

MICHIGAN



MICHIGAN STATE UNIVERSITY: Prevention of work-related injuries & illnesses through research & investigation

ARBORISTS: LOOK UP, STAY CLEAR & STAY SECURED

Hazard Alert: Arborists 3/24/20

In Michigan from 2001-2018, 80 individuals who worked in Landscape Services (NAICS 561730) died from work-related injuries. Figure 1 shows how these injuries occurred. Sixteen of the 80 arborists died when they or the equipment they were working in was struck by a falling tree or limb, 15 fell from the tree, and seven were electrocuted while working in the tree or on the ground.

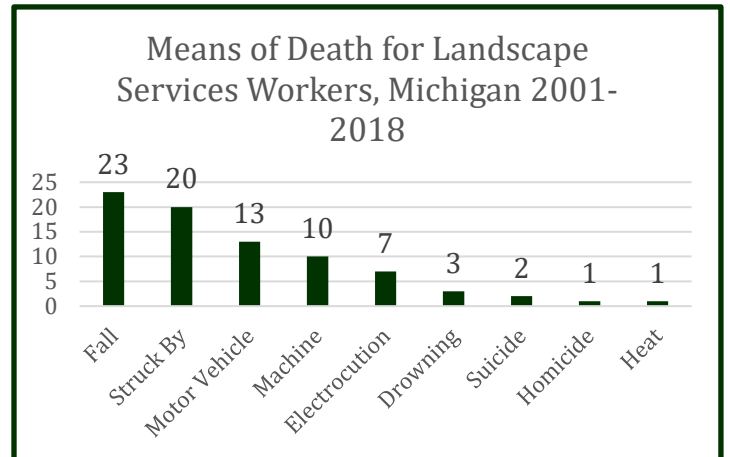


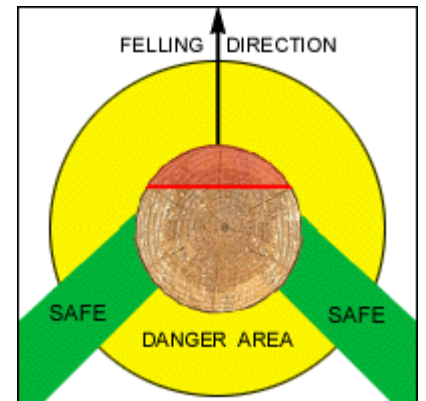
Figure 1

EXAMPLES OF WORK-RELATED FATALITIES FROM TREE WORK IN MICHIGAN

- A male tree trimmer in his 30s was struck and killed by a falling 35-40-foot tall while felling a white oak at a private residence. In preparation for felling, the crew had de-limbed the tree and the top had been cut off. A rope was tied from the white oak to a second tree about 25 feet away to assist with the felling. One coworker was using a saw to cut through the trunk of the tree. The decedent and the third worker were instructed to assist with the felling by pulling on the rope attached from the white oak to the second tree. Pulling on the rope directed the tree's fall to an open area but also in their direction. They were instructed to move to the left as the tree fell to avoid being hit by the falling tree. As the tree fell, the victim and the third coworker attempted to move to the left, however, the victim bumped into his coworker and began running in the opposite direction, which was into the path of the falling tree. He was not wearing a hard hat or safety glasses.
- A male journeyman tree trimmer in his 40s died from a 35-foot fall when the knot used to attach his climbing rope to his climbing saddle untied. The decedent and his coworker were performing line clearance tree trimming work in a residential neighborhood. A job briefing was held by the decedent and his coworker about the maple tree. The job briefing documented that all equipment and unique hazards had been assessed. After the job briefing, the decedent climbed the tree, set his rope, and trimmed his way down the front side of the tree using a chain saw and an insulated pole pruner. The ground man was in an adjacent yard throwing brush over the fence when he heard branches snapping and a loud "thud". Looking toward the sound, he saw the decedent on the ground. Subsequent investigation showed the Bowline knot the decedent had chosen to attach to his saddle had become untied because it had not been finished with an appropriately tied knot, or did not have a stopper knot on the tail end; the ends of all the ropes attached to the saddle had black electrical tape wrapped around the end except the end of the rope that had been tied to the saddle, which was frayed and had only remnants of electrical tape on the end.
- A male tree trimmer in his 20s died when his back contacted an energized C-phase 7,980-volt overhead power line. The decedent climbed the side of a pine tree which faced the power lines to trim branches that were located too close to the energized lines. The decedent was tied in and positioned approximately 17 feet above the ground with his back facing the power lines. He asked the grounds person for his insulated pruners. The grounds person bent over to pick up the pruners and then saw a flash of light. There had been heavy rain the night before the incident and the morning of the incident. Additional contributing conditions were the heavy tree canopy, green and oxidized power lines and tree branches touching the conductors.

PREVENTING INJURIES AND FATALITIES FROM TREE WORK

- **Assess worksite** to determine likely hazards.
- **Develop** a work plan.
- **Communicate** the work plan to all workers through a pre-work briefing (job briefing).
- **Establish a communication protocol** between arborists aloft and personnel working on the ground before commencing operations.
 - **Communicate** struck-by hazards through “**voice command & response**”: the climber should say, “Stay clear!” and ground workers acknowledge with, “All clear!” before trees or tree sections are allowed to fall.
- **Visually inspect the tree prior to work** including the root collar and immediate surrounding area to determine if the tree can stand the strain of climbing, rigging, or removal.
- **Set up** the work area to prevent intrusions.
 - **Establish a drop zone** (safe landing zone) when dropping or lowering trunks, branches, fruit or equipment
 - **Manual tree felling -Assign** work areas so that the distance between adjacent occupied work areas is at least two tree lengths of the trees being felled.
 - **Plan** a clear escape path. Never move away directly behind the tree
- **Use safe climbing procedures**, including but not limited to:
 - **Inspect all climbing equipment for damage**
 - **Stay secured at all times while performing work in a tree**
 - Place hands and feet on separate limbs.
 - Position tie-in point so the arborist will not be subjected to an uncontrolled pendulum swing
- **Identify required personal protective equipment**
- **Provide electrical hazard training as appropriate, including but not limited to:**
 - Consider all overhead and underground electrical conductors, guy wires, pole grounds and communication wires and cables energized
 - The human body is conductive and poses little resistance to electric current
 - Types of contact causing injury or death from electrical shock
 - Direct contact
 - Indirect contact (any part of body contacts conductive object. Woody parts of trees, leaves, branches, needles, etc., are conductive)
 - Step potential (when a person stands near an energized grounded object)
 - Simultaneous contact with two separate energized conductors (phase-to-phase)
 - How to distinguish exposed live parts from other parts of electric equipment
 - How to determine the nominal voltage of exposed live parts
 - Wear a Class E helmet conforming to ANSI Z89.1 when working near electrical conductors
 - Arborists not qualified by training and experience to work within 10 feet (3.05m) of electrical conductors shall maintain the minimum approach distance (MAD) at all times.
 - Use of non-conductive tools and ropes
 - When weather conditions require suspension of the work operation



DID YOU KNOW?

- ANSI Z133.1-2017 revisions include:
 - Specifies three levels of qualification and safety requirements for working in proximity to electrical hazards: Unqualified, Incidental Line Clearance Arborist and Utility Line Clearance Arborist
 - When repositioning, the arborist shall preload the new tie-in point with his/her full weight before releasing the old tie-in point.
 - Climber shall select a tie-in point/primary suspension point that prevents lateral movement of the climbing line.

Resources

- **MSU OEM**
 - [MIFACE](#) (Work-related Fatalities)
- **MIOSHA Resources**
 - Tree Trimming & Removal Standard, [Part 53](#)
 - Initiatives (Archived) [Tree Trimming](#) (Scroll down)
- **ANSI: Z133.1-2017 (rev) American National Standard for Tree Care Operations-Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush-Safety Requirements**
- **OSHA**
 - Infographic: [Solutions for Tree Care Hazards](#)
 - [Logging e-Tool](#)
- **Tree Care Industry Association (TCIA):**
<https://www.tcia.org/>