2015 Stump Audit Report

Indiana DNR Division of Forestry

Executive Summary

In March 2015, the DNR Division of Forestry (DoF), using DoF personnel, conducted stump audits on four harvest areas in state forest properties covering 231 acres on harvests completed in 2014. The 2015 audits were carried out on Harrison-Crawford compartment 30 - tract 2, Martin compartment 7 - tract 6, Owen-Putnam compartment 1 - tract 3, and Yellowwood compartment 14 - tract 24. These four sites represented more than 10% of all the sites that had a timber harvest that was completed in calendar year 2014. The sites were randomly selected for the audit.

In this audit we accounted for 4,082 out of a total of 4,281 marked sawtimber, poles, and culls that were marked for harvest in these sites, which is 95.35% accountability. There were 89 (2.2%) of the 4,082 trees and stumps accounted for that fell into the category of "Cut Stump/Unmarked," and many of these stumps were in trails or on landings where all the bark had been removed by equipment and logs running over them. These four sites were common state forest timber harvests. However, the Yellowwood site had a series of wildlife openings that were put in. This increased the number of trees, which had 2,287 trees, poles, and culls marked for the harvest even though the harvest covered only 60 acres.

Background

In the early 1980s through the late 1990s the DoF audited, at random, 10% of its completed timber harvests each year. This stump audit process is a check to be sure that only the trees that were marked to be sold and harvested were indeed harvested and those that were not marked were left in the woods. In the late 1990s this type of audit was stopped while emphasis was given to auditing Best Management Practices (BMPs), because both audit types require large amounts of resources in personnel and time. As the BMP audits evolved over time and became more efficient and GPS equipment became available to make the stump audits more efficient, the DoF was able to do both types of audits, and so the stump audits began anew in 2011. In 2012, the DoF was prevented from completing the stump audits for that year by a tornado that tore through hundreds of acres in Clark State Forest. The resources that the DoF would have used for the audits were transferred to helping conduct salvage efforts in the tornado-damaged areas. In 2013, the DoF got back to completing stump audits and plans to continue to doing so in perpetuity.

Methods

At the beginning of each calendar year the DoF identifies all timber harvests that were closed out in the prior year. For instance, in early January 2015, the DoF listed all the timber harvest areas that were completed and closed out in 2014. From that list the DoF chose 10% of those harvest areas, at random, for audit. In 2015 that 10% made up four timber sale areas on four different state forest properties. Once chosen, the head Resource Specialist assembles teams of anywhere from four to twenty DoF personnel to carry out the audit.

The ultimate goal of a stump audit is to find every tree that was marked for the harvest, GPS its position, and record its condition (cut and marked, cut, marked and left, or left standing). In a

perfect stump audit 100% of the trees that were marked and tallied for the sale would be found, and there would be no discrepancies. However, in the real world, conducting a stump audit is hard work that involves looking under fallen tops that are usually filled with dead leaves and debris in places that only a rabbit was designed to crawl through. These places are difficult for a person to crawl into to see if there is a stump underneath it. Hence, there are stumps and even standing marked trees that can be unaccounted for in a stump audit. Our goal is to account for at least 90% of the marked timber in the harvested tract and to be fairly certain that all the trees that were harvested were marked to be harvested.

In order to conduct an audit, each person on the auditing team is given a GPS unit containing a map of the area to be audited, and each team member is assigned a set of numbers. Each team member, working in coordination with the others, will work through small areas of the harvested tract looking for harvested trees, by looking for stumps and tops, and will record where the stump is, the tree species, and whether the team member can find a "stump mark." While carrying out this task, each person will also check standing trees to see if they were marked to be harvested, but were left. If any marked, standing trees are found, they are recorded in the GPS unit. The total of recorded trees should be within 5-10% of the number of trees marked for the harvest without having more trees audited than what was tallied to be sold. If more trees are found harvested or left than were marked for the harvest, then an investigation would be started.

Auditors, when recording a tree, must record what they have found and have the option of marking them as CutStump/Marked, StandingTree/MarkSaw, StandingTree/MarkPole, StandingTree/Cull, and CutStump/Unmarked. The first part of each designation tells whether the recorded tree was standing or felled, and the second part tells if the tree was marked, marked cull, or had no bark, and in the case of standing trees, it tells the product class the tree fit into per DoF protocol (Appendix). If the tree is cut, the auditor will look for a mark, but often the cut line of the stump will be level with part of the stump mark; therefore, the auditor will see the stump mark, but not be able to differentiate between an "x" and a dot. However, if they find no stump mark, they will record "unmarked," which does not necessarily mean that it was an unmarked tree, but that the mark was above the cut line, the bark was rubbed off during the moving of the timber, covered with mud, or any number of things. Should there prove to be many unmarked stumps and more trees harvested and marked than what was tallied, an investigation will be conducted.

The team will form a type of "picket" line to cross a hill or area, but not lose sight of each other so that team members know that there are no stumps or marked standing trees missed. Each recorded tree will be assigned a number from the set of numbers that each individual team member was assigned and they will also paint that number on the tree or stump they found so that no trees are counted more than once. As each area of the harvest is covered, the team will move to a new area until the entire harvest area is completed. In smaller areas with just a few trees, a small number of people can accomplish this task in less than an hour. Bigger areas with thousands of trees can take more than a day with a large team.

Once the team members complete the audit on-site, they download what they recorded on the GPS unit into the computer of the LTB Forester who then will analyze the data and make sure they are within 90% of the number of trees that were to be harvested. Once that is confirmed, the

team is released to go home and the data are analyzed at a later date to be sure the team did not find more trees than were supposed to be harvested.

Results

In the four tracts that totaled 4,281 trees, poles and culls were marked for harvest and 4,082 were accounted for in the audits, for 95.35% accountability, well above 90%. There were 2,635 stumps that were marked, which is 64.6% of the 4,082, 737 (18.1%) standing marked poles, 410 (10.0%) standing trees marked as sawtimber, 159 (3.9%) standing trees marked as culls, 89 (2.2%) stumps did not have marks on them that could be found, 29 (0.7%) stumps that were marked as culls, and 23 (0.6%) stumps that had no bark on them, so no mark could be found on them.

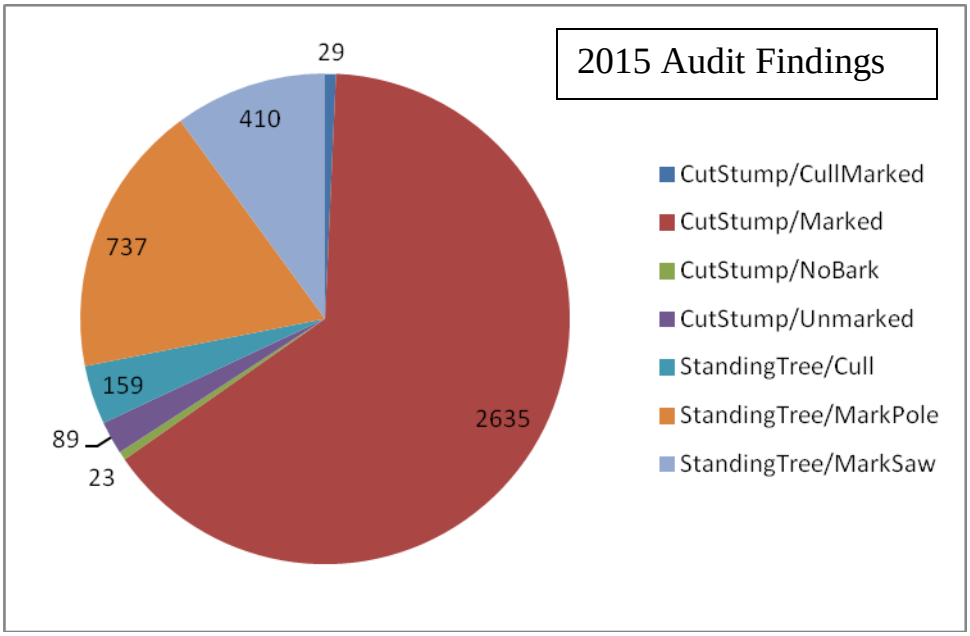

Figure 1. Number of trees audited in each category.

Individual Tract Findings:

Harrison-Crawford Compartment 30 Tract 2

H-C C30T2 was audited on March 20, 2015, and found 842 trees out of 912 (92.32%) that were originally marked. Of the 842 audited trees and stumps, 16 (1.9%) were cut stumps that had no visible mark, and another five (0.6%) cut stumps had no bark on them, 693 (82.3%) were stumps that were marked for sawtimber and 66 (7.8%) that were marked for sawtimber were found still standing, five (0.6%) stumps found were marked as culls, 33 (3.9%) marked as culls were found still standing, and 24 (2.9%) marked poles were found still standing.

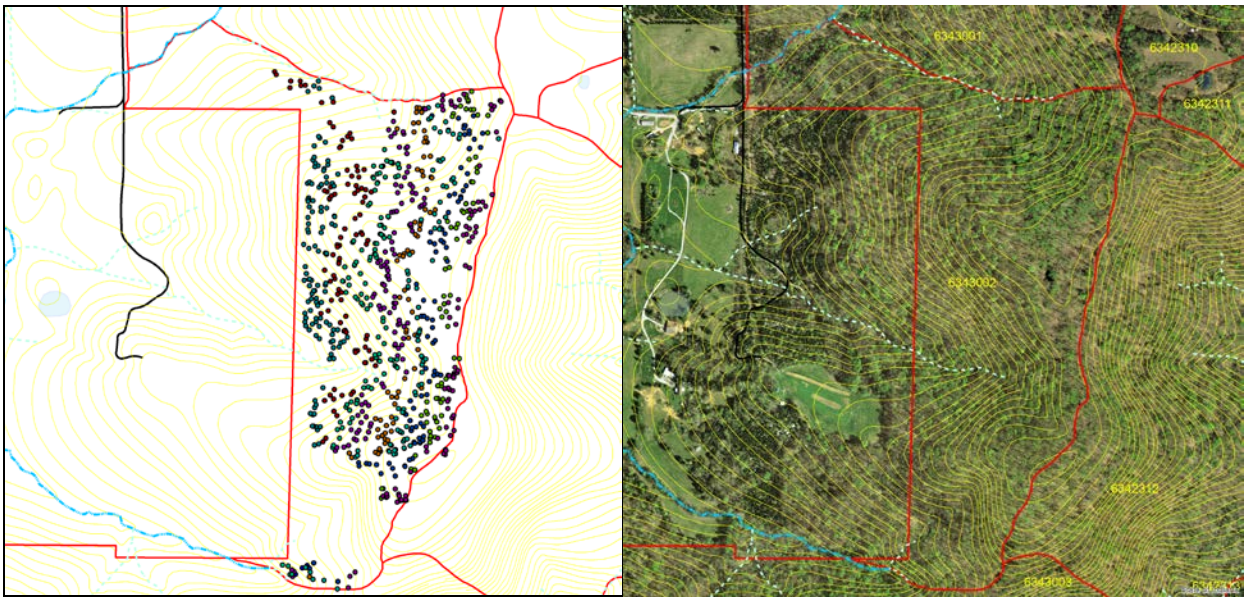

Figure 2. Map of GPS'd stumps and trees and aerial map of H-C C30T2.

Martin Compartment 7 Tract 6

Martin C7T6 is 40 acre tract that had 28 marked acres. This tract was audited on March 19, 2015, and found 424 (99.53%) trees out of the marked 426. Of the 424 audited trees and stumps, 21 (5.0%) were cut stumps that had no visible mark and another 10 (2.4%) cut stumps had no bark on them, 372 (87.7%) were stumps that were marked for sawtimber and two (0.5%) that were marked for sawtimber were found still standing, 12 (2.8%) stumps found were marked as culls, five (1.2%) marked as culls were found still standing, and two (0.5%) marked poles were found still standing.

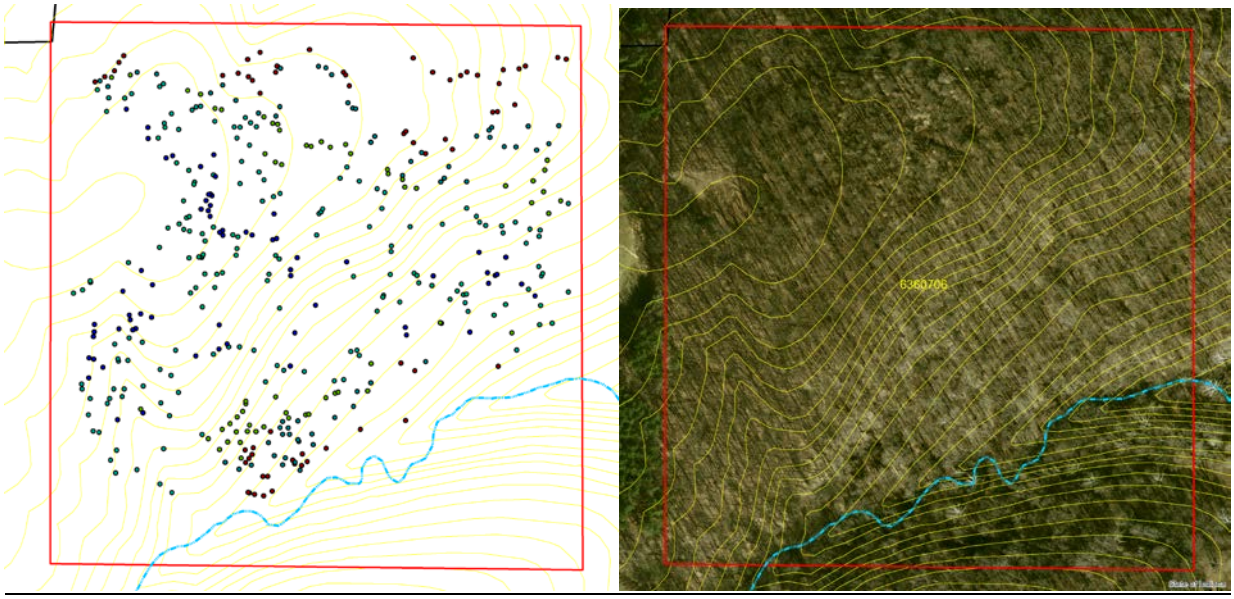

Figure 3. Map of GPS'd stumps and trees and aerial map of Martin C7T6.

Owen-Putnam Compartment 1 Tract 3

O-P C1T3 is 137 acre tract that had 70 marked acres. This tract was audited on March 16, 2015 and found 618 (94.21%) trees out of the marked 656. Of the 618 audited trees and stumps, 24 (3.9%) were cut stumps had no visible mark and another 3 (0.5%) cut stumps had no bark on them, 523 (84.6%) were stumps that were marked for saw timber and 23 (3.7%) that were marked for saw timber were found still standing, there were no stumps found that were marked as culls and 6 (1.0%) marked as culls were found still standing, and 39 (6.3%) marked poles were found still standing.

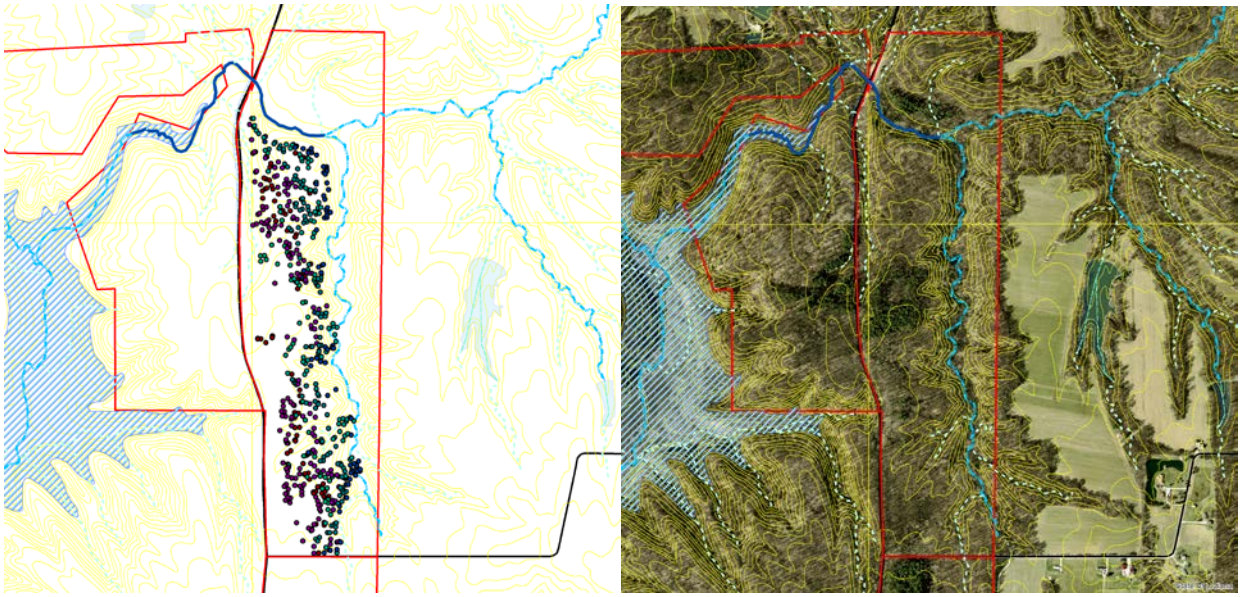

Figure 4. Map of GPS'd stumps and trees and aerial map of O-P C1T3.

Yellowwood Compartment 14 Tract 24

YW C14T24 is 78-acre tract that had 60 marked acres. This tract was audited on March 17, 2015, and found 2,198 (96.11%) trees out of the marked 2287. Of the 2,198 audited trees and stumps, 28 (1.3%) were cut stumps that had no visible mark and another five (0.2%) cut stumps had no bark on them, 1,047 (47.6%) were stumps that were marked for sawtimber and 319 (14.5%) that were marked for sawtimber were found still standing, 12 (0.5%) stumps were found that were marked as culls, 115 (5.2%) marked as culls were found still standing, and 672 (30.6%) marked poles were found still standing.

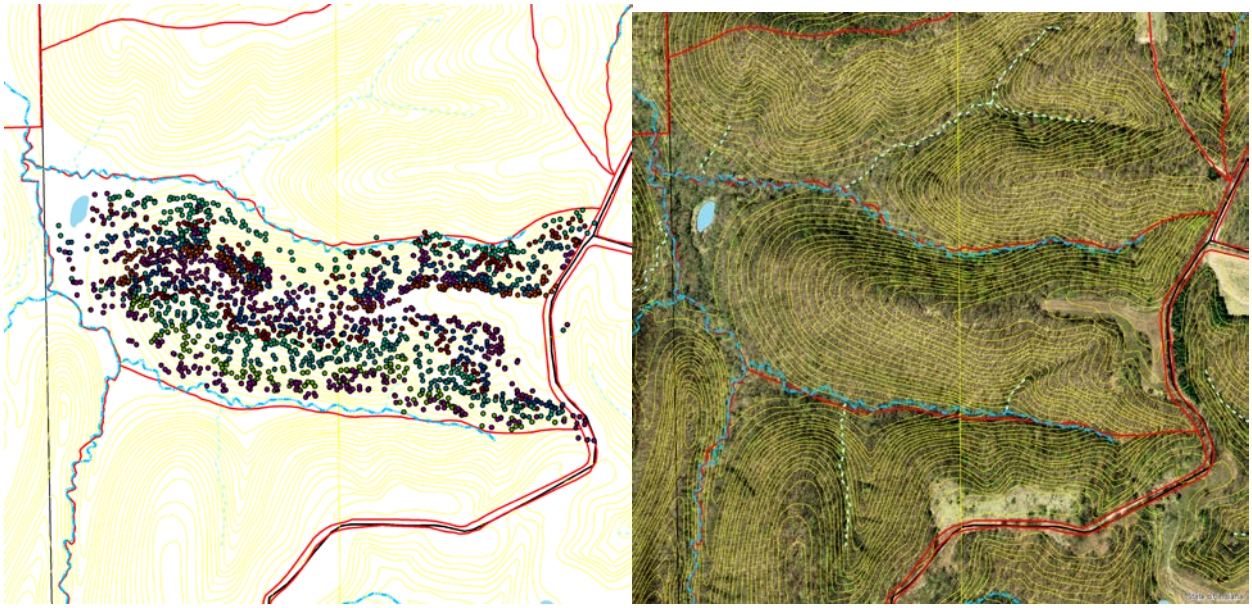

Figure 5. Map of GPS’d stumps and trees and aerial map of YW C14T24.

Appendix

Product Definitions

The product definitions listed below are designed to classify the tree into several useful categories to help determine the existing condition of the forest, and future needs. For the product categories, the trees are considered alive except for the snag product.

S Sawtimber trees are those trees in the 14-inch diameter class and larger that are considered to have merchantable sawtimber volume. Sawlog height is measured using 12-foot logs to a 10-inch dib.

Q Quality sawtimber trees are sawtimber trees that have high quality, i.e., minimal defect, but don't quite reach prime quality. Quality trees must be at the minimum in the 16-inch DBH class. The determination of quality is made in the butt log. Quality trees cannot have any decay defects in the butt log. Quality trees can have some, limited, non-decay minor defect in the butt log, but can have no major defect. There can be no internal decay in the butt log — evidenced through sounding for punky wood or hollow sound. Quality trees can have decay defect in the upper logs as long as it does not produce greater than 20% defect deduction. Sawlog height is measured using 12-foot logs.

V The V is from veneer, but this really refers to prime trees. The term veneer here designates prime trees, per the stated grading guide. The only species to be considered to have prime are black walnut, northern red oak, white oak, chinkapin oak, swamp chestnut oak, swamp white oak, and burr oak. The determination of prime is made in the butt log. If the butt log cannot make prime, but a higher log can, the tree is still not considered prime. To be considered prime, black walnut must have a minimum 8 feet of clear log length on all four faces and a minimum DBH of 17 inches. The oaks must have a minimum of 8 feet clear length on all four faces and a minimum DBH of 19 inches. To be clear log length, there can be no visible defects such as knots, pin knots, catfaces, seams, scars, etc. on the butt log except close to the ground line on root flares. There can be no open defects such as a dead fork, open hole, or surface decay anywhere on the butt log. There can be no internal decay in the butt log — evidenced through sounding for punky wood or hollow sound. Prime trees can have decay defect in the upper logs as long as it does not produce greater than 10% defect deduction. Sawlog height is measured using 12-foot logs.

P Poles are considered to have no merchantable sawtimber volume, and are trees in and smaller than the 13-inch diameter class, down to the six-inch class. Volume in poles in calculated in cords. Poles with defect that destroys their volume can be considered culls. Cordwood height to a 4-inch dib is measured using 16-foot logs.

C Culls are defined as live trees with no merchantable volume. Poles can be considered culls when they are determined to have essentially no sound cord volume. Height to a 4-inch top is measured using 16-foot logs.

N Snags are defined as standing, dead trees. These can be sawtimber size or pole size. Height to a 4-inch dib is measured using 16-foot logs.

A Saplings are live trees in the 5-inch class to the 1-inch class. No merchantable height measure is taken on these.

The leave and remove/harvest designations are to determine the likely status of a particular tree should management activities occur in the area. This would be for trees whose removal is recommended to occur. A tree to be removed could be removed via several operations — TSI, logging, hazard tree removal in recreation areas. In a typical forest situation there are several reasons a tree would be chosen for removal/harvest:

- The tree exhibits poor vigor/weak crown, and will likely die before the next management activity is likely to occur.
- The tree has a major defect, and its removal would benefit surrounding decent trees by providing release.
- The tree is a decent tree in among many decent trees that are competing against one another. The tree must be removed to provide significant release on residual decent trees to improve vigor and growth, and prevent stagnation and eventual mortality.

The tree is competing against other trees that are preferred to reach the desired future condition of the tract, and its removal would benefit the growth of the preferred trees. Preference may be determined by site conditions, species composition, quality, or combinations of these.