

**TITLE: Determining the extent and severity of *Ailanthus*, an invasive tree affecting Oak Forest Restoration in Appalachia Ohio.**

**LOCATION:** USFS Eastern Region, Forestlands of Southeastern (Appalachia) Ohio

**DATE:** October 12, 2010 (original submission)

**DURATION:** Year 1 of 2-year project (2011-2012)     **FUNDING SOURCE:** Fire Plan

**PROJECT LEADER:** Cheryl Coon, Wayne National Forest, 740-753-0558, ccoon@fs.fed.us

**COOPERATORS:** Dan Balsler, Forest Health, Ohio Division of Forestry

Joanne Rebbeck, Plant Physiologist, Northern Research Station

**FHP CONTACT:** Jim Steinman, Newtown Square, PA, 610-557-4158, jsteinman@fs.fed.us

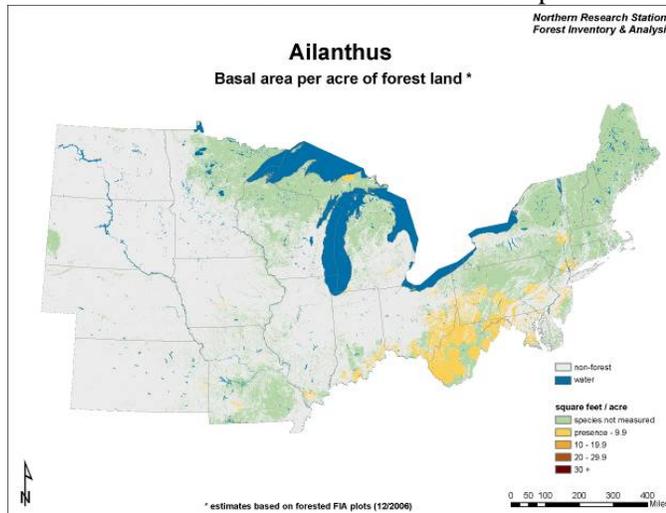
**PROJECT OBJECTIVES:**

- 1) Identify and map reproducing *Ailanthus* trees across multiple ownerships in SE Ohio.
- 2) Target treatment of *Ailanthus* in and near proposed prescribed fire treatments.
- 3) Increase effectiveness of burns to restore oak ecosystems by removing *Ailanthus*, a direct competitor.
- 4) Increase impact: provide *Ailanthus* maps to groups working with private landowners (NRCS, ODOF).

**JUSTIFICATION:**

**a. Linkage to FHM/FIA:**

Figure 1: FIA 2006 estimates of *Ailanthus* basal area per acre of forest.



A comparison of Wayne NF data (FIA 1991 vs. 2003-2008) shows the percent of *Ailanthus* in forests has increased by almost one percent (0.7% vs. 1.6% of 5 inch or greater dbh trees) in a little over a decade. The rapid spread of *Ailanthus* is altering ecosystems in southeast Ohio: a single tree can produce 350,000 seeds per year (Pannell 2002). Without action, *Ailanthus* will increase **exponentially** in percentage of forest composition in Appalachia Ohio forests.

**b. Significance in terms of the geographic scale:**

The Appalachian Ecosystem contains the oldest and most diverse forests in North America. SE Ohio is in the unglaciated Western Allegheny Plateau, Appalachia Ohio, where *Ailanthus* is increasing in density (Fig.1). Mapping efforts will target over 12 counties encompassed by Wayne NF and Ohio State Forests. Of Ohio forests, 12% are public lands, the remainder is privately owned. This ownership pattern requires a concerted effort to manage across boundaries at a landscape scale.

**c. Biological impact and/or political importance of the issue;**

Concern is growing about future sustainability of oaks in the oak/hickory forests of the Northern U.S. Oaks serve as keystone species in forests by providing a community structure and environment that maintains critical processes (Fralish 2004). Their hard mast is vital to wildlife, the wood is important for the forest products industry and they are more adaptable to future climate change (NRS 2009). *Ailanthus* competes directly with oaks and represents a barrier to the reintroduction of fire since it is adapted to and benefits from the disturbance (Hutchinson, 2004, Rebbeck 2008). *Ailanthus* lowers the function and resilience of forest ecosystems.

**d. Scientific Basis/Feasibility**

The methodology for aerial mapping of *Ailanthus* was developed and used by the Ohio Division of Forestry (ODOF). The Wayne NF and ODOF will do surveys of *Ailanthus* this winter (2010) through an agreement. Proposed mapping in 2011-2012 will build on this agreement, ensuring accomplishment within the proposed time frames.

**e. Priority Issues**

Oak systems are adapted to fire as a key disturbance factor for regeneration and ecosystem viability. Barriers to returning fire to the landscape include land fragmentation, changes in forest structure and species composition, and the present of invasive species like *Ailanthus*. All of these threats must be addressed, but the threat of *Ailanthus* is most urgent and must be addressed before the window of opportunity is lost. Eradication of *Ailanthus* will improve opportunities for using prescribed fire as a restoration tool and increase the function and resiliency of oak forests to future climate change.

**DESCRIPTION:**

**a. Background:** Ohio's forests are currently at a crossroads. Historical fire regimes have been interrupted. The dominant oak systems are declining and gradually being replaced by more shade-tolerant and fire-sensitive trees. Forest health is being impacted by non-native invasive plant and insect species. Without an ecosystem approach to restoration, forest composition will continue to shift away from oak-hickory, invasive species will occupy more of the landscape, biological diversity will continue to be lost and forests will lose their resiliency and ability to respond to climate change. *Ailanthus altissima* (tree-of-heaven), an aggressive invasive tree, can invade and expand dramatically when forests are disturbed. It invades disturbed habitat via abundant wind-dispersed seed and it can persist and expand by clonal growth. Oak forests of the Appalachians require fire disturbance to restore and maintain their ecological function, however *Ailanthus* is present in many oak forest landscapes. The Wayne NF identified sustaining oak forests as a primary objective in its Forest Management Plan.

In partnership with the Ohio Division of Forestry (ODOF), WNF is working to eradicate *Ailanthus* from Appalachia Ohio. The *Ailanthus* objectives are to: 1) aurally map reproducing populations (female trees) and 2) use these maps to prioritize invasive control treatments in conjunction with restoration treatments. The desired outcome is to eliminate reproducing *Ailanthus* stands and other underlying invasive species on public lands. Invasive treatments will be coordinated "across the fence" with willing private landowners implementing Forest Stewardship Plans in association with NRCS.

**b. Methods:** Aerial mapping will be done by ODOF through a multi-year Challenge Cost Share agreement. The mapping will be done using digital aerial sketch mapping (DASM) from a helicopter, a proven technique that ODOF uses for large-scale surveys of forest health. Aerial mapping will occur in fall and winter months, after leaf drop, so that aerial observers are able to identify the seed-producing *Ailanthus* females. Prominent *Ailanthus* seed clusters persist through the winter and are easily identifiable in aerial surveys.

**c. Products:**

- Reproducing stands of *Ailanthus* mapped across 160,000 acres of Appalachia Ohio.
- GIS maps of *Ailanthus* created for all ownerships to prioritize *Ailanthus* treatments.
- Maps of *Ailanthus* shared with NRCS and ODOF to help identify private land owners in need of assistance writing Forest Stewardship plans to secure public funds.

**d. Schedule of Activities:**

- Oct– Dec 2011: Aerial mapping of 80,000 acres on Ironton Ranger District. The area will include the landscape silviculture/fire project (Buckeye). NEPA: 2011-2012
- Oct – Dec 2012: Aerial mapping of 80,000 acres on Athens Ranger District around future planned project (Baileys) for landscape silviculture/fire. NEPA: 2012-2013.

**e. Progress/Accomplishments:**

This is an initial proposal; there are no progress reports at this time. Currently ODOF and WNF are completing an agreement for 2010 fall/winter surveys of 80,000 acres.

**COSTS:**

Year 2011	Item	Requested FHM EM Funds	Other-Source Funds	Source
<b>Administration</b>				
	Salary ODOF Staff (surveys) \$30/hr for 3 weeks		5,040	ODOF
	Salary WNF staff – coordination and oversight \$330/day for 10 days		3,300	WNF
<b>Procurements</b>				
	Helicopter time for 3 weeks of aerial surveys (map 80,000 acres)	35,000	35,000	ODOF
<b>Total</b>		35,000	43,340	

Year 2012	Item	Requested FHM EM Funds	Other-Source Funds	Source
<b>Administration</b>				
	Salary ODOF Staff (surveys) \$30/hr for 3 weeks		5,040	ODOF
	Salary WNF staff – coordination and oversight \$330/day for 10 days		3,300	WNF
<b>Procurements</b>				
	Helicopter time for 3 weeks of aerial surveys (map 80,000 acres)	35,000	35,000	ODOF
<b>Total</b>		35,000	43,340	

**Literature Cited**

**Fralish, J.S. 2004.** The keystone role of oak and hickory in the central hardwood forest. In; Spetich, Martin A., ed. Upland oak ecology symposium: history, current conditions, and sustainability. Gen. Tech. Rep. SRS-73. USDA, USFS, Southern Research Station: 78-87.

**Hutchinson, T., J. Rebbeck, R. Long. 2004.** Abundant establishment of *Ailanthus altissima* after restoration treatments in an upland oak forest. *Proceedings of the 14<sup>th</sup> Central Hardwood Forest Conference.* GTR-NE-316. p. 514.

**Rebbeck J., T.Hutchinson, D.Yaussy, I.Iverson, 2008.** Prescribing fire in managed oak forest landscapes: interactions with the invasive tree *Ailanthus altissima*. Joint Fire Science Program Project number: 08-1-2-07. [http://nrs.fs.fed.us/units/sustainingforests/local-resources/docs/REBBECK\\_JFSP\\_study%20plan.pdf](http://nrs.fs.fed.us/units/sustainingforests/local-resources/docs/REBBECK_JFSP_study%20plan.pdf)

**NRS (Northern Research Station) 2009.** Ohio Forests 2006. Resource Bulletin NRS-36. USDA, Forest Service, Northern Research Station: 62.

**Pannell, P.D. 2002.** Tree-of-heaven control. Maryland Department of Natural Resources Forest Service Stewardship Bulletin, Hagerstown, MD.