and threaten this taxa with extinction.

Ribes echinellum (T)

103. U.S. FISH AND WILDLIFE SERVICE. 1985b. Determination that *Amsinckia grandijlora* is an endangered species and designation of critical habitat. Federal Register 50(89): 19374-19377.

Amsinckia grandijlora occurs in grassland habitat in northern California. Controlled bums near *A. grandiflora* habitat may have adverse effects on the plant. The California Native Plant Society suggested that controlled bums may help suppress competing exotic species and may be beneficial to *A. grandiflora.*

Amsinckia

eliminate the species and its habitat. Management should include low-intensity disturbance such as prescribed bums but should exclude excessive disturbance.

Chrysopsis floridana is known only from Florida.

Chrysopsis floridana (E)

115. U.S. FISH AND WILDLIFE SERVICE. 1988d. Short's goldenrod recovery plan. U.S. Fish and Wildlife Service, Atlanta, Ga. Unpublished.

The historic range of *Solidugo shortii* may be related to the open habitat created by bisons *(Bison bison)* and by tire. Since settlement, secondary succession occurred in the absence of these types of natural disturbance. *Solidago shortii* habitat disappeared as a result of these changes in the vegetation and continues to be threatened by increased woody cover.

Solidago shortii is known only from Kentucky.

Solidago shortii (E)

116. U.S. FISH AND WILDLIFE SERVICE. 1989a. Alabama leather flower recovery plan. U.S. Fish and Wildlife Service, Jackson, Miss. Unpublished.

Clematis socialis occurs in natural and anthropogenic openings of a grass-sedge-rush community in northeastern Alabama. This species may benefit from limited disturbance, which creates an early successional stage or open habitat. Prescribed burning at a site that is managed by The Nature Conservancy in St. Clair

phlox) as endangered. Federal Register

recovery plan. U.S. Fish and Wildlife Service, Port-

Appendix B. Individuals, by region of the United States, who provided information about rare, threatened, and endangered plants in relation to fire.

Region

Geographic Index

Stenogyne

A list of current *Information and Technology Reports* follows:

1. Population Biology of the Florida Manatee, edited by Thomas J. O'Shea, Bruce **B.**

U.S. Department of the Interior
National Biological Service

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This responsibility includes fostering the sound use of our lands and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities.