ELEMENT STEWARDSHIP ABSTRACT
for

Rosa multiflora

Rambler Rose, Multiflowered Rose

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The Nature Conservancy
Element Stewardship Abstract
For *Rosa multiflora*

I. IDENTIFIERS

Common Name: RAMBLER ROSE Global Rank: G?

General Description:
Rosa multiflora is a perennial shrub with compound leaves and white to pinkish white flowers.

Diagnostic Characteristics:
Rosa multiflora may be told from R. setigera, which it resembles, by a more trailing or arching habit, mostly 7 or 9 leaflets, 2-4 cm long, abundant, mostly white flowers in a pyramidal inflorescence, a glabrous style, and smaller fruit (Fernald 1950).

II. STEWARDSHIP SUMMARY

Rosa multiflora is a concern on several preserve lands, notably in New Jersey and Indiana. It is considered a serious problem on old fields and agricultural land in many southeastern states. Monitoring should be conducted on preserves where it presents a potential problem, followed by active management if necessary. The most effective means of eradication seem to be cutting followed by herbicide application. Glyphosate is commonly used and can be effectively applied in a 1% V/V solution, or 0.5% V/V solution if a surfactant is added, applied directly to the plants, cut branches, or stumps. Spring applications should show increasing control over the season with complete residual control the following spring. Repeat applications may be necessary in subsequent years to prevent recurrences.

III. NATURAL HISTORY

Range:
Rosa multiflora is a common pasture weed in the northeastern and midwestern United States. It was originally introduced to the East Coast from Japan in 1886 as an understock for ornamental roses (Wyman 1949). It is no longer used among horticulturalists and is not available from nurseries (Doudrick 1987).

The present range of multiflora rose is throughout the U.S., with the exception of the Rocky Mountains, the Southeastern Coastal Plains, and the Nevada and California desert areas, although the plant does less well in the northern tier of states (Fawcett 1980).

Habitat:
Rosa multiflora grows best on deep, fertile, well-drained but moist uplands or bottomlands, but is capable of enduring a wide range of edaphic and environmental conditions (Wyman 1949, Steavenson 1946). Steavenson (1946) reported successful plantings even on the eroded clay pans of central Missouri and southern Illinois. Schery (1977) reported that multiflora rose endures shade or sun and damp or dry environments, but does not grow well in standing water.

Reproduction:
Rosa multiflora reproduces by seeds and by rooting at the tips of its drooping canes (Albaugh et al. 1977). Flowering begins in May, and the fruits develop in mid to late summer. The rose hips do not split apart to release the seed, but dry gradually to form a leathery capsule too dense to be wind-carried. The fruits are highly sought after by birds, especially the Cedar waxwing and American Robin (Scott 1965, Albaugh 1977, Barbour and Meade 1980). Birds are responsible for spreading the seeds, and as Schery (1977) noted, rose seedlings are often found under bird perch sites. Wyman (1940) observed better germination of seeds after scarification by passing through the digestive tract of birds. Uneaten rose hips remain on the

plant until the following spring (Fawcett 1980) and the seeds remain viable for a number of years (Wyman 1949).

The seeds germinate readily following deposition in the soil. Steavenson (1946) recommended cold stratification from Feb. 1 to April to people planting multiflora rose. Seedlings appear within 60 days at soil temperatures above freezing (Steavenson 1946). Seedlings are generally inconspicuous the first one or two years due to their low growth habit (Schery 1977).

Impacts:
In the 1930's, the U.S. Soil Conservation Service advocated the use of multiflora rose for soil erosion projects and as a "living fence" to confine livestock (Albaugh et al. 1977). Experimental plantings were conducted in Missouri and Illinois (Steavenson 1946), and as recently as the late 1960's state conservation departments in many states were giving away rooted cuttings to property owners (Schery 1977). Hedges of multiflora rose have also been used as a crash barrier and to reduce headlight glare in the medians of highways (Schery 1977, Hipkins et al. 1980). The plant is extremely prolific, however, and successfully invades pastures and other unplowed lands, crowding out existing vegetation and creating dense, impenetrable thickets. In some areas entire pastures have been taken over (Barbour and Meade 1980, Doudrick 1987). Cattle are often reluctant to enter fields dominated by multiflora rose (Fawcett 1980), and it has also been shown that rose hedges lower the crop yields on adjacent fields by competing for nutrients (Labisky and Anderson 1965).

IV. CONDITION

V. MANAGEMENT/MONITORING

Preserve Selection & Design Considerations:
Active control of multiflora rose is necessary mainly on agricultural land when it threatens to dominate pastures. It may also require management on preserve lands if found in old recovering pastures, as it can crowd out desirable grasses and other species.

Management Requirements:
Mechanical Control: Repeated mowing will control the spread of multiflora rose, particularly where the grass cover is dense (Scott 1965, Fawcett 1980). Fawcett (1980) stated that mowing several times a year would prevent multiflora rose seedlings from becoming established. At the Woodborne Santurary in Pennsylvania, annual mowing in July helped control the spread of multiflora rose, but did not eradicate it (Stone 1982). Mowing can be difficult due to terrain, when the hedges become established in wooded and brushy pastures. It is also difficult, if not impossible, to mow when the individual clumps reach their mature size, which may exceed 10 ft. in height by 20 ft. in diameter (Doudrick 1987).

Hand cutting of established clumps is difficult and time consuming. Fawcett (1980) recommended use of a bulldozer to knock down large rose clumps but cautioned that further control would be necessary due to resprouting and because seeds will be spread and germinate readily on the disturbed soil. At Woodborne, a large hedge cutter was used to top cut ten foot high rose clumps. Following this, annual mowing has prevented the re-establishment of large clumps and kept the field open (Stone 1982, Davison 1987).

Burning: Burning has not, apparently, been tried for multiflora rose. However, it has been tested in southeastern Texas as a management practice for Mccartney rose (Rosa bracteata), another exotic pasture species in the southern U.S. Gordon and Scifres (1977) tested head fires at 2 to 3 month intervals starting in February, 1975. Fire intensity and fuel components varied seasonally; however, regardless of the date of the burning, topkill of Mccartney rose was greater than 90%. Regrowth was initiated within two weeks after burns, again, regardless of the date of the burning. The average cane elongation was about 4 cm per month and canopy cover replacement averaged 10 to 15% per month following burning. Burning in winter effectively reduced the rose canopy for short-term gains in brush control, and allowed native grasses to take advantage of the entire spring growing period. There were higher herbage yields following

winter burns than other seasons. Scifres (1982) believes that multiflora rose response to burning would be similar.

Prescribed burning in combination with herbicides has also been evaluated for Mccartney rose in southeast Texas. Scifres (1975) found that mechanical methods such as raking and stacking were effective for initial removal of mature, dense and ungrazed stands of the rose, allowing access for subsequent treatment. Prescribed burning removes the debris that remained after spraying and should reduce live Mccartney rose top growth by 75%. Periodic burning or respraying is probably necessary to prevent re-invasion of the rose (Scifres 1975).

Biological Control: The European Rose chalicid, Megastigmus aculeatus Swederus (Hymenoptera:Torymida), and rose rossette disease are potential biological control agents for multiflora rose.

M. aculeatus is a phytophagous wasp. The life cycle and distribution in North America has been summarized by Milliron (1949) and Balduf (1959). The adults are minute, weak flyers of limited lifespan. In May and June the long terebras of the female ovipositor pierces the still soft achene and deposits one egg in the soft, pulpy seed. The larvae subsequently develop during June and July, and consume the entire contents of the seed. After full growth in mid to late summer, the larvae undergo a long diapause and overwinter inside the now seedless achene. Pupation occurs in late April to June, and the adult emerges from the rose hip in early summer to renew the cycle. Populations are heavily female in number, suggesting that the majority of reproduction is parthenogenetic (Milliron 1949, Balduf 1959).

It is important to note that M. aculeatus adults are limited fliers, and do not appear to disseminate even locally through their own powers of flight (Balduf 1959). Their spread is dependent upon the use of rose seed, which explains the presence of these insects in nurseries on the East coast, where imported rose seed was used to start root stocks. Subsequent plantings, however, were done vegetatively, far from the nurseries where the plants were grown. It is possible that some of the large-scale plantings of multiflora rose throughout the Midwest are isolated from their chalicid limiting agent (Scott 19865). If true, this suggests that local reintroductions of M. aculeatus could be an effective control method for multiflora rose.

The rose rosette disease is another potential biocontrol agent for R. multiflora. Characteristic symptoms of the disease include abnormal floral development, a "witches broom" effect, and reddening of leaves and shoots (Doudrick et al. 1986). It was originally reported on wild native roses in the northwestern United States and Canada (Thomas and Scott 1953), and first showed up on multiflora rose at a Nebraska nursery in 1964 (Doudrick 1987). By the 1980's, rose rosette was widespread on multiflora rose in Kansas and Missouri (Crowe 1963), and the rose industry became concerned about the spread of the disease to ornamental roses. It is apparently spreading eastward and was first reported east of the Mississippi in southern Indiana and northern Kentucky in 1987 (Hindal et al. 1987). The disease is lethal to all roses, and Doudrick (1987) and Hindal (1987) reported the occurrence of entire fields in Missouri dominated by multiflora rose where 80-90% of the plants were dead or dying. However, the causal agent of the disease is unknown, and it is considered unsafe for use in a control management program for multiflora rose because of the potential threat to ornamental roses. Doudrick (1987) believed that the disease may have reached equilibrium status in Missouri, and that multiflora rose may begin to "bounce back" (i.e., most of the non-resistant genomes of R. multiflora have been attacked, leaving the more resistant ones). The natural spread of the disease may eliminate the need for active control of multiflora rose in some areas.

Chemical control: Plant growth regulators have been used to control multiflora rose in southwestern Virginia where it has been used as a safety barrier along highways. Of the four regulators tested in Spring 1977, chlorflurenol, maleic hydrazine, and MBR- 18337 effectively prevented fruit set and subsequent spread. The fourth regulator, gyloxime, did not give adequate control although it caused some fruit abscission after fruit set (Hipkins et al. 1980).

Various herbicides have been tested and found effective for control of multiflora rose. It is important to note that multiflora rose has the typical regenerative power of members of the rose family (Scott 1965), and control programs must be monitored and followed up if necessary by repeated herbicide application or used in conjunction with other control methods such as mowing or burning.

Glyphosate is effective against multiflora rose in a 1-2% V/V solution (Ahrens 1977, Lynn et al. 1979, Barbour and Meade 1980, Albaugh et al. 1977, Sherrick and Holt 1977, Fawcett et al. 1977). Although Reed and Fitzgerald (1979) reported glyphosate to be relatively ineffective, giving 25-75% stem kill over one season after a spring application, they did not follow-up their results to check for residual control the following year. Lynn et al. (1979) reported that a spring glyphosate treatment on R. multiflora showed increasing control over the growing season to complete control by the following spring. Treatments in the fall showed no results until the following spring, when effective control was realized (Lynn et al. 1979). Ahrens (1977) reported almost complete control of multiflora rose by the end of the second growing season after a late June application of either 1.5 or 3.0 lb/100 gal glyphosate, and noted that grasses growing underneath the roses were unaffected indicating that the spray on the rose overstory did not penetrate to the ground. Albaugh et al. (1977) found that the rate of application of glyphosate could be reduced to a 0.5% V/V solution for effective control with the addition of a surfactant.

2,4-D, and picloram also give excellent control of multiflora rose (Sherrick and Holt 1977, Fawcett et al. 1977, Reed and Fitzgerald 1979). Sherrick and Holt (1977) reported 2,4-D plus picloram, or picloram alone were also effective (all as foliar sprays). Picloram was found to be relatively ineffective as a soil application. Reed and Fitzgerald (1979) also found erratic results using picloram in pellet form (soil application), with stem kills ranging from 25-100% over one growing season (they did not look for the effects of residual control the following spring, however). Barbour and Meade (1980) reported picloram pellets to be effective, studied over a three- year period, at 2,4, or 5 lb/A.

Other foliar sprays found to be effective against multiflora rose include dicamba (Sherrick and Holt 1977, Fawcett et al. 1979), triclopyr (Sherrick and Holt 1977, Reed and Fitzgerald 1970) and fosamine (Kmetz 1978, Ahrens 1979). Fosamine controls only woody species and is non-volatile, and may be suitable in situations where there is concern to protect herbaceous species (Fawcett 1982). Pelleted and granular treatments found adequate include tebuthiuron (Lynn et al. 1978, Link et al. 1981) while dicamba was not found adequate (Sherrick and Holt 1977, Fawcett et al. 1977, Ahrens 1977, Barbour and Meade 1980).

Management Programs:
Multiflora rose has been declared a noxious weed in many states, including Kansas, Iowa, Missouri, Ohio, Pennsylvania, and West Virgina. It is mainly a threat to agricultural land, but has been reported to be a concern on at least two TNC preserves: the Spinn Prairie in Indiana and the Eldora Nature Preserve in New Jersey.

On the Spinn Prairie it occurs in small patches and monitoring may be necessary to determine if active control is necessary (Heitlinger 1987, McGrath 1987). At the Eldora Nature Preserve it is reportedly taking over old fields and there is concern about loss of habitat for some native moth species that feed on grasses in these areas (Davison 1987). No monitoring or management of multiflora rose has taken place at Eldora, but active control measures are considered necessary (Davison 1987).

Contact: Stewardship Director, The Nature Conservancy, Pennsylvania Field Office, 1218 Chestnut St., Suite 807, Philadelphia, PA 19107. (215) 925-1065.

Denny McGrath, Assistant Director, The Nature Conservancy, Indiana Field Office, 4200 N. Michigan Road, Indianapolis, IN 46208. (317) 923-7547.

A number of states where multiflora rose is a problem on agricultural land have cost share eradication programs whereby landowners can be reimbursed for a portion of the costs to control the plant on their property. These programs may also be available for preserve areas.

Contact: Iowa. Secretary of Agriculture, Iowa Dept. of Ag. and Land Stewardship, Wallace State Office Bldg, Des Moines, IA 50319.

Ohio. Larry Vance (614) 265-6610. Larry Summers (614) 265-6684. Ohio DNR. Div. of Soil & water Conservation, Fountain Square Bldg. E-2, Columbus, OH 43224.

Monitoring Requirements:
Monitoring should be conducted on preserve land where multiflora rose presents a potential management concern to determine changes in area occupied and density; also to track changes where control measures are being implemented.

Populations can be monitored with aerial photography and field measurements of abundance and density. Continuous monitoring over a period of several years may be necessary to check for the spread of small clumps and/or recurrences after implementation of control measures.

Monitoring Programs:
Heitlinger (1987) suggested monitoring of multiflora rose through the use of line intercept transects at the Spinn Prairie in Indiana to track its density and contraction/expansion. Contact: Denny McGrath, Ass't. Director, Indiana Field Office, The Nature Conservancy, 4200 N. Michigan Road, Indianapolis, IN 46208 (317) 923-7547.

VI. RESEARCH

Management Research Programs:
Research is currently being conducted at West Virginia University on rose rosette as a control for multiflora rose. Contact:

Dr. Dale Hindal, Division of Plant & Soil Sciences, Dept. of Plant Pathology and Agricultural Microbiology, 401 Brooks Hall, West Virginia University, Morgantown, WV 26506. (304) 293-3911.

Dr. James Amrine, Dept. of Entomolgy, West Virginia University, Morgantown, WV 26506. (304) 293-6023.

Management Research Needs:
Further research is needed in the area of biological control for multiflora rose. Both the phytophagous wasp Megastimus aculeatus and the Rose Rosette disease are potential biological control agents (see Management Procedures), but also represent a potential threat to ornamental roses.

In the case of M. aculeatus, the degree of host specificity is not fully understood. Milliron (1949) recognized two varieties of the wasp: a "light form" (M. aculeatus aculeatus) and a "dark form" (M. aculeatus nigroflavus). Milliron believed the dark form to be host specific on multiflora rose. However, Balduf (1959) recovered M. aculeatus nigroflavus from Rosa eglanteria and R. virginiana, both native roses. No further research has been conducted on M. aculeatus host specificity. A more promising control agent is the rose rosette disease. However, research to determine the causal agent of the disease has met with little success. Transmission of the disease is accomplished by an eriophyid mite, Phyllocoptes fructiphilus (Amrine et al. 1987). Symptoms of rose rosette, such as the witches broom and reddening of leaves, suggest a mycoplasma- like organism (MLO) as the causal agent, but the mite mouthpart (a sucking tube) is too small to suck up an MLO and also does not penetrate the phloem where an MLO would be found (Doudrick 1987). Other characteristics suggest a viral causal agent, but Doudrick et al. (1987) were unable to find anything resembling viral particles associated with diseased plants. Until more is known about the cause of rose rosette, it probably will not be employed in management programs for control of multiflora rose due to the threat to ornamental roses.

Other questions that may aid management of multiflora rose if carefully researched include the following. What are the germination requirements of multiflora rose and under what conditions are seeds least likely to germinate? How persistent is the rose in recovering grasslands that are no longer grazed? What are the effects of fire on seed viability and vegetative reproduction? How effective is fire in conjunction with herbicides or other control methods?

VII. ADDITIONAL TOPICS

VIII. INFORMATION SOURCES

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IX. DOCUMENT PREPARATION & MAINTENANCE

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