

# Hemlock Conservation Plan

A plan for conserving eastern hemlock in  
Pennsylvania

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EMAC

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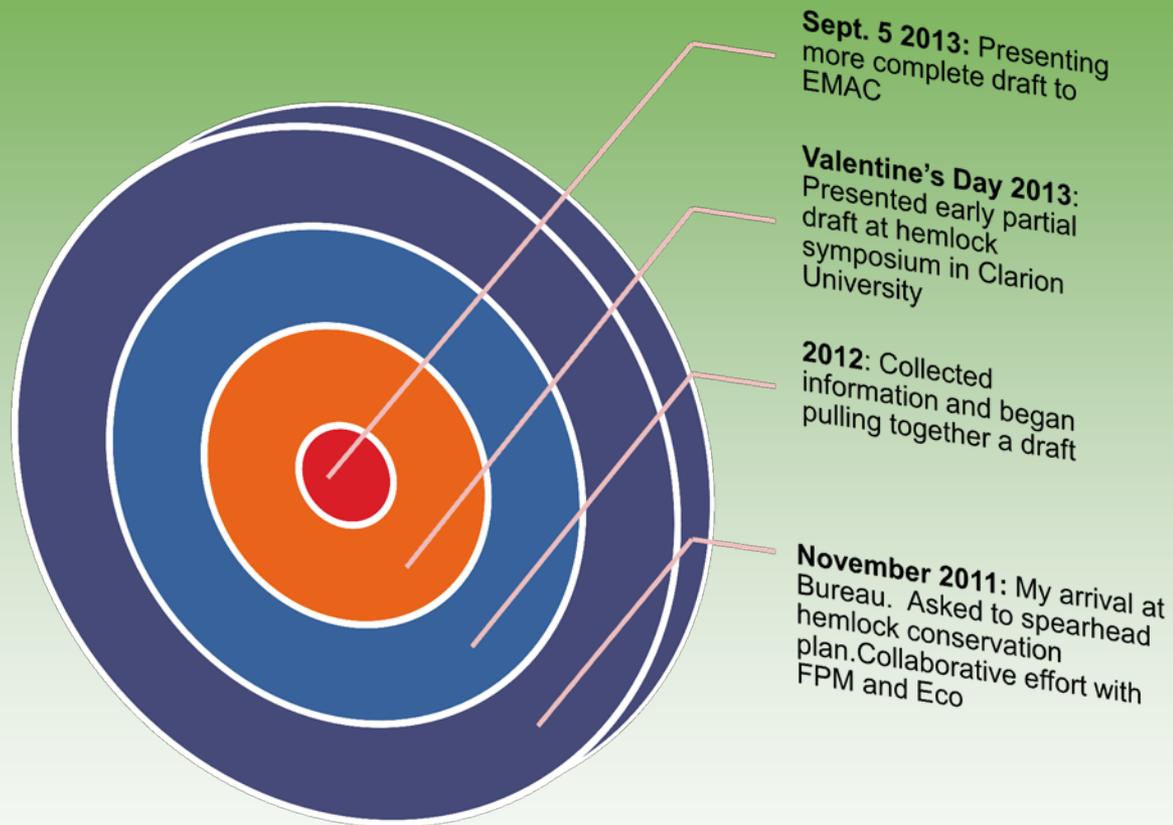
# Why did we develop this plan?

It fits our mission: Ensure the long-term health, viability and productivity of the Commonwealth's forests and to conserve native wild plants.

It addresses several key Bureau functions



# History and Timeline of Hemlock Conservation Plan



# Purpose of Plan:

To develop and implement management objectives focused on preserving eastern hemlock in Pennsylvania.

Was written for public and private landowners alike.

Intended to be accessible to anyone regardless of education level or background.



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Plan is divided into four main sections:



## Eastern Hemlock

- biology
- life history
- ecological, economic, cultural significance



## Stressors, Threats & Control Tools

- Abiotic
- Biotic
- Control tools

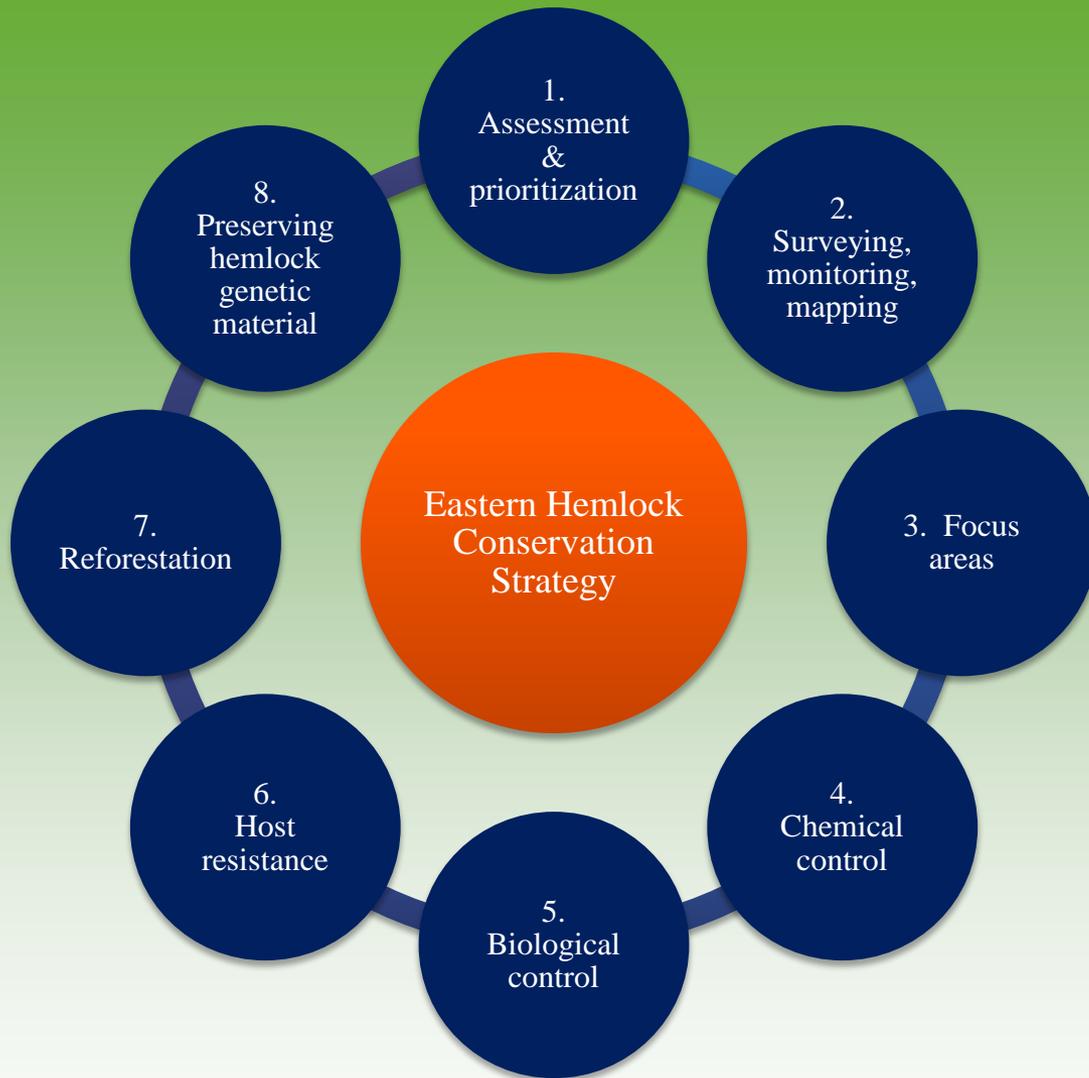


## Conservation Strategy

- 8 pronged approach



## Implementation Strategy



# Conservation Strategy

## 1. Assessment and Prioritization of Sites:

- Perform landscape level hemlock assessments
- Determine extent and health of hemlock on property
- Assess sites and prioritize them for treatment

### Low Priority Sites:

- a) Sites with heavy HWA induced mortality or decline ( $\geq 50\%$  needle loss)
- b) Hemlocks growing on sites that they are not well suited for (e.g., water logged or drought prone)
- c) Sites not easily accessible for treatment

High Priority Sites: (depends on landowner objectives)

I. Ecological Objective

- a) Old growth present
- b) Habitat for endangered or threatened species
- c) Hemlocks shading EV streams
- d) Hemlocks shading cold water fisheries
- e) Hemlocks in riparian areas

II. Aesthetic / Recreational

- a) Old growth present
- b) Hemlocks of historic significance
- c) Highly visited areas
- d) Close proximity to hiking trail
- e) Close proximity to campground or other tourism

III. Areas outside of known infestation range of hemlock woolly adelgid

## 2. Surveying, monitoring, mapping

### Public land strategy

- a) (*Permanent plots*)
- b) (*General hemlock surveys*)

### Private land strategy

- a) Inspect annually Jan-March
- b) Presence/Absence HWA
- c) Determine proportion of infested branches
- d) Set threshold for treatments



## 3. Focus Areas

- I. Cook Forest State Park
- II. Tionesta Scenic & Research Areas
- III. Heart's Content Scenic Area
- IV. Snyder Middleswarth Natural Area
- V. **Detweiler Run Natural Area**
- VI. Alan Seeger Natural Area
- VII. Bear Meadows

4. **Chemical Control:** pockets of designated hemlocks treated with insecticides until longer term solution developed

- a) imidacloprid
- b) dinotefuran

Utah State University Cooperative Extension



[www.forestryimages.org](http://www.forestryimages.org)

5. **Biological Control:**

- a) *Scymnus camptodromus*
- b) *Laricobius nigrinus*



6. **Host Resistance:**

- a) Identify any hemlocks that appear resistant to HWA
- b) Contact Alliance for Saving Threatened Forests



[www.dcnr.state.pa.us](http://www.dcnr.state.pa.us)



## 7. Reforestation:

- a) Remove dying or heavily damaged hemlocks ( $\geq 50\%$  defoliation)
- b) Promote conditions favoring establishment of desired tree species already on site
- c) If conifer presence still desired, promote conditions favorable for establishment of conifers already on site, and supplement with plantings of appropriately adapted species

## 8. Preservation of hemlock genetic material: The Bureau has aided Camcore to collect eastern hemlock seeds from Pennsylvania

Camcore currently has four of these gene conservation programs ongoing: eastern hemlock, Carolina hemlock, table mountain pine, Atlantic white cedar

# Implementation of Strategy

Designed a matrix describing each strategic goal with the following columns:

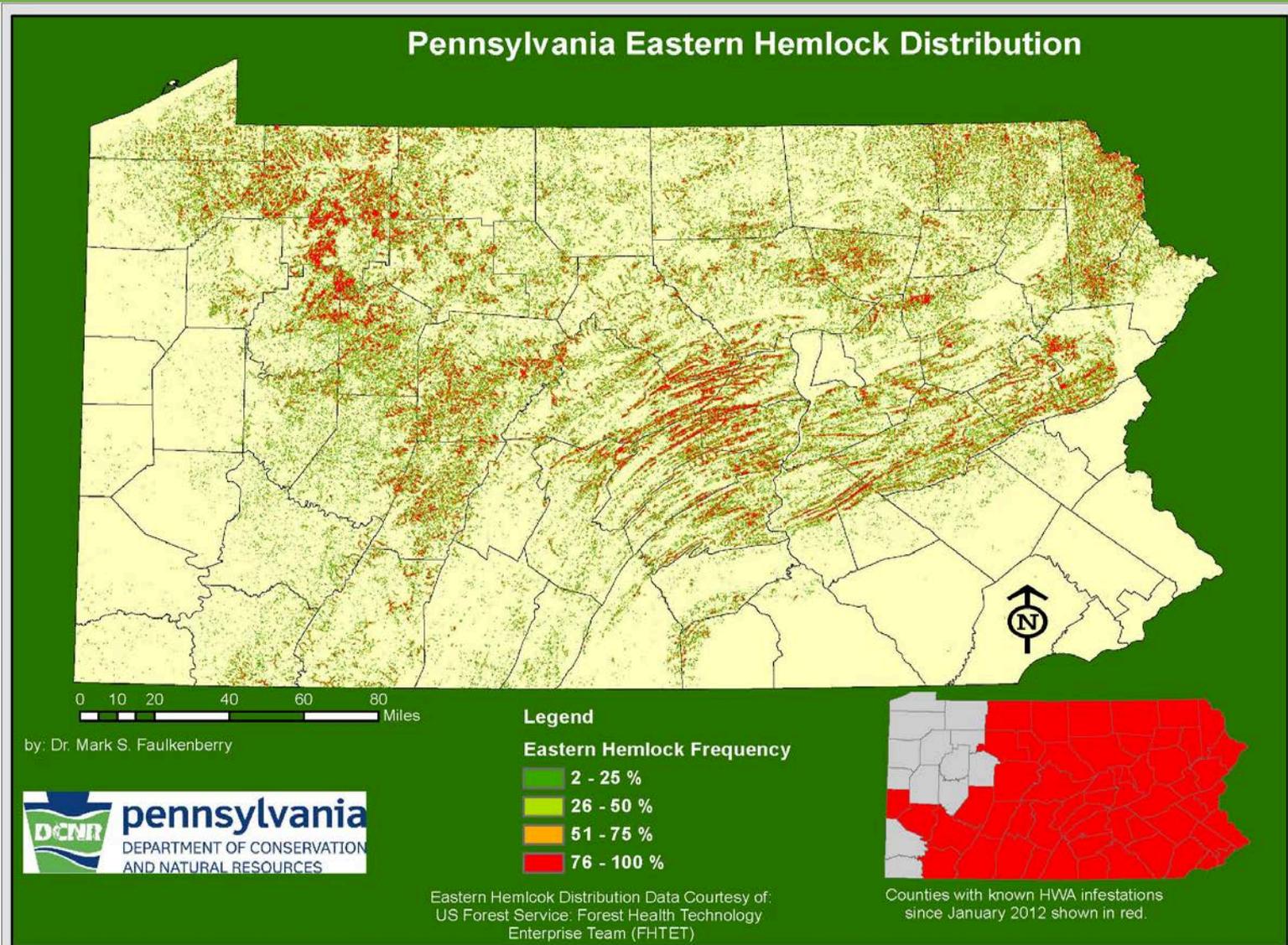
- A. Long term strategy
- B. Priority landscape area(s)
- C. Secondary issues addressed
- D. Program areas that contribute
- E. Key stakeholders
- F. Resources available / required
- G. Measure of success

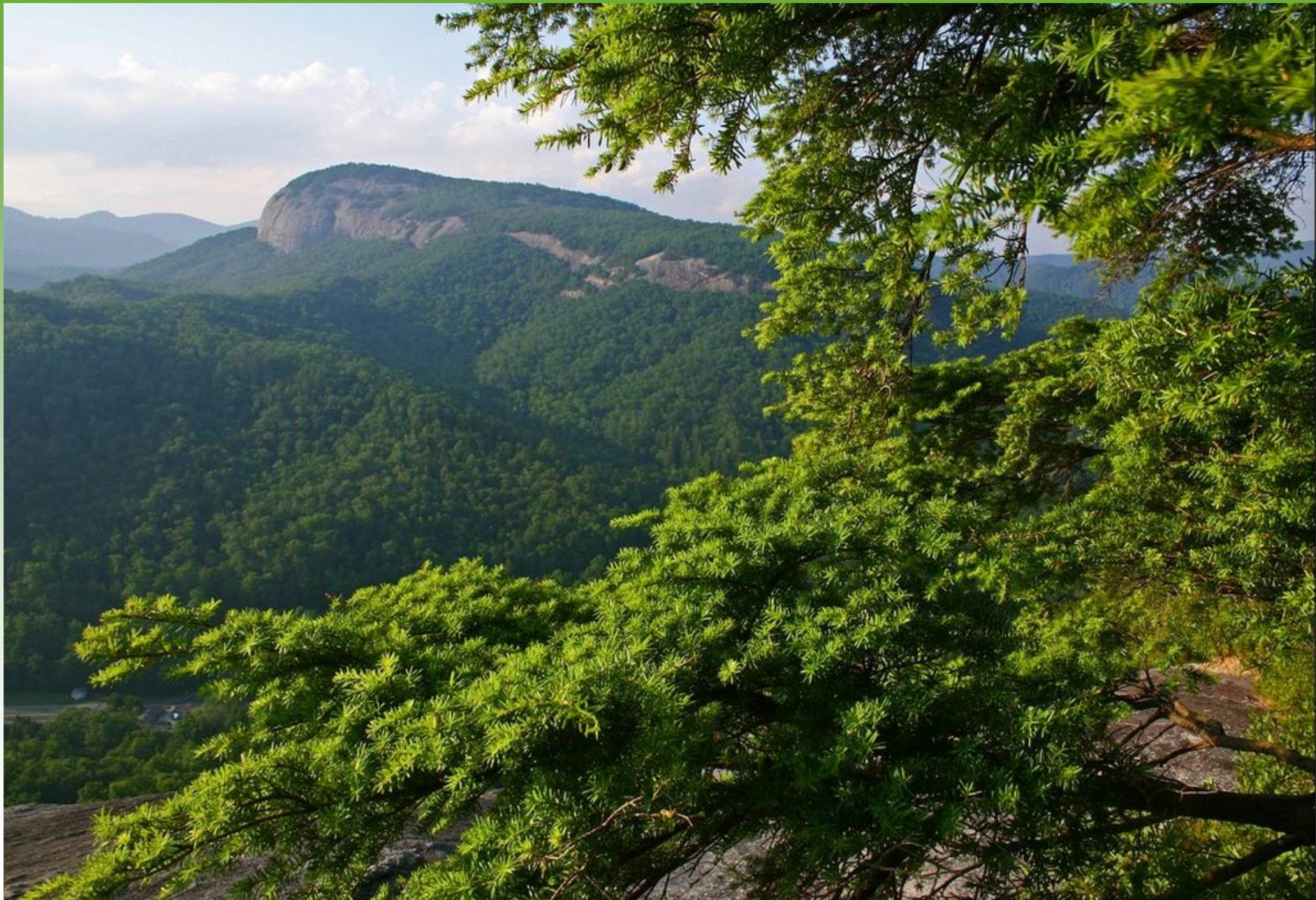


This table was meant as a placeholder to guide our discussion and give us a framework to build on.

Long-term strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas That Contribute	Key Stakeholders	Resources Available / Required	Measure of Success
1. Assess hemlock stands and prioritize them for treatment	Statewide	Plant and animal habitats, water quality	DCNR Bureau of Forestry, Service Foresters, Ecological Services, Forest Pest Management; Private Landowners; USFS; PSU Extension Agents	Private landowners; USFS; TNC; PSU	Bureau Service Foresters, FPM, Ecological Services to train and aid private landowners;	Treatments allocated to stands with highest priority first
2. Survey, monitor, and map hemlock woolly adelgid infestations	Statewide	Plant and animal habitats, water quality	DCNR Bureau of Forestry FPM; USFS; private landowners	Private landowners; USFS; PSU	FPM monitoring permanent plots for hemlock every three years, FPM establishing temporary general hemlock survey plots annually on leading edge of infestation front; FPM conducting aerial surveys; FPM and Service Foresters to aid private landowners in training to detect and monitor HWA infestations; USFS staff to track infestations occurring in Allegheny National Forest	HWA infestation front boundaries are established and tracked and new infestations discovered early
3. Closely monitor focus areas designated in plan	<u>State Forest land</u> : Cook Forest State Park, Snyder Middleswarth Natural Area, Detweiler Run Natural Area, Alan Seeger Natural Area, Bear Meadows Natural Area; <u>National Forest land</u> (Allegheny National Forest): Tionesta Scenic and Research Areas, Heart's Content Scenic Area	Plant and animal habitats, water quality	DCNR Bureau of Forestry FPM, Affected State Forest Districts; USFS	USFS	Bureau FPM Staff, State Forest District Staff; USFS ANF staff	High priority areas monitored annually, new infestations reported promptly so they can be treated

# Hemlock Distribution in PA





<http://savethehemlock.blogspot.com>



[www.dcnr.state.pa.us](http://www.dcnr.state.pa.us)



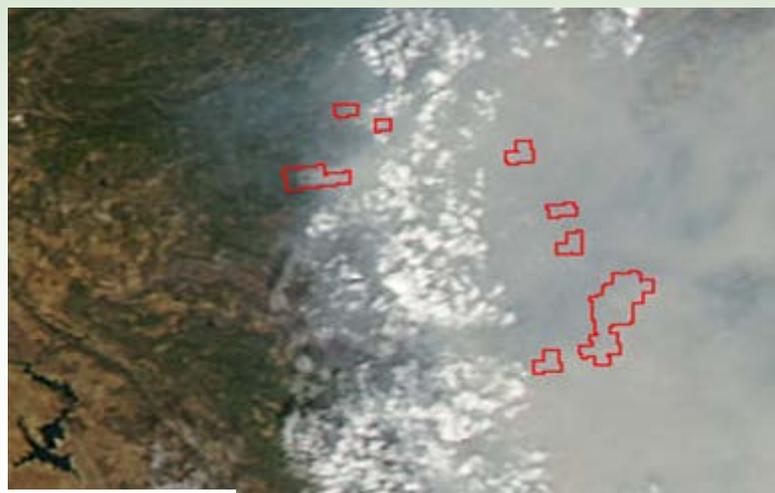
August 25th



August 29th



September 2nd



MIKE SALWAY PHOTOGRAPHY  
WWW.MIKESALWAY.COM.AU



Conservation Strategy	How does our conservation strategy look and are we missing something? <hr/>
Prioritization	Should separate priorities be developed for public & private land? Do the low/high priorities make sense? Is something missing? Are our initial focus areas correct? Are there other areas to consider?
Implementation	Should public and private implementation strategy be separate? <hr/> Do we all agree to be part of the implementation plan somehow? <hr/> Are there other implementation issues to address? <hr/>

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Long-term strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas That Contribute	Key Stakeholders	Resources Available / Required	Measure of Success
4. Prioritized and designated hemlock areas treated with chemical control measures	Statewide	Plant and animal habitats, water quality	DCNR Bureau of Forestry FPM, Affected State Forest Districts; USFS; Private Landowners	USFS, Private Landowners	Bureau FPM Staff, State Forest District Staff, Service Foresters; USFS ANF staff	Hemlocks that were designated to receive chemical treatments are treated
5. Release of <i>Laricobius nigrinus</i> and <i>Scymnus camptodromus</i> (if experimental releases show promise)	State Forest Land	Plant and animal habitats, water quality	DCNR Bureau of Forestry FPM, PSU	PSU	Bureau FPM Staff, PSU Staff	Biological control agents able to establish and reduce HWA populations
6. Any hemlocks exhibiting resistance to HWA reported promptly to DCNR Forest Pest Management and the Alliance for Saving Threatened Forests	Statewide	Plant and animal habitats, water quality	DCNR Bureau of Forestry FPM, USFS	Private landowners, USFS, Alliance for Saving Threatened Forests	Bureau FPM Staff, State Forest District Staff, Service Foresters; USFS ANF staff	Any resistant hemlocks found are reported to the Bureau and NCSU

Long-term strategy	Priority Landscape Area(s)	Secondary Issues Addressed	Program Areas That Contribute	Key Stakeholders	Resources Available / Required	Measure of Success
7. Remove dying or heavily damaged hemlocks that will not be treated and influence regeneration on site	Statewide	Plant and animal habitats, water quality	DCNR Bureau of Forestry, Service Foresters, Ecological Services, Forest Pest Management; Private Landowners; USFS; PSU Extension Agents	Private landowners, USFS	Bureau FPM Staff, State Forest District Staff, Service Foresters; USFS ANF staff	Regeneration of desired tree species is achieved in sites
8. Preservation of hemlock genetic material	Statewide	Plant and animal habitats, water quality	DCNR Bureau of Forestry, Service Foresters, Ecological Services, Forest Pest Management	Private landowners, USFS	Bureau FPM Staff, State Forest District Staff, Service Foresters	Hemlock genetic material was collected from Pennsylvania

