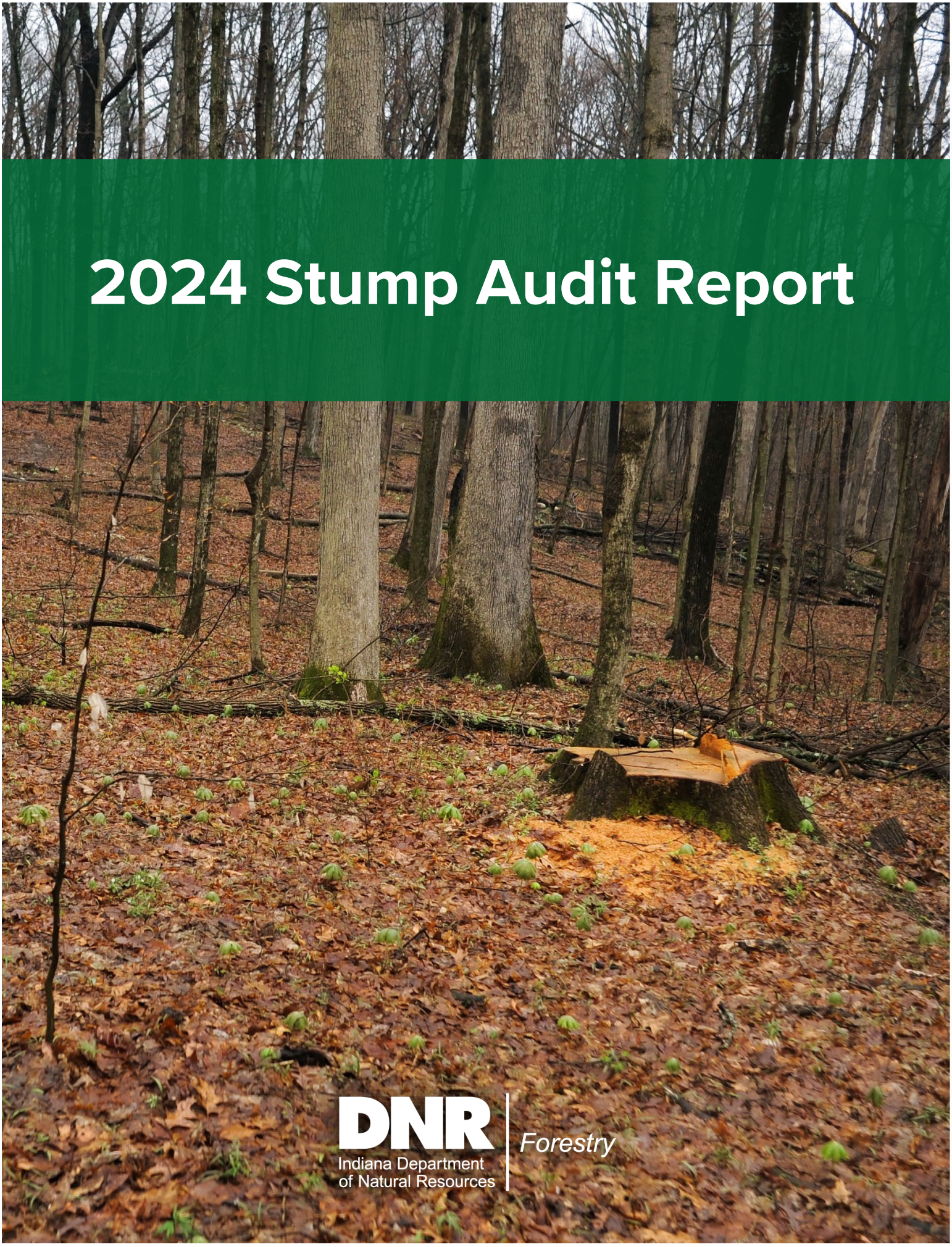
2024 Stump Audit Report

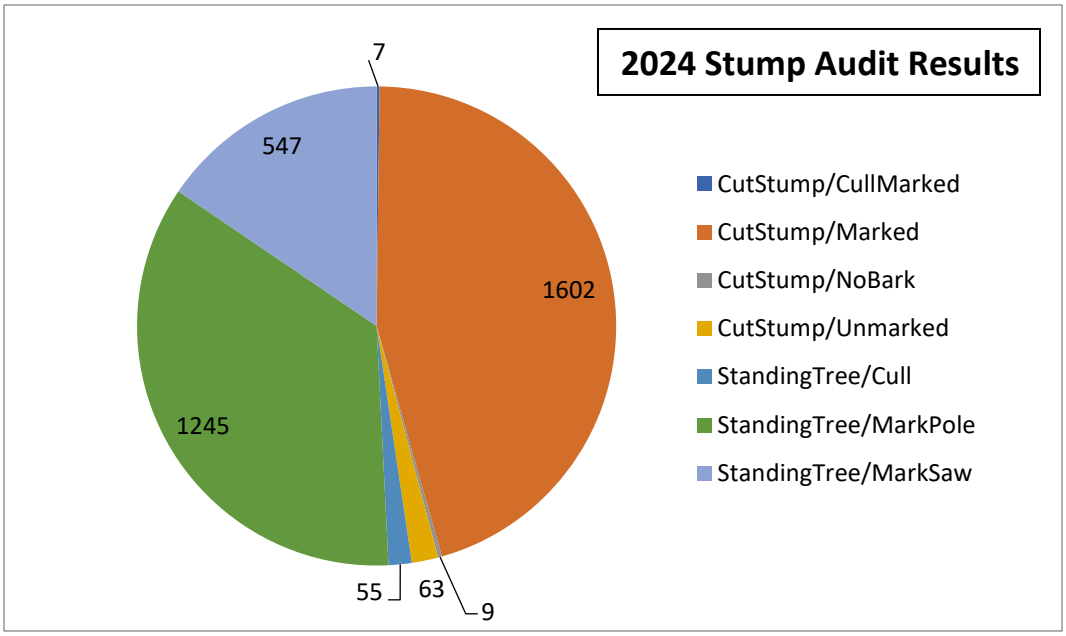


DNR
Indiana Department
of Natural Resources
Forestry

Executive Summary

In 2024, DNR Division of Forestry (DoF) personnel conducted stump audits on three state forest property tracts on which a timber harvest of a cumulative 302 acres was done in 2023. The audits were conducted on Martin State Forest compartment 8 tract 6, Owen-Putnam State Forest compartment 6 tract 3, and Salamonie State Forest compartment 1 tract 3. These sites represent 10% or more of all of the state forest property on which a timber harvest was completed in 2023 and were chosen at random.

In this audit, the DoF accounted for 3,843 out of a total of 4,240 marked saw timber, poles, and culls, which is 90.64% accountability. However, in the Salamonie audit, one person accounted for a known 315 trees, but the data recorder that carried that data was lost. Therefore, most of the summary data and the data for Salamonie will be reported on missing those 315 trees. There were 63 (1.8%) of the 3,528 trees and stumps accounted for that fell into the category of "Cut Stump/Unmarked." Some of these stumps were covered with soil, missing bark or part of the stump, were hard to see because they were covered with debris, or were small trees cut out of the way of larger trees but left on site.



The total number of trees and stumps in the data found during the 2024 stump audit.

Background

From 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 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. As a result, 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 the salvage efforts in the tornado-damaged areas. In 2013, the DoF resumed stump audits.

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 2019, the DoF listed all the timber harvest areas that were completed and closed out in 2018. From that list, the DoF chose three sites, at least 10% of the harvest areas completed in 2018, at random for audit. Once the audit areas are chosen, the head resource specialist assembles teams of anywhere from four to twenty DoF personnel to do 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 (i.e., cut or left standing) and how it was marked (i.e., marked, unmarked, saw timber, or poles). 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. These places are difficult for a person to crawl into to see if there is a stump underneath. For these reasons, there are stumps and even standing marked trees that may 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 reasonably certain that all the trees that were harvested were marked to be harvested. In 2024, we met that expectation overall but fell 47 trees short at the Martin site.

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, in coordination with the others, then works through small areas of the harvested tract seeking harvested trees by looking for stumps and tops, and records where the stump is, the tree species, and whether they can find a "stump mark." Each person also checks standing trees to see if they were marked to be harvested but were left. If they find any stumps or marked standing trees, they record them in the GPS unit. The total 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, an investigation is started.

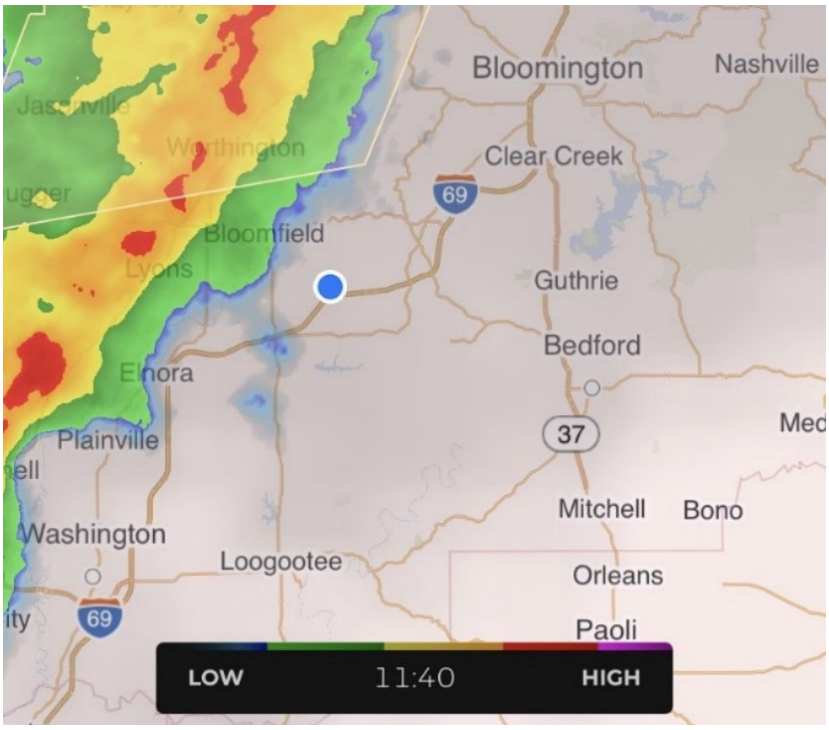
Auditors, when recording a tree, record what they have found as CutStump/Marked, StandingTree/MarkSaw, StandingTree/MarkPole, StandingTree/Cull, and CutStump/Unmarked. The first part of each designation tells whether the recorded tree was standing or felled. The second part tells if the tree was marked, marked cull or had no bark, and in the case of standing trees, tells the product class the tree fits into the DoF protocol (Appendix). If the tree is cut, the auditor looks for a mark, but often the cut line of the stump is 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 record "unmarked". Doing so 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 removal of the timber, covered with mud, or any other 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 to be sure no trees were harvested that were not supposed to be.

A standing tree marked and counted, and a cut stump counted. (Photo by Alicia Ariens)

Members of the audit team form a type of picket line to cross a hill or area but try not to lose sight of each other so they know there are no stumps or marked standing trees missed. Each recorded tree is assigned a number from the set of numbers each team member was given, and they 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 moves 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. Completing bigger areas with thousands of trees can take more than a day with a large team.

Once the team members have completed the audit on site, the team reports how many trees each person recorded, and the data is transferred to the Timber Buyer Licensing Forester who then analyzes the data and makes sure it is within 90% of the number of trees that were scheduled to be harvested. The data is analyzed at a later date to be sure the team did not find more trees than were supposed to be harvested, and that the 90% is confirmed found.



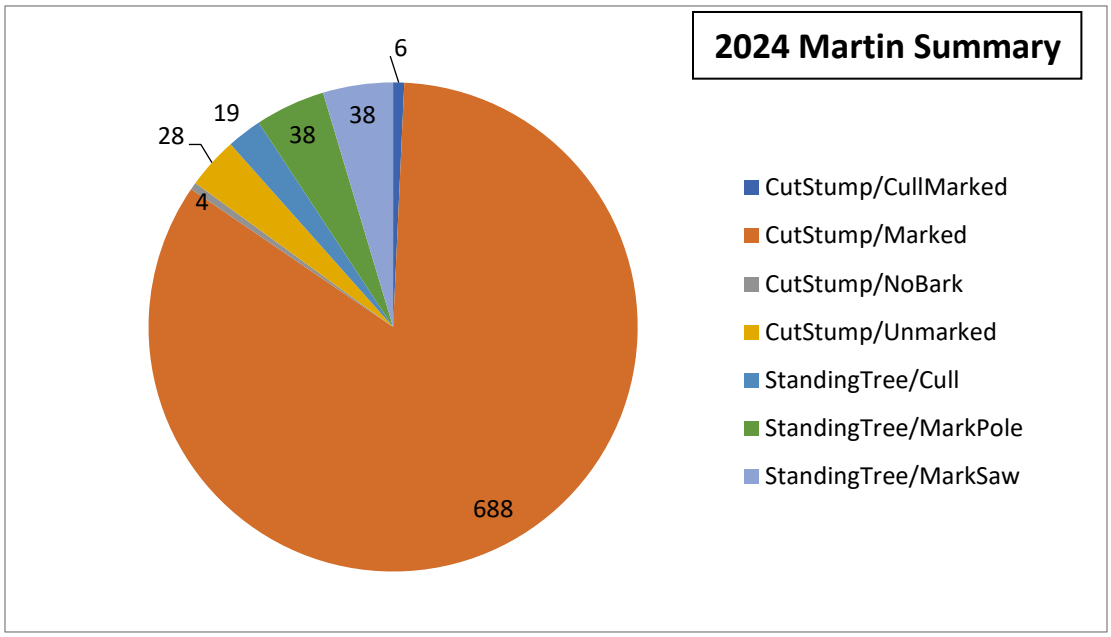
Weather can be a challenge while doing a stump audit.
(Picture by Zachary Smith)


Trail after heavy rain at Martin State Forest.
(Picture by Duane McCoy)

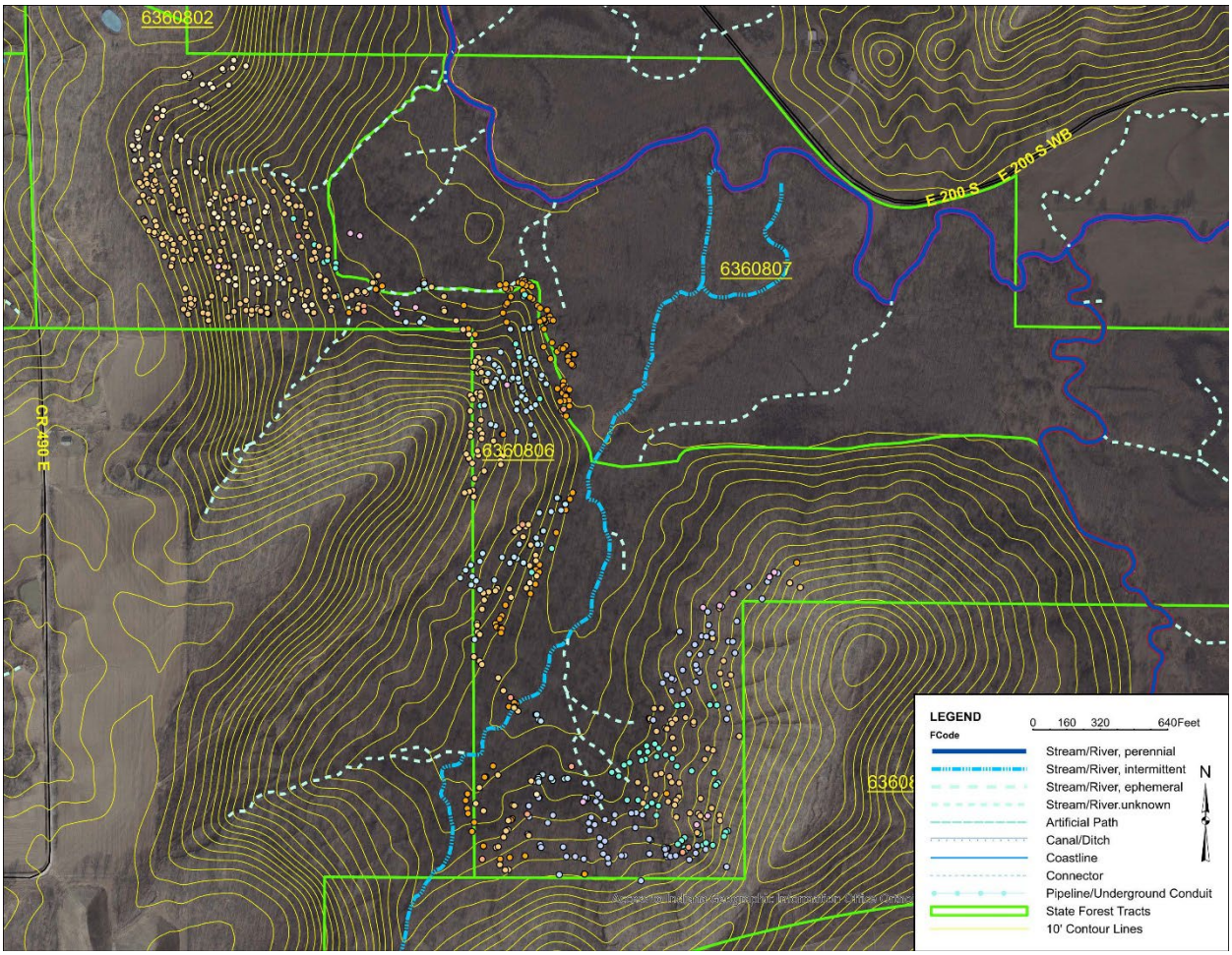
Results

Martin Compartment 8 Tract 6

This tract has a total acreage of 151 acres with 55 of those acres marked for the harvest. In the harvest area 964 trees, poles, and culls were marked for harvest, and 821 were accounted for in the audit for 85.17% accountability. A total of 38 of the 821 (4.6%) were standing marked poles, 38 (4.6%) were standing trees marked as saw timber, 28 (3.4%) were stumps that did not have marks on them, 4 (0.5%) were stumps that had no bark on them, 19 (2.3%) were standing trees marked as culls, 6 (0.7%) stumps were found marked as cull, and 688 (83.8%) were marked stumps.



The total number of trees and stumps found in the 2024 Martin State Forest stump audit.



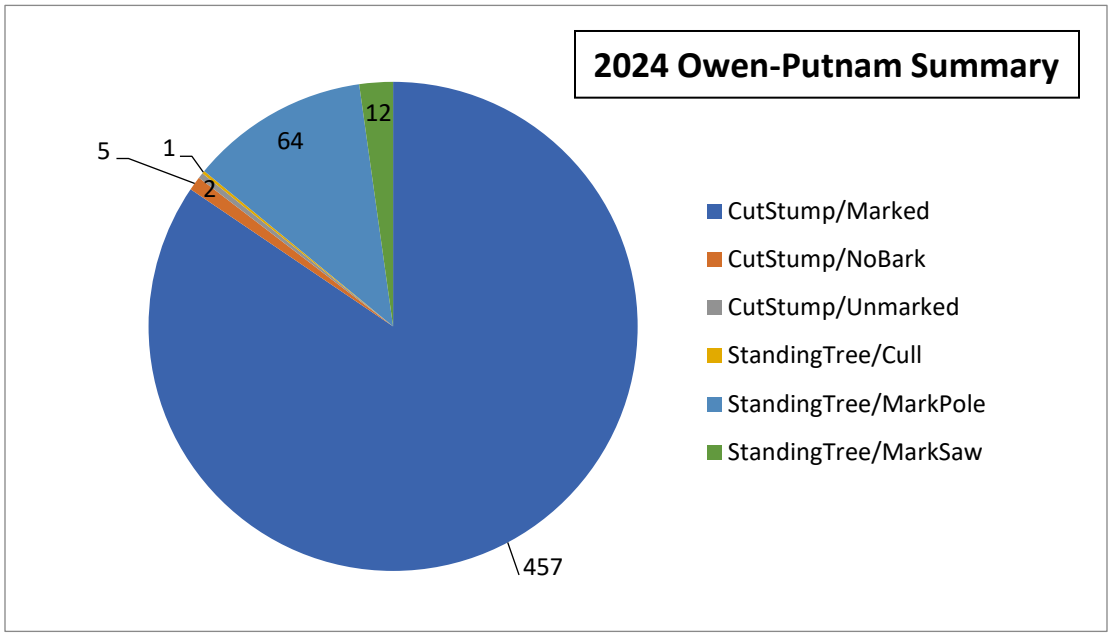
Map of standing marked trees and stumps found during Martin audit.

This site had challenges in that the marking of the trees started in 2018, then was sold on April 16, 2021. Forty-nine ash were marked, but only 35 (71.4%) were found—34 as cut stumps, and the other as a standing pole—so many of the others were likely standing but had sloughed off their bark along with the paint and thus were not found. . During and after the audit, a few participants mentioned that much of the paint was worn and hard to see, which might also explain finding only 108 (72.5%) White Oaks out of the 149 marked. . If we add the number of White Oak and Ash that were marked but not found to the number of found trees, the percentage found increases from 85.17% to 90.87%.

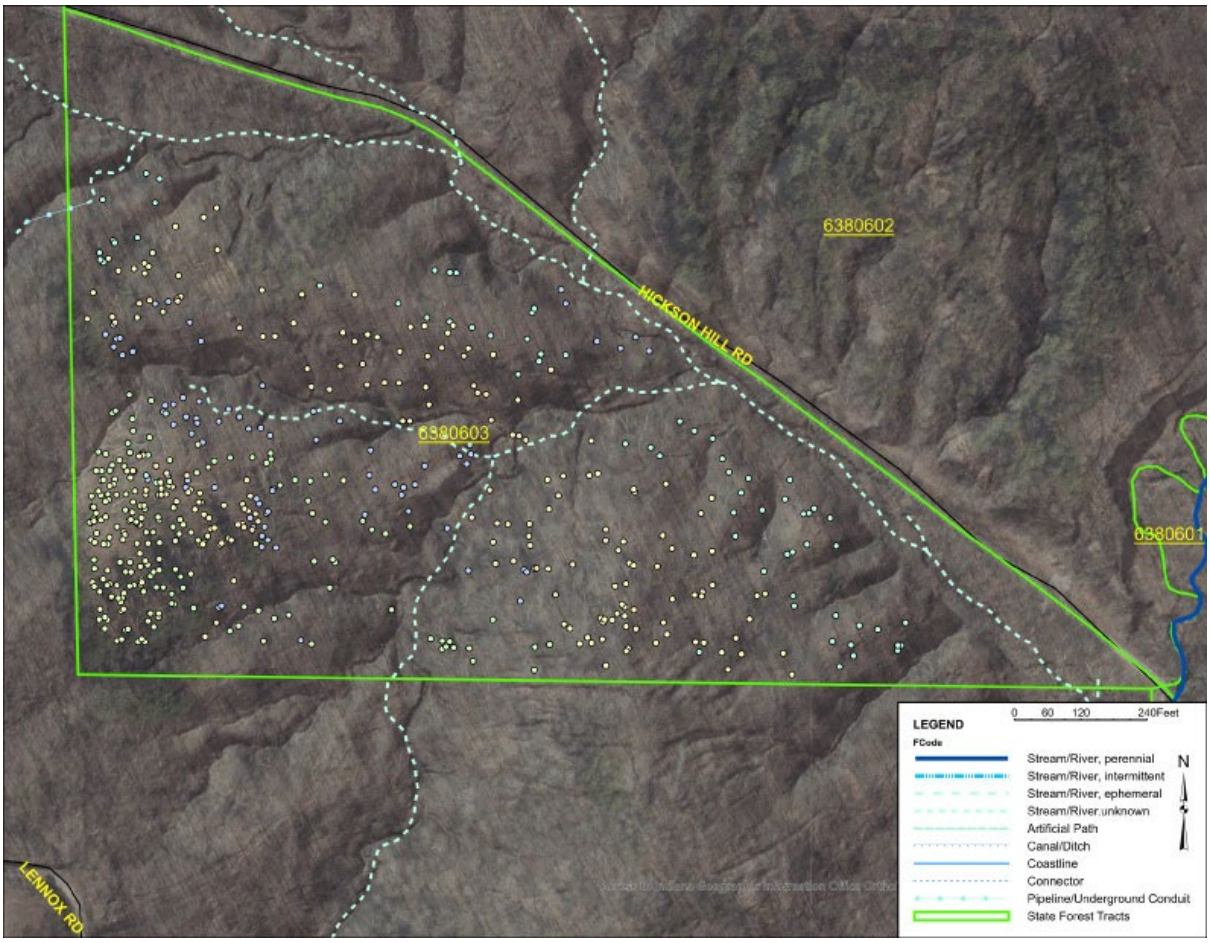
Marked stump (Picture by Duane McCoy)

Owen-Putnam Compartment 6 Tract 3

This site was a total of 32 acres with 25 marked for harvest. In the harvest area, we audited for 589 trees, poles, and culls that were marked for harvest, and 541 or 91.85% were accounted for. A total of 64 of the 541 (11.8.8%) were standing marked poles, 12 (2.2%) were standing trees marked as saw timber, two (0.4%) were stumps that did not have marks on them, five (0.9%) were stumps that had no bark on them, one (0.2%) was a standing tree marked as a cull, 0 (0.0%) stumps were found marked as cull, and 457 (84.5%) were marked stumps.



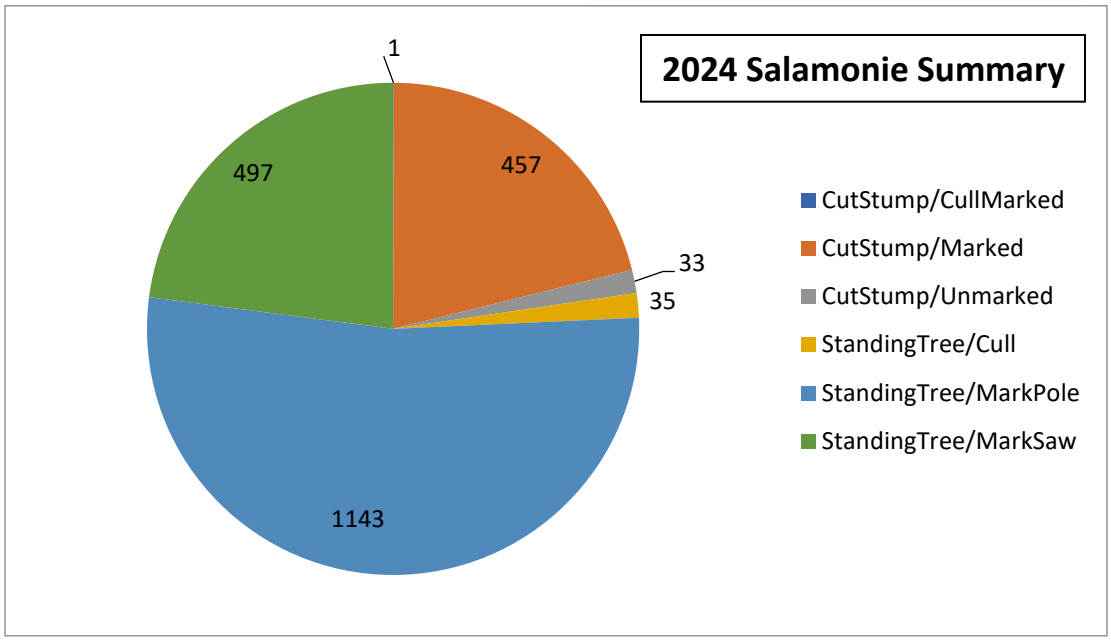
The total number of trees and stumps found in the 2024 Owen-Putnam State Forest stump audit.



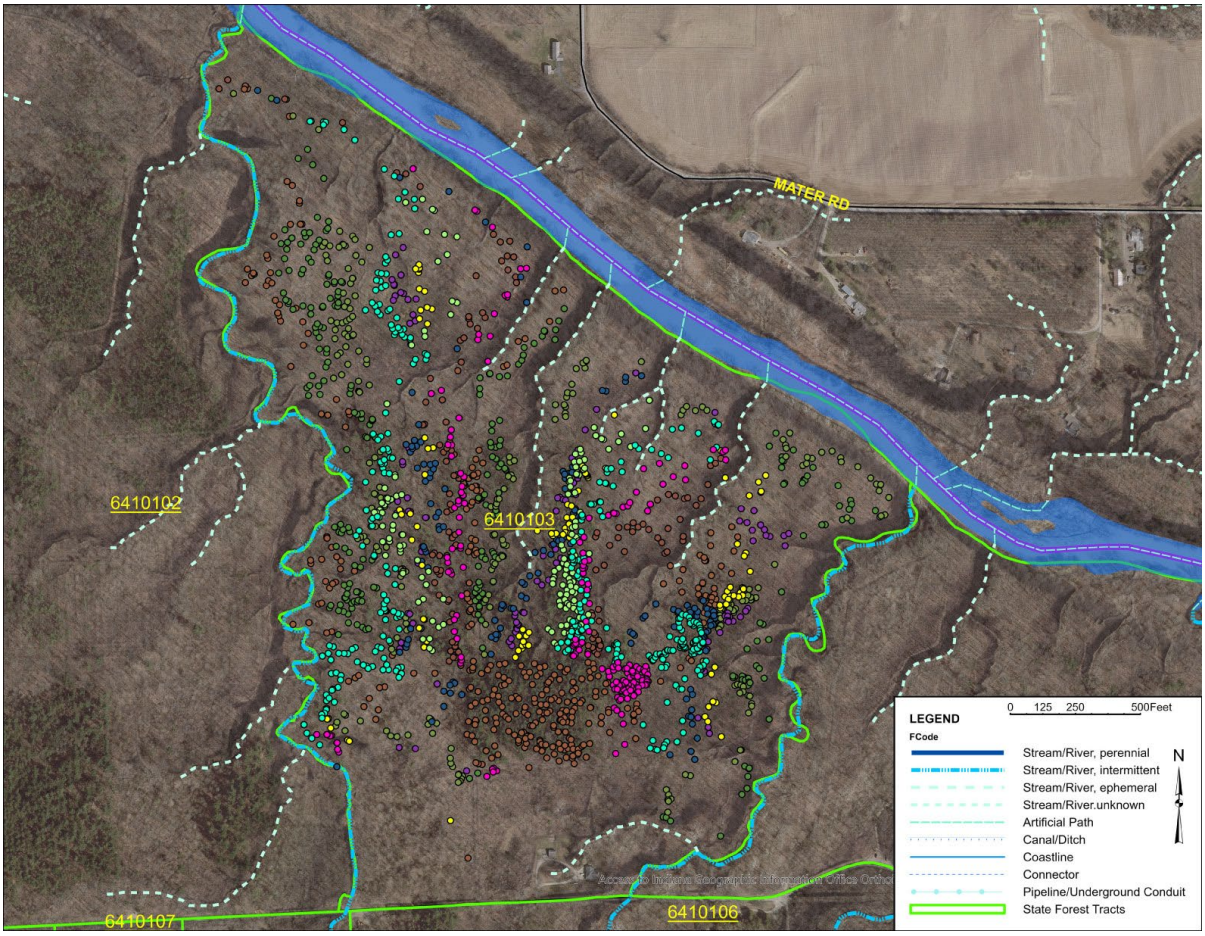
Map of standing marked trees and stumps found during a Owen-Putnam State Forest audit.

Salamonie Compartment 1 Tract 3

This site comprised 119 acres, 94 of which were marked for harvest. In the harvest area, we audited for 2,682 marked trees, poles, and culls, and 2,481 or 92.33% were accounted for. The data for 315 trees were lost, so we do not know how many fit in each category. As a result, the percentages for 2,166 audited trees are reported. A total of 1,143 of the 2,166 (52.8%) were standing marked poles, 497 (22.9%) were standing trees marked as saw timber, 33 (1.5%) were stumps that did not have marks on them, 0 (0.0%) were stumps that had no bark on them, 35 (1.6%) were standing trees marked as culls, one (0.05%) stump was found marked as cull, and 457 (21.1%) were marked stumps.



The total number of trees and stumps found in the 2024 Salamonie State Forest stump audit.



Map of standing marked trees and stumps found during Salamonie State Forest audit.

Auditors walking out of the woods at the end of the day. (Photo by Alicia Ariens)

Appendix

The product definitions listed below are designed to classify trees into several useful categories to help determine the existing condition of the forest and future needs. For the product categories, 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 diameter inside bark (DIB).

Q Quality saw timber trees are saw timber 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 diameter at breast height (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 defects in the butt log, but can have no major defect. There can be no internal decay in the butt log, which is found through sounding for punky wood or a hollow echo. Quality trees can have decay defect in the upper logs as long as it does not produce greater than 20% defect deduction. Saw log 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 have prime trees 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, cat faces, 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, found through sounding for punky wood or a hollow echo. Prime trees can have decay defect in the upper logs as long as it does not produce greater than 10% defect deduction. Saw log height is measured using 12-foot logs.

P Poles are considered to have no merchantable sawtimber volume and are in the 6 to 13-inch diameter class. Volume in poles is calculated in cords. Poles with a 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 to 1-inch class. No merchantable height measure is taken.

The leave and remove/harvest designations are used to determine the likely status of a particular tree when management activities occur in the area. This would include trees whose removal is recommended. A tree to be removed could be removed via several operations—timber stand improvement (TSI), logging, or 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 a combination of these.