

FY 2009 Progress Report Project ID: 08-1-2-07

Title: Prescribing Fire in Managed Oak Forest Landscapes: Interactions with the Invasive Tree *Ailanthus Altissima*

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Objective 1. *Distribution of Ailanthus in relation to fire and other factors.*

Field data collection, data entry and management was completed. Aerially-identified patches with seed-producing trees are being incorporated into a GIS that already has multiple layers for the study area, including soils, 10-m digital elevation model, Integrated Moisture Index (Iverson et al. 1997), fire management, imagery, and other landscape features.

Preliminary model development was initiated utilizing ArcGIS and tree regression analysis techniques to determine the relationships of *Ailanthus* presence and abundance distance and direction from seed-producing trees and skid roads, fire (intensity, season of burn, years from burn), timber harvest, soil attributes (e.g. moisture, chemistry), and site factors (e.g. photosynthetically active radiation, slope, aspect).

Objective 2: Direct effects of fire and herbicide on the demography of *Ailanthus*

Prescribed burns and herbicide treatments were completed in the factorial study to study the direct effects of fire and herbicide on *Ailanthus* populations in which the short-term demography (births, deaths, etc). The following treatments were studied: (1) no burn/no herbicide (control); (2) burn/no herbicide; (3) no burn/herbicide; and (4) burn+herbicide.

Herbicide treatments via stem injections (hack and squirt) were completed in September 2009. Imazapyr was used to treat all *Ailanthus* stems. Herbicide efficacy was evaluated in summer 2010. Preliminary review of evaluations indicate herbicide treatments were extremely effective (>99% of *Ailanthus* stems were killed, but limited sprouting was observed).

Prescribed fires were conducted on three separate units on April 05, 13, and 14, 2010 within the study area. The ODNR Division of Forestry conducted

the prescribed burns on 650 acres with fire-line assistance by Forest Service scientists and technicians. Maximum probe temperatures during the prescribed burns averaged 151 C.

Post-treatment data on *Ailanthus* populations were collected in summer 2010. All *Ailanthus* saplings and trees that were mapped and tagged within each 10-m radius plot in 2009 were evaluated. Seedlings and small saplings were counted within four 2-m wide belt-transects within each plot. A total of 21 plots were installed in units to be burned and 18 plots in control units. All *Ailanthus* stems (germinants to adult overstory trees within each of the 39 experimental treatment plots were evaluated in summer 2010.

Variables measured in 2010:

1. Tagged *Ailanthus* stems within 10-m radius plots:
 - mortal status
 - tree vigor
 - evidence of tree char or scorch
 - basal sprouts (counts, vigor, ht of tallest, competition on tallest)
 - evaluation of herbicide treatment
 - presence of ambrosia beetles
 - root sprouts
 - evaluation of 1-m radius area surrounding each tagged *Ailanthus* stem
2. 2m-wide belt transects (16 m² each) to tally and age *Ailanthus* seedlings and sprouts.

The field data collected in 2010 is currently being entered electronically for data analyses during FY2011.

Invited and offered presentations were made at: The International Fire Congress, The Interagency Invasives Research Forum, and The Ohio Invasive Plant Council Research Conference.

Technology Transfer:

The ONDR Division of Forestry has adopted this newly developed helicopter survey technique to locate and geo-reference *Ailanthus* and other woody exotic invasives within Ohio State Forests. These mapped trees were chemically treated by newly hired staff with federal stimulus dollars through the Ohio Woodlands Job Corp Program in summer.

The Wayne National Forest will begin utilizing the helicopter survey technique in cooperation with the ONDR Division of Forestry and Northern Research Station in FY2011 to to locate and geo-reference *Ailanthus* and other woody exotic invasives within the boundaries of the WNF. Data collected will be used to develop and prioritize treatment plans for chemical control.

