



# FWF Update Newsletter

Department of Forestry, Wildlife and Fisheries

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Website: <http://fwf.ag.utk.edu>

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## Decline in Deforestation?

*Wayne K. Clatterbuck, Professor, Forest Management and Silviculture*

The United Nations Food and Agriculture Organization (UNFAO) has announced that the worldwide rate of deforestation has declined for the first time on record. Although the planet lost 13 million hectares of forest (out of a worldwide total of 4 billion hectares) from 2000-2010, that marks a decline from the 16 million hectares lost from 1990 to 2000. If my arithmetic is correct, over the last 10 years, 0.375 of one percent (.00375) of the forests worldwide were deforested for other uses.

Some locations added forest land, while others lost. Asia was the biggest gainer, adding 2.2 million hectares a year in the past decade. The amount of forest land in the United States has remained fairly constant at approximately 302 million hectares (735 million acres) of forests or about 7.5 percent of the forests on the planet. In certain countries, especially in the tropics, deforestation is more of a concern.

The explanation given by the UNFAO for the decline in the deforestation rate is the effort in many countries to plant trees and restore forests. However, another potential reason not mentioned is that greater and more intensive management of some forests has produced more wood, fiber or biomass per unit area allowing other forests to remain intact and not be harvested. If a greater volume of wood can be produced on fewer acres, then more forested acres are available for other uses.

Most forests in Tennessee are producing wood at less than 50 percent of their potential. If we could increase production on these forested lands by only 50 percent (75 percent of potential), then more forested land would be left for purposes other than wood production. Sound forest management would leave forests as forests and still produce renewable wood products as well as sustainable forests.

## **Control Measures for Hemlock Woolly Adelgid**

*Wayne K. Clatterbuck, Professor, Forest Management and Silviculture*

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The Hemlock Woolly Adelgid (HWA) is an exotic hemlock pest responsible for the decline and death of eastern and Canadian hemlock. The insects feed on the new twig growth at the base of hemlock needles with piercing and sucking mouthparts. The foliage turns yellow, then brown and dies; the twigs and branches desiccate; the limbs die back within two years; and the tree eventually dies within 2 to 10 years. The adelgid feeds on all ages of hemlock.

Unfortunately, a permanent control of HWA for hemlock populations is not available. Limited control of the adelgid on individual or small groups of hemlocks can be accomplished with repeated applications of insecticidal soaps, horticultural oils and insecticides. However, these applications are just short-term solutions to maintain the trees and must be reapplied to sustain the hemlocks.

Insecticidal soaps and horticultural oil sprays should be applied when the adelgids are active, generally twice a year during late May through early June and in August through September. Complete coverage is needed for effective control and a high pressure spray is necessary to completely drench and saturate the foliage from both above and below the branches. For large trees, spraying is not feasible. A disadvantage to this control is that the soap or oil can be washed off easily during heavy or continual precipitation making reapplication necessary. The surrounding environment should be protected during these sprays by making sure that the spray does not get into surrounding water sources such as ponds or streams.

The insecticide, imidacloprid, can be used as a foliar spray, applied in the root zone as a soil drench, or injected into the tree trunk (only by licensed arboriculturists). The foliar spray can only be used on trees located away from water sources. Imidacloprid is available in both granular and liquid forms; the granules can be sprinkled underneath the crown of the tree and will enter the soil with rainfall while the liquid form is mixed with water and poured on the soil. The insecticide is absorbed by the tree roots and then transported through the tree to the feeding HWAs. Instructions on the container label should be specifically followed to make sure the correct amount of insecticide gets into the tree without causing harm to the surrounding environment. Imidacloprid is available over the counter at most garden stores. Application of the insecticide should be in April and May near the beginning of the growing season when the sap in the tree is beginning to flow. It may take two months for the insecticide to move into the foliage of the tree. One application should protect the hemlock tree for at least two years before another treatment is necessary. Generally the insecticide should be applied before the tree becomes heavily-infested with HWA. Infested trees have poorer vigor and uptake of the insecticide will be reduced.

Although there are natural enemies that feed on HWA, they are not effective at reducing populations enough to prevent tree mortality. Research is taking place for a biological control of HWA with predator beetles. However, preliminary results indicate that using these beetles in forested situations has been less than desirable. There are just not enough beetles to make an impact on HWA in heavily-infested trees.

Although a permanent solution to HWA is not available, the insecticide treatment is successful for treating single trees or small groups of trees. Thus, a method is available to maintain hemlock trees from HWA for several years. However, the insecticide should be applied every two to three years to ensure that hemlocks remain vigorous and less susceptible to HWA.

For more in-depth information on HWA, symptoms, life history, and control, refer to UT Extension publication SP503-G by Dr. Frank Hale at the following web address:  
<http://utextension.tennessee.edu/publications/Documents/SP503-G.pdf>

## Drying Flooded Wooden Structures

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*Adam Taylor, Assistant Professor, Forest Products*

Wood in a house always has some water in it, and that isn't a problem. Problems begin when there is enough water to support the growth of fungi and insects in the wood. After a flood, rapid drying is the key to recovery. Once the wood is dried to a safe level, the renovation can begin.

There are two types of water in wood. The first 0-25% (approximately, based on a dry wood basis) is called *bound* water because it is chemically attached to the wood fibers. This water is not available for fungi and insects. At moisture levels above about 25%, the additional water is all *free* water that is available for the mold and rot fungi and insects that can damage wood. Thus the safe level for wood moisture levels is below 25%. Because moisture levels vary within and between pieces of wood, and because measuring moisture is imprecise at high levels, it is recommended that wood moisture levels be consistently below 20% before renovation continues (eg. Replacing insulation and wall board). This is why construction lumber is kiln-dried to 19% ("KD19") or below during the manufacturing process.

Moisture levels in wood can be easily and rapidly estimated using hand-held meters. Pin-type or pinless meters are available and both will work well to quickly determine if the wood is at a safe moisture level (consistently below 20%). A video is available that shows how to use these meters at the following website: <https://extol.tennessee.edu/certifications/login/index.php>

Here are a few tips that can help with rapid drying of wood in a flooded home:

- Remove all wet, water-holding materials such as wall board and insulation. Wood that has been flooded does not need to be removed, only quickly and thoroughly dried.
- Establish good drying conditions in the house. Pump out, mop up or drain out all standing water. Open doors and windows and use fans to circulate air from outside throughout the house.
- Use dehumidifiers in places where natural drying is slow
- Running the furnace can help to heat up and evaporate water.
- Do *not* paint wet wood, even with mold inhibiting paint. These coatings will slow the drying process.

Under good drying conditions, wet wood can be thoroughly dried in a matter of days. If conditions aren't favorable for drying, wood will stay wet indefinitely. The only good way to track the drying of a flooded house, and to verify that the wood is at a safe moisture level, is to use a moisture meter.

For more information on flood recovery, visit

<http://utextension.tennessee.edu/Pages/floodrecovery.aspx>

## Converting Between Doyle and International Board Foot Rules

*David Mercker, Extension Specialist, Forestry*

Landowners, timber buyers, loggers and foresters often have difficulty in converting between two common measures of board foot volume in standing trees. Much of the timber industry operates with the Doyle Rule, while some use the International ¼” rule. It is commonly understood that the Int. ¼” rule is the more accurate, in that Doyle underestimates lumber volume, particularly in the smaller diameter trees.

Some timber sales are offered with trees that were measured using the Int. ¼” rule, and potential bidders accustomed to operating with Doyle rule must convert. A conversion factor is often used. With standing trees for instance, to convert Int. ¼” to Doyle, the Int. ¼” can be multiplied by .78. To convert Doyle to Int. ¼”, the Doyle volume can be multiplied by 1.3.

Such conversion factors may be too general, particularly when the trees being measured are noticeably small or large. Both of the above conversion factors appear to be based on the average tree (in the stand) measuring a 22” in diameter at breast height (dbh) with three 16 foot logs (22” x 3). With most private timber sales, an average of 22” x 3 would be considered a large tree. In such cases, the factors to convert between rules should be adjusted.

For a quick reference, the following tables have been adapted to aid readers in conversion of Doyle to Int. ¼” and vice versa. Notice the conversion factors vary considerably by dbh and somewhat by the log length. For further inquiry, contact a professional forester.

**Table 1. Conversion of Board Foot Volume from Doyle to International ¼” Rule**

No. 16 Foot Logs					
DBH	1	2	3	4	Average
14	1.63	1.76	1.87	1.94	1.8
18	1.36	1.42	1.46	1.51	1.4
22	1.21	1.25	1.28	1.31	1.3
26	1.12	1.15	1.17	1.19	1.2
30	1.07	1.09	1.10	1.12	1.1
34	-	1.04	1.06	1.07	1.06
38	-	1.01	1.02	1.03	1.02

Multiply Doyle volume by these conversion factors to arrive at Int. ¼”.

**Table 2. Conversion of Board Foot Volume from International ¼” to Doyle Rule**

No. 16 Foot Logs					
DBH	1	2	3	4	Average
14	.62	.57	.53	.52	.56
18	.74	.70	.68	.66	.70
22	.82	.80	.78	.72	.78
26	.89	.87	.85	.84	.86
30	.93	.92	.91	.89	.91
34	-	.96	.95	.94	.95
38	-	.99	.98	.97	.98

Multiply Int. ¼” volume by these conversion factors to arrive at Doyle.

## Hardwood Analysis and Trends (HAT) – June 2010

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*David Mercker, Extension Specialist*

Slow but steady, the rebound in hardwood lumber prices continues. Reports around the region indicate that private timber sales are faring very well, with strong interest among buyers. However, the once short supply of logs that contributed to the rebound is turning. Log yards are beginning to fill. Now the issue at hand is whether the market can bare increased lumber production expected this summer and fall.

New housing starts have improved yet they are still well below historical levels. One year ago **HAT** reported that housing starts would begin a rebound once the inventory of existing houses (on the market) reaches 2.5 million units (or slightly less than an 8 month supply). As of April, we stood at 4.0 million units (Hanley Wood Market Intelligence). It appears that as existing houses sell, new ones (foreclosed upon) are released by the banks. We will continue to work through a surplus of houses for some time.

It is very difficult to predict the market beyond the present. A year ago, who would have envisioned that #1 common lumber for these species would rise this much in a year? **HAT** sure didn't.

Red oak	+33%
White oak	+46
Tulip poplar	+38
Black walnut	+32
Black cherry	+ 5
Hard maple	+ 8
Ash	+33
Hickory	+ 6
Soft maple	+16

Across the board pluses . . . is great news indeed. It is a good time to consider selling hardwood timber. For most species in our region, prices are stronger than at any time over the past five years.

Summarized with permission of the Hardwood Market Report, Memphis, TN.

## The High Cost of High-Grading

Larry Tankersley, *Extension Forester*

**What is High-Grading?** A timber harvest that removes the trees of commercial value, leaving small trees, as well as large ones of poor quality and of low-value species. High-grading reduces the value of the woods by removing the largest, most valuable trees and increasing the composition of the poor quality and traditionally low-value species, e.g., red maple, beech, elm.

**How does it occur?** High-grading occurs when landowners sell infrequently, are unaware of the consequences of how the trees are removed and have immediate needs for income. High grading is also common where we have poor markets for smaller and lower quality trees but good markets for high quality trees. Communication is also confused when terms like selective cutting are used to imply good management while removing the best trees.

Since trees in most wood lots are the same age, cutting the biggest trees does not leave young ones to grow. Rather, these cuttings take out the fastest growing trees, leaving slow growing, less vigorous trees of the same age as those removed.

**Why is it a big deal?** In most cases high grading results in a greater harvest volume and value from the first cutting, compared to forests managed silviculturally. However, neither the harvest volume or timber quality is sustained over the long run. After a high grade harvest, the forest provides:

- less total volume because of slow growing trees and irregular spacing between them,
- less volume from large trees of the more valuable size classes (16" +, veneer),
- more volume from poor quality trees and low value species,
- less frequent opportunities to return for another harvest.

**How do you tell if your place has been High Graded?** High-grading is highly variable. In some instances it is really not that bad with a lot of pretty good trees left after the cut. In other instances there is often not much left to work with all the “good” trees are gone. High-graded woods have:

- few “good” trees remaining
- more “poor” trees remaining
- patchy distribution, dense clumps, wide openings
- lots of area in skid trails.

**What to do?** Hire a competent forester to:

- develop a plan.
- mark trees to remove/keep
- require good skidding
- mark trails
- include penalties in sale contract
- regularly inspect the logging job and communicate with the crew.

**Restoration Strategies.** If your forest has been high-graded you need to improve the growing stock by favoring better species and encouraging good spacing. How we do this will depend on the extent of the high grading. The extent of the high grading will depend on the number of desired stems left after the harvest.

Where more than 50 good trees per acre are left, you are in pretty good shape and can do a bit of improvement cutting and let the trees grow. Where you have 20 - 50 good trees remaining you should consider some type of regeneration cut in the near future, merchandising or deadening larger residual trees and releasing desirable seedlings and sprouts.

Where you have 5- 20 good trees per acre left. You are definitely looking to regenerate the stand even supplemental planting. Where less than 5 good trees per acre are left you may be out of the timber business or looking to regenerate or plant.

## **Wildlife Management Calendar for July**

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*Craig Harper, Professor, Wildlife Management*

### **Wildlife Notes**

Blackberries ripen in early July

July is peak breeding season for black bears

July is also peak time for the second litter of squirrels

Lots of quail born in July. **DO NOT MOW** early successional habitat (old-fields)!

Ducks and geese molt in June and July and are flightless for a couple weeks.

Bullfrog breeding peaks in July

### **Habitat Management**

Mow and spray perennial forage food plots for weed control if necessary

- refer to *A Guide to Successful Wildlife Food Plots: Blending Science with Common Sense*, PB 1769, for specific herbicide and additional management information

Burn unharvested wheat fields that have been left standing for doves

Collect soil test samples from plots to be planted this fall and lime now as needed

Plant wild or browntop millet and/or buckwheat around beaver sloughs and other areas that will be flooded in November for ducks

Construct/repair dikes and water-control structures for flooding fields/woodlands for waterfowl this fall/winter

Spray undesirable woody plants in early successional habitat

- multiflora rose, privet, sericea lespedeza, sweetgum, green ash, and *Ailanthus* are examples of undesirable woody plants in early successional habitat
- Roundup, Garlon 3-A, Arsenal, Cimarron, and PastureGard should be considered
- refer to Appendix 4 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, PB 1752, for additional information

**DO NOT** mow old-fields and associated early successional habitat!

- destroys cover for wildlife at a time it is needed most (nesting and raising young)
- stimulates grass and leads to reduced forb cover (which means less food and cover)
- increases thatch at ground level and makes travel through the field much more difficult for wildlife
- manage old-fields by burning or disking in late March/early April; **don't mow them!**
- refer to Chapter 6 in *Native Warm-Season Grasses: Identification, Establishment, and Management for Wildlife and Forage Production in the Mid-South*, PB 1752, for additional information on managing early successional habitat



## **Wildlife Damage/Population Management**

Put up chicken-wire fence 2 feet high around vegetable gardens to protect them from rabbits

Put up a 2- or 3-strand electric fence (one strand 6 inches above ground and the other 6 inches higher) to keep groundhogs and raccoons out of vegetable gardens

To repel deer from vegetable gardens,

- erect a single-strand electric fence (2 ½ feet above ground) with aluminum tabs attached every 3 – 5 feet.
- Smear peanut butter on the aluminum tabs. Deer are attracted to the peanut butter. When they touch the aluminum tabs with their mouths, they learn to stay away.

Nuisance crawdads in the yard may be remedied by pouring boiling water down the spout of the mound

To keep bats out of attics and out from under vinyl siding and other areas,

- close or cover up all holes and cracks so they can't get in!
- do this at night after bats have left the roost; it may be necessary to open the hole the following night to allow any bats that were trapped inside a chance to leave
- maternal colonies will migrate to hibernation sites in the fall. If you wait until then to close holes and cracks, you will avoid trapping any inside.

“Repel” snakes by cleaning up around the house – mow more often, remove piles of wood, brush, and trash. There is no reliable “repellent” for snakes; only “snake oil”

Refer to *Managing Nuisance Animals and Associated Damage Around the Home*, PB 1624, and visit <http://icwdm.org> for additional wildlife damage management information.



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