# NATURALIZED AUTUMN OLIVE IN ILLINOIS

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## ABSTRACT

*Elaeagnus umbellata* Thunb. (Autumn Olive) has become naturalized at many localities in east-central Illinois. Numerous individuals were found at many sites with the plants ranging in size from small seedlings to shrubs over 2 m tall. Three of these sites were studied in detail and the number of Autumn Olive plants per hectare ranged from 5,225 to 33,975 individuals.

## INTRODUCTION

Within the past few years there has been increased concern over the introduction of non-native species. Henry and Scott (1980) indicate that since 1846 there has been a dramatic increase in the number of alien species in the Illinois vascular flora, and that these taxa now constitute about 29% of the plant species known to occur in the state.

A recently introduced non-native species that appears to have the potential of becoming naturalized and developing into a major plant pest is *Elaeagnus umbellata* Thunb. This taxon, which is native to Japan, China, and Korea (Bailey, 1949), is now commonly planted to provide cover and supplementary food for game and non-game birds as well as other wildlife. This species has been studied since 1940 by the Soil Conservation Service's National Plant Materials Center in Beltsville, Maryland, and the strain 'Cardinal' was released in 1963 for commercial production (Foose, 1974).

*Elaeagnus umbellata* was not listed by Jones (1963), indicating that it was not recognized as an adventive in Illinois at that time. Later, Myers (1972) considered this species as adventive or spontaneous in Illinois, but not naturalized and a part of the flora, while Mohlenbrock (1975) mentions that it rarely escapes from cultivation and reports it from Williamson County, Illinois. Mohlenbrock and Ladd (1978) also list this species from only Williamson County, while Shildneck, Jones, and Muhlenback (1981) report it from Vermilion County. Recently the present authors have found naturalized stands at more than 15 localities in Coles, Clark, and Vermilion Counties. As a result, a study was undertaken to determine the population density of Autumn Olive at some of these sites, and to determine the type of habitats it will colonize.

## MATERIALS AND METHODS

Three sites were studied to determine the extent to which Autumn Olive is becoming naturalized. At these sites a 20 by 20 m area was located between 25

and 75 m of an Autumn Olive planting and then divided into 2½ by 2½ m plots. In each plot the Autumn Olive plants found were counted and classified as to seedlings and one-year old plants (less than 5 dm tall), or two-year or older plants (more than 5 dm tall). From these data the % frequency (plots of occurrence) and density (individuals per hectare) were calculated.

## RESULTS AND DISCUSSION

'Cardinal' Autumn Olive was first planted in east-central Illinois during the early 1970's. Though not usually considered to spread extensively from cultivation (Allan and Steiner, 1972), it has recently been found to occupy a number of habitats near the original plantings. Listed below are the three areas which were studied along with a description of each area and the frequency and density of Autumn Olive at each site.

*Site # 1.* Located on the south edge of Charleston, Coles County, Illinois (Sec 22 T12N R9E). At this site a small pine plantation had a Autumn Olive hedge planted along its east boundary in 1975. Until 1980 this area had been mowed, and the pines are now between 1 and 2 m tall. A total of 209 Autumn Olive plants were found in the 20 by 20 m area with nearly 30% being more than 5 dm tall. Here Autumn Olive frequency is 70%, averaging 5,225 stems per hectare.

*Site # 2.* Located 3 miles west of Charleston, Coles County, Illinois (Sec 18 T12N R9E). At this site a field dominated by a thick sand of *Bromus inermis* Leyss. (Awnless Brome Grass) had an Autumn Olive hedge planted along its north and west boundaries in 1975. Small ravines, which are in the early tree stage of succession, occur in this field. These ravines contain scattered individuals of *Juglans nigra* L., *Malus ioensis* (Wood) Britt., *Quercus imbricaria* Michx., *Q. rubra* L., *Prunus serotina* Ehrh., and *Ulmus americana* L. that are mostly less than 10 cm dbh. One of these ravines was surveyed using a 20 by 20 m area, and 1,359 Autumn Olive plants were found with about 20% being more than 5 dm tall. On this site Autumn Olive has a frequency of 86% and averages 33,975 stems per hectare.

*Site # 3.* Located on the William Weiler farm 5 miles east of Charleston, Coles County, Illinois (Sec 4 T12N R10E). This site is located in a grazed upland forest at the edge of a small pond. The forest is dominated by *Quercus alba* L. with most of the trees 3-5 dm dbh. Autumn Olive was planted along the north edge of the pond in 1974. A total of 1,100 Autumn Olive plants were found in the 20 by 20 m area with 7% being more than 5 dm tall. At this site Autumn Olive has a frequency of 97%, and averages 27,500 stems per hectare.

The above results indicate that *Elaeagnus umbellata* is becoming naturalized in east-central Illinois, and possibly thoughout most of the state. Though present evidence shows that this taxon spreads into disturbed habitats, it has the potential to spread also into natural areas. Therefore, indiscriminate planting of this non-native species into areas which are essentially "wild" and usually unmanaged, is biologically unsound.

## LITERATURE CITED

Allan, P. F. and W. W. Steiner. 1972. Autumn Olive for wildlife and other conservation uses. U. S. Dept. Agric. Leaflet No. 458:1-8.

Bailey, L. H. 1949. Manual of cultivated plants. Revised Ed. The MacMillan Co., New York.

Foose, D. R. 1974. Center focuses on conservation plants. Soil Conservation 40(2):4-5.
Henry, R. D. and A. R. Scott. 1980. Some aspects of the alien component of the spontaneous Illinois vascular flora. Trans. Ill. St. Acad. Sci. 73(4):35-40.
Jones, G. N. 1963. Flora of Illinois. 3rd Ed. Amer. Midl. Nat. Monogr. 7:vi + 401.
Mohlenbrock, R. H. 1975. Guide to the vascular flora of Illinois. Southern Illinois University Press, Carbondale and Edwardsville.
Mohlenbrock, R. H. and D. M. Ladd. 1978. Distribution of Illinois vascular plants. Southern Illinois University Press, Carbondale and Edwardsville.
Myers, R. M. 1972. Annotated catalog and index for the Illinois flora. Western Illinois University Ser. Biol. Sci. 10:1-64.
Shildneck, P., A. G. Jones, and V. Muhlenback. 1981. Additions to the vouchered records of Illinois plants and a note on the occurrence of *Rumex cristatus* in North America. Phytologia 47:265-290.