Tree Campus USA

Western Michigan University

Application submitted by WMU Facilities Management Landscape Services
December 2016
Since 2008, Western Michigan University has been a proud recipient of the Tree Campus U.S.A. designation. It takes a great many people, staff, students, faculty and administrators, all dedicated to the health and welfare of trees, to develop and implement the information and projects that make this honor possible.

A special “Thank You” goes to our outgoing University President, Dr. John Dunn. President Dunn’s focus on Campus Sustainability and his unwavering support of Tree Campus USA and Arbor Day has helped our community focus on the health and diversity of campus trees in every task that is undertaken on the WMU campus. Our campus community also extends happy retirement wishes to our long serving Landscape Services director, Tim Holysz, whose leadership provided the opportunity to become the first University in the state of Michigan to receive the Tree Campus USA honor. We also must bid farewell and happy retirement to our senior arborist of over 30 years, John Disbro whose service and education in support of Trees throughout the Kalamazoo region is legendary, his professionalism and work ethic will be missed by all of us in Landscape Services!

Sincere appreciation to all the professionals in the WMU Landscape Services Department for the work they do every day to make this campus safe, clean and beautiful. The honor of a Tree Campus U.S.A. designation is a point of pride for the Landscape staff that is dedicated to the stewardship of this campus and the celebration of trees for the many benefits they provide. A hearty Bronco Welcome to our new Landscape Director, Mark Frever, we look forward to his direction and vision when it comes to campus trees.

There was a great deal of excitement here at WMU in 2016, not the least of which was our perfect season in Bronco football that lead our team to the Cotton Bowl! Go Broncos! Excitement too was generated at the news of a Student Sustainability Grant that will fund the addition of trees, shrubs and educational signage around the newly renovated Goldsworth Valley pond in 2017.

Work continues on restoration of the unique Dwarf Hackberry (Celtis tenuifolia) Savanna here on campus. The identification, inventory and preservation of these uncommon Michigan trees, including the Michigan state champion, has been a successful partnership between faculty, staff, students and volunteers. Continued removal of invasive species is revealing a lost landscape reminiscent of pre-settlement Kalamazoo.

The creativity and determination of Broncos was once again celebrated in an innovative project that uses goats to clear understory invasive vegetation from campus woodlots. This inexpensive, low impact sustainable method, is yet another tool for Landscape Services to manage our woodland resources here at WMU. The pilot project in 2016 was so successful and well received by the campus community, that goats will return in 2017 to help our staff steward our natural resources.

WMU celebrated Arbor Day this year in close partnership with the City of Kalamazoo. Two trees were dedicated on campus and one in a city park. The event was well attended by University and City representatives.

With all the good news we cannot overlook the continued threat to trees on Campus and beyond. Development, disease and damage have taken their toll on campus trees resulting in the loss of significant individuals as well as campus canopy cover. The standards and protocols of Tree Campus USA give us framework in which we can work to help limit the unnecessary loss of our Natural heritage and campus tree assets.

We hope this publication of the WMU Tree Campus U.S.A. application will inform, educate and foster an appreciation of the value of trees. We hope you will agree that healthy, beautiful trees play an important part in campus sustainability and student recruitment and retention here at WMU.

Steve Keto, Natural Areas and Preserves Manager
Steve.keto@wmich.edu
Western Michigan University
Tree Campus USA

Standard 1: WMU Tree Campus USA Policy and Standards Committee

Mission Statement: The WMU Tree Campus USA Policy and Standards Committee’s purpose is to celebrate trees and demonstrate a commitment to the preservation and protection of trees. The committee shall be involved in the planning process of campus construction projects and provide expertise related to tree risk assessment, selection, placement and valuation. The committee is entrusted with enforcing the Tree Care Plan and Policy outlined in this document and educating the campus and local community as to these standards.

Organization: The Western Michigan University Tree Campus USA Policy and Standards Committee was established as part of the Tree Campus USA initiative developed by the National Arbor Day Foundation. The committee consists of members of the faculty, staff and student groups and includes a representative of the wider Kalamazoo Community. The committee shall meet a minimum of twice per year, and additionally as needed.

Roles of the Committee Members: The committee members will serve a term of one year with option to renew. Members shall select a chairperson from the committee. The chairperson shall establish meeting times, moderate the meetings, and assign tasks related to the committee’s work. All members are expected to be engaged in the work of the committee and endeavor to attend all meetings in person or by proxy.

Tree Campus Advisory Committee Meetings: April 1, 2016 and October 12, 2016
Members: WMU Faculty and Staff

Dr. Todd Barkman, WMU Professor, Biological Sciences
todd.barkman@wmich.edu

Dr. David Lemberg, WMU Professor, Geography
david.lember@wmich.edu

David Dakin, WMU Director Campus Planning and Architecture
david.dakin@wmich.edu

John Disbro, WMU Landscape Services Staff/Certified Arborist
john.disbro@wmich.edu

Darrell Junkins, WMU Landscape Services Supervisor/Certified Arborist
darrell.junkins@wmich.edu

Steve Root, WMU Landscape Services Supervisor/Certified Arborist
steve.root@wmich.edu

Mike Taylor, WMU Landscape Services Gardener/Certified Arborist
michael.j15.taylor@wmich.edu

Steve Keto, WMU Natural Areas Manager
steve.keto@wmich.edu

Tom Sauber, WMU Landscape Services Manager
tom.sauber@wmich.edu

Nick Gooch, WMU Landscape Services Horticulturalist, Certified Arborist.
nicholas.j.gooch@wmich.edu

Nathan R. Scharrer, WMU landscape Services, Certified arborist
nathan.r.scharrer@wmich.edu

Mark Frever WMU Landscape Services Director
mark.frever@wmich.edu

Pauly Gourley, WMU Landscape Services, Grounds Parkview
paul.gourley@wmich.edu

Members: City of Kalamazoo Staff
Todd Pryor, Kalamazoo City Forester/Certified Arborist
pryort@kalamazooicity.org

Mark Polega, Kalamazoo City Parks and Recreation
polegams@kalamazooicity.org

Members: WMU Student
Benjamin William Giese
benjamin.w.giese@wmich.edu

Louis Joseph Mitchell
louis.j.mitchell@wmich.edu
Standard 2: WMU Tree Care Plan and Policies

PURPOSE
The purpose of the Western Michigan University Tree Care Plan and Policies is to define protocols and give guidance and direction as to the best practices for any developments affecting woody plants on campus. This plan will be used by the Landscape Services Department, Campus Planning Department and the WMU Tree Campus USA Policy and Standards Committee in executing any of the landscape projects on University properties. The Plan and Policies outlined below are in-line with other major University campuses around the country and adherence to them will help to ensure that we maintain a safe campus environment while protecting the natural heritage of the State of Michigan at the same time.

AUTHORITY
Implementation and enforcement of the Tree Care Plan and Policies and best management practices involving existing and future campus plantings and landscapes resides with the professional staff of the Western Michigan University Landscape Services Department.

WMU TREE CAMPUS USA POLICY AND STANDARDS COMMITTEE
The committee is comprised of community members as well as WMU faculty, staff and students from several academic and operational departments around campus. A subcommittee, made up of WMU faculty and staff, meets more regularly when needed to discuss ongoing projects. The committee has been working to have the tree care plan and policies officially adopted by the University.

PROTOCOL FOR CAMPUS DEVELOPMENT PROJECTS AFFECTING THE LANDSCAPE

1. Prior to site design, the Director of Landscape Services will appoint a subcommittee of the WMU Tree Campus USA Advisory Committee. This subcommittee must be consulted to ensure that campus planning activities are aligned with the Tree Care Plan and Policies.
2. Prior to the start of construction, the committee will review plans and develop tree protection strategies.
3. Prior to start of construction, the committee will develop mitigation strategies for on-site woody plants, if deemed necessary. This will include a monetary valuation of trees and initiating a dialogue with goal of maximizing the value of the campus landscape and minimizing the costs of construction.
4. During the project, the committee will monitor and oversee adherence to planting specifications and tree protection strategies. Violations of any construction agreements will result in financial offset to be paid from project funds.
5. After construction, a representative from the committee will be involved in the final project walk-through and will monitor the plantings covered throughout the warranty period. Plantings that do not meet the Landscape Services specifications throughout the contractor’s warranty period will have to be replaced per the agreed upon contract.

Tree Damage Assessment
This Landscape Services Department works closely with campus planning and vendors to assure that any damage to trees is quickly identified and remediated. Funds from construction projects will be used as an offset for damages incurred to trees on campus during development projects. The amount of damage caused would be assessed and determined by WMU Landscape Services arborists using the 9th Edition for Plant Appraisal, developed by The Council of Tree and Landscape Appraisers and The Michigan Tree Evaluation Supplement. Additional money can be used for research, management or future landscape projects that would further the standards and goals of the WMU Tree Campus USA Policy and Standards Committee.
TREE CARE POLICIES

Plant Selection: Specific plant selection is made by the professional staff of WMU’s Landscape Services Department. Plant material provided to WMU will be true to name as confirmed by Manual of Woody Landscape Plants, Michael A. Dirr, Sixth Edition, 2009. Plant material should be from USDA hardness Zone 5.

The key goal of tree selection is diversity. Trees are selected, both exotic and native, based on site conditions. Locations are selected after consulting the Campus Master Plan. Invasive or problematic species are strongly discouraged. The department consults with the Michigan Invasive Plant Council for information on invasive plants. The department also reviews contracted landscape design proposals and recommends changes as to tree selection and location when necessary.

All shade or street trees will have comparatively straight trunks, well developed leaders, tops, and roots and will be characteristic of the species, cultivar or variety. They will exhibit evidence of proper nursery pruning practices, have acceptable balance between top and root and be free of the above objectionable features that may affect the future form and beauty of the tree. The minimum acceptable shade tree caliper will be 2.5” as measured 6” above ground. Ball size will conform to ANSI Z60.1 specifications.

Planting: Trees, shrubs and planting beds shall be planted after final grades are established and prior to planting/seeding of lawns, unless otherwise acceptable to the Director of Landscape Services or Landscape Services staff representative. If planting of trees, shrubs or planting beds occurs after lawn work is completed, lawn areas shall be protected and any damage done to lawn areas as a result of planting operations shall be promptly repaired.

No planting will be performed when the ground is frozen unless approved by Director of Landscape Services or Landscape Services staff representative.

Balled and Burlaped (B&B) Plants:
- Set plants in planting hole to proper grade and position and face plants to give the best appearance, relationship with other plants and relationship with adjacent structures. Plants shall be set on undisturbed soil, plumb and in the center of the excavated planting hole.
- Remove wire baskets to a depth of one-half (1/2) the depth of the ball and remove burlap and rope from the top of the ball.
- Place planting mixture around root ball to a depth of one-half (1/2) the height of the root ball. Settle the soil and fill voids around the root ball by watering. Remove burlap and ties to a depth of 1/2 the depth of the ball.
• After the water has been absorbed, fill the remainder of the planting pit, up to grade, with planting mixture. Water again after placing final layer of backfill and form a watering saucer from planting soil mixture when the plant is isolated.

To provide natural drainage in heavy or compacted soils, root ball must be elevated slightly above grade and planting mixture used to create a mound around the root ball.

Container-grown plant material:
• Container-grown stock will be planted as above specified for B&B plants. Remove containers before planting in a manner which will not damage the root ball.

Vertically severing or slicing the sides of the root mass will not be necessary as pot bound container material will not be accepted.

Bare-root plant material:
• Sever damaged roots with a clean, sharp pruner before planting.
• Bare-root stock will be planted so that the roots are arranged in a natural position and planting mixture carefully worked-in among roots. Settle the soil and fill voids around the roots by watering.

Form a watering basin from planting mixture.

Trees Planted with a Tree Spade
• Sever damaged roots with a clean, sharp pruner before planting.
• In heavy soils, the sides of holes dug with a tree spade shall be scarified with a shovel or spade to encourage root penetration into surrounding soil.
• The area outside the root plug and within an area three-times (3X) the plug diameter will be tilled and to a depth of 8". A layer of compost, 3"-5" in depth will be evenly spread over the planting site, 3x the root plug diameter, and tilled a second time as above. Care will be taken not to till the tree-spaded root plug.
• Settle the soil and fill voids around the roots by watering thoroughly.

Form a watering saucer from planting soil mixture around the perimeter of the tilled planting site (3x the root plug diameter).
**Mulching:** Mulching shall take place within 48 hours of plant installation. Trees and shrubs will be mulched to a depth of 3” over each individual planting site and will not be placed within 6” of tree trunks. Keep mulch off sidewalks, curbs, light standards and other structures.

**Wrapping:** Unless specified by the Director of Landscape Services or Landscape Services staff representative, the trunks of deciduous trees shall not be wrapped. If the Director of Landscape Services or Landscape Services staff representative specifies that individual trees need to be wrapped, the material used will be waterproofed crepe paper not less than 2 ½” wide, made up of two layers of crepe craft paper weighing not less than 30 pounds per ream and cemented together with asphalt. When wrapping, begin at the base of the tree and extend wrap up to the first lateral branches. The wrap shall be applied in a spiral manner with an overlap of one-half the width of the paper. The specified twine shall be used to hold wrap in place and will only be tied tightly enough to keep the paper from sliding down the trunk. Twine will be secured both at the top and bottom and at 18” maximum intervals in between.

**Staking:** In general, trees are not staked if their soil ball is firm. The moving of the stem in the wind makes for a stronger tree. If guying is necessary, non-abrasive strapping arbor tie is used, so as not to constrict the stem. Stakes should be 6’ hardwood 2”X2”. Guying remains on the tree for 12 to 18 months and any wires are flagged for safety.

**Pruning:** Campus trees are maintained by two certified arborists. The pruning techniques employed include natural target pruning, as developed by the late Dr. Alex Shigo, and structural pruning as developed by Dr. Ed Gilman. Trees are generally pruned on a three to four year cycle with damaged or pre-determined hazard trees taking priority.

**Transplanting:** When necessary, due to construction, trees are moved to new locations. The WMU Landscape Services department’s arborists are responsible for site selection and method of transplanting. Tree spades, air spades and balled & burlaped are the preferred methods of moving trees.

**Fertilizing:** The WMU Arborists refrain from using synthetic fertilizers for trees. Soil fertility is improved by the breakdown of mulch, inoculation with mycorrhizal fungi and organic sources. Individual nutrients can be added by soil or trunk injection if shown by soil testing to be deficient. WMU Landscape Services uses ANSI A 300 (Part 2) and the best management practices on tree and shrub fertilization (International Society of Arboriculture, ISA) as guides.

**Storm Management and Hazard Tree Assessment:** In the event of a storm or condition that results in fallen trees and tree damage the first line of defense are the public safety personnel who patrol the campus 24 hours/day, seven days a week. When damaged trees are discovered, the Public Safety Department contacts the Director of Landscape Services or subordinate personnel who, in turn, assess the situation and decide what landscape personnel and equipment are required. The WMU staff arborists are responsible for assessing the safety of the situation and removal of the trees to alleviate hazards and clear roads and walks.

The Landscape Services department’s certified arborists are responsible for assessing campus trees for hazard potential. The arborists use techniques and equipment, both old and new (sounding and resistograph), to evaluate trees. They also use visual tree assessment techniques as developed by leading researchers.
TREE PROTECTION POLICIES
The Department of Landscape Services has developed concise guidelines to protect our campus landscape and accommodate the work of the University.

Damage to WMU-owned trees, shrubs, and other plant material due to contractor negligence or accident shall be repaired only by the staff of WMU Landscape Services Department, or their designated contractor. Landscape Services shall remove and replace any trees, shrubs and other plant material determined to be excessively damaged due to prohibited practices. The costs of all such repairs, removals, replacements, and an amount of value lost will be the liability of the contractor and billed accordingly.

The following specific responsibilities are required of the contractor when marked:
• To protect the immediate portion of tree root zones, NO construction equipment or materials; sand, soil, gravel, or any other materials shall be placed, parked, or stored on the surface of any unpaved areas within the radius of one and a half times the drip line (outermost reach of branches referred to as protected zone) of trees. NO chemicals, rinsates, or petroleum products shall be deposited within the protected zones of trees.
• Tree protection barricades shall be erected to define the protected zones (see attached tree protection dia gram). All unpaved area within the zones of each tree in the construction site shall be fenced. The fencing shall be installed by Landscape Services or contractor as specified prior to set-up for construction.
• It is understood that the proximity of a tree to a worksite may require temporary access to a protected zone. A temporary path may be constructed in these cases with prior approval from the Director of Landscape Services or Landscape Services staff representative. To preserve viable root systems and maintain structural stability, it is required that the contractor bore or tunnel beneath the root systems of trees. Open-cut excavating is allowed only up to the distance from various size trees, as listed below. You must bore or tunnel from trench to trench below the minimum depth indicated for the tree size. The surface area and subsoil directly adjacent to trees shall not be disturbed as follows:

<table>
<thead>
<tr>
<th>Tree Size (diameter/inches)</th>
<th>Minimum Undisturbed Radius (measured from face of trunk)</th>
<th>Minimum Depth of Tunnel/Bore</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 3”</td>
<td>3 feet</td>
<td>3 feet</td>
</tr>
<tr>
<td>3” through 8”</td>
<td>8 feet</td>
<td>3 feet</td>
</tr>
<tr>
<td>8” through 14”</td>
<td>14 feet</td>
<td>4 feet</td>
</tr>
<tr>
<td>larger than 14”</td>
<td>20 feet</td>
<td>4 feet</td>
</tr>
</tbody>
</table>

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![Tree Image]

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![Construction Site Image]
A pre-construction site walk-thru will be scheduled with the Director of Landscape Services or Landscape Services staff representative and contractor prior to any construction being done. This meeting will include the site construction superintendent and a representative of WMU Landscape Services.

- Care shall be taken not to damage tree trunks and branches. The WMU Landscape Services Department shall be contacted at least three (3) business days prior to the set-up for any construction to discuss problems of overhanging branches which may be damaged.
- All excavation in the protected zone shall be backfilled only with clean, viable soil. If possible, native soil from the site should be returned, and if not possible soil returned should match existing soil profile. NO concrete, slurry, gravel, stone, sand, or other such materials shall be used for backfill. Flush backfilled excavations to settle material. Restoration shall be to original grade, unless otherwise specified.

GOALS AND TARGETS
WMU Landscape Services will be building on our tree inventory database by adding monetary values and hazard classifications to trees on campus. The Department will also begin to list highly sensitive areas on campus that contain trees of high historic value. These areas will then be mapped and used to guide activities that may impact the trees.

Landscape Services has developed a Landscape Services Master Plan coordinated with the Western Michigan University Campus Master Plan. The purpose of the Landscape Services Master Plan is to provide guidance for future campus landscape planning and design which will ultimately enhance the quality of life on campus and in adjacent communities, increase the sustainability and ecological health of the campus landscape, and create a more uniquely defined image for Western Michigan University. The plan outlines goals such as managing campus woodlots for ecological health, increasing sustainability of campus by choosing plants/trees which require less maintenance and using more efficient technology, and choosing native species when feasible.

TREE DAMAGE ASSESSMENT
The Landscape Services department employs certified arborists charged with the responsibility of assessing tree damage. Tree value is determined by current market value per 1” DBH. Where applicable, large trees are valued using the 9th Edition for Plant Appraisal, developed by The Council of Tree and Landscape Appraisers and The Michigan Tree Evaluation Supplement.

PROHIBITED PRACTICES
Our guidelines were developed by the arborists and are part of our landscape specifications sent out to landscape contractors bidding on University projects.

“Prohibited Practices” by contractor shall include:

- Breaking of branches, scraping of bark, or unauthorized cutting
- Nailing or bolting into plants; use of plants as temporary support (i.e., cables)
- Chaining, bolting, or cabling equipment to trees
- Unauthorized filling, excavating, trenching, or auguring within protected zone
- Compaction/driving over the protected zone
- Storage of any materials or vehicles within the protected zone
- Dumping of construction waste or material (including liquids)
- Unauthorized removal or relocation of woody plants
DEFINITIONS OF TERMINOLOGY
The glossary of arboricultural terms, published by the ISA (International Society of Arboriculture) in 2006 is the definitive guide we use to define tree terms. Additionally, some terms are explained in the WMU Campus Woody Plant Protection Definitions document developed by Landscape Services. Terms are defined below.

“Landscape Services Arborist Responsibilities”
- Tie-back of existing trees and shrubs
- Pruning/thinning
- Root pruning and root protection of exposed roots
- Watering of existing trees under stress
- Removal or relocation not specified within construction documents

These measures shall be done only by Landscape Services arborists, unless otherwise arranged, as needed to provide either preventative or remedial care to plants on a construction site.

“Construction Fencing”
NO construction work, parking of vehicles, storage of materials, or related activities shall occur beyond this boundary fencing. Construction fencing shall be chain link, unless otherwise agreed upon.

“Tree Protection Barricade”
Shall be defined as wood rail fencing constructed of 4”x4” posts at eight feet (8’) maximum on center, and three 2”x4” (or better) wood rails; lined with at least one four foot (4’) tall snow fence (or similar approved construction barrier fencing) which meets existing grade and encircles the entire area. Standard height of top rail shall be eight fee (8’); for variations, refer to site drawings. Failure to install barricades as directed may halt work and plant damage occurring within installed barricades does not absolve contractor from “damage” assessment.

“Temporary Path”
If required, shall be defined as a zone within the specified protected zone of a tree to enable temporary movement of equipment. It shall be eight to ten inches (8-10”) of wood chips as located by the Landscape Services arborist or designated representative. Wood chips shall be removed immediately upon completion of work in an area; soil aeration may be required during site restoration.

COMMUNICATION STRATEGY
Landscape Services will be working with various departments to inform them of the uses for this document. Upon official adoption, the plan will be published on our website and will be publicly available. We will also include information from this plan in our Landscape Services Specifications which will be given to contractors prior to the start of construction projects.
Standard 3: WMU Dedicated Annual Expenditures and Statistics for Campus Tree Program (through December 31, 2016)

2016 Annual Expenditures:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Planting (plant materials only)</td>
<td>$13,825#</td>
</tr>
<tr>
<td>Tree Management Costs (staff compensation, supplies and equipment)</td>
<td>$306,882</td>
</tr>
<tr>
<td>Volunteer Time, Student and Civic Organizations 5000 hr. X $18/hr.</td>
<td>$90,000</td>
</tr>
<tr>
<td><strong>Total Annual Expenditures</strong></td>
<td><strong>$410,707</strong></td>
</tr>
</tbody>
</table>

# Trees purchased by Landscape services only, this does NOT include trees purchased by contractors for projects

2016 Additional Campus Tree Details:

<table>
<thead>
<tr>
<th>Site</th>
<th>Trees Removed*</th>
<th>Trees Planted**</th>
<th>Balance as of 12/31/16</th>
</tr>
</thead>
<tbody>
<tr>
<td>All WMU Campus</td>
<td>62</td>
<td>159</td>
<td>+ 97 ***</td>
</tr>
</tbody>
</table>

*These numbers represent all trees removed for all reasons, plant health, customer safety, construction.

**These numbers represent all trees planted by WMU staff and contractors.

***Due to construction in 2015 the number of trees planted minus trees removed was –30 (less trees planted than removed) The Student sustainability grant received in 2016 should help to close this gap in 2017 by adding additional trees over base budget.
**Standard 3: WMU Dedicated Annual Expenditures and Statistics for Campus Tree Program (through December 31, 2016)**

**WMU Campus Tree Canopy Cover Details 2016**

<table>
<thead>
<tr>
<th>Site</th>
<th>Total Acres</th>
<th>Canopy Acres 2015</th>
<th>Canopy Acres 2016</th>
<th>% Canopy Cover 2016</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>WMU Main campus</td>
<td>618</td>
<td>131</td>
<td>130</td>
<td>21.0 %</td>
<td>-0.2%*</td>
</tr>
<tr>
<td>WMU Parkview Campus</td>
<td>182</td>
<td>36</td>
<td>36</td>
<td>19.8 %</td>
<td>0</td>
</tr>
<tr>
<td>Kleinstuck Preserve</td>
<td>48</td>
<td>35</td>
<td>34</td>
<td>70.8 %</td>
<td>-0.7% **</td>
</tr>
<tr>
<td>Asylum Lake Preserve</td>
<td>274</td>
<td>109</td>
<td>109</td>
<td>39.8 %</td>
<td>0</td>
</tr>
<tr>
<td><strong>Grand Totals</strong></td>
<td><strong>1122</strong></td>
<td><strong>311</strong></td>
<td><strong>309</strong></td>
<td><strong>27.5 %</strong></td>
<td><strong>.2 %</strong></td>
</tr>
</tbody>
</table>

* Goldsworth Valley Pond storm water detention basin construction

** Removal of invasive shrubs from native sedge meadow
**Standard 4: WMU Arbor Day Observance**

**Arbor Day:**  WMU has observed Arbor Day for 11 consecutive years, from 2006 to 2016. Celebration activities include the planting and dedication of a tree on campus, a presentation on the history of Arbor Day, natural and cultural history of the Arbor Day Trees Burr Oak (\textit{Quercus macrocarpa}) and Red Oak (\textit{Quercus rubra}) and comments by WMU administration.

**Communication Strategy:** Arbor Day celebrations are publicized through two campus newspapers, “The Western News” and “The Western Herald”, as well as the WMU website and flyers posted on University Information boards. The week prior to the celebration the staff created a Tree Campus USA display in the WMU Student Center entrance display case.
WMU Arbor Day Celebration, April 29, 2016

Burr Oak (*Quercus macrocarpa*)

Red Oak (*Quercus rubra*)
**Standard 5: WMU Educational Involvement & Service Learning Projects**

**Sustainability Grant Goldsworth Vally Pond Plantings**

The summer of 2016 brought many improvements to our Goldsworth Valley Pond area including gardens and buffer strips of native wildflower and grasses. A Western Michigan University student, Annalis Wilder, was chosen the recipient of a grant from our Office For Sustainability. Her proposal which specified native plantings along with signage and a new plant walking tour will begin in the Spring of 2017. The plant list was created in conjunction with our Landscape Service professionals and the grant will support several mass plantings of shrubs and trees which will be a wonderful addition to an already great site improvement.

**Asylum Lake Preserve Ecological Management:**

The Asylum Lake Policy and Management Council in cooperation with WMU Landscape Services, has hired a professional ecological restoration company to accomplish management goals in the Asylum Lake Preserve. Crews have been selectively removing and treating invasive plants in the woodland understory over the last few years and burn this brush when conditions are favorable under permit from the Kalamazoo Fire Marshall. This is the sixth consecutive year of intensive management techniques aimed at improving the ecological condition of the preserve. Over 54 acres of Oak woodland have been managed thus far. The preserve is an important natural area asset of campus but is also a valuable part of the wider Kalamazoo community and is frequently used by many residents. Additional work at the preserve in 2016 included invasive species management in a savanna restoration unit and planning for prescribed prairie burn in 2017.

**WMU Woodlot Tree Inventory:**

Starting in the Winter of 2013 WMU Natural Areas and Preserves program embarked on an ambitious project to identify, measure and GPS campus woodlot trees. The goal of this inventory is to provide baseline data on the diversity, distribution and sizes of WMU campus tree assets. This data can be used by Campus Planning to adjust the footprint of new construction in order that valuable and heritage trees can be saved for future generations. In addition the data can be used by Professors and students to enhance education in the biological and environmental sciences. Currently 14% of main campus woodlots (19+ acres) have been surveyed with over 3000 trees mapped. This project has identified many campus trees of significant size, age or species and is providing data critical for future woodlot management plans.

Inventory work has revealed a population of two state threatened plant species Stiff Coreopsis (*Coreopsis palmata*) and Lesser Ladies Tresses Orchid (*Spiranthes ovalis*). Success with this project has prompted the University to consider a Natural Features Inventory of all Campus properties.

**Dwarf Hackberry (*Celtis tenuifolia*) Savanna Restoration:**

Through the work of WMU Biology Professor Dr. Todd J. Barkman and his students, the first recorded population of Dwarf Hackberry (*Celtis tenuifolia*), in Kalamazoo County was discovered on a woodland site located behind a campus apartment complex and student community gardens. This tree is listed as a species of special concern in Michigan with limited specimens found this far north. Once associated with the now rare Burr Oak savanna, this tree of the open woodland has been slowly surrounded by a forest of invasive species and larger trees that will eventually shade out these rare individuals. One tree in this WMU population was determined to be the Michigan State champion of this species. In cooperation with the WMU Natural Areas Program and Dr. Todd Barkman volunteers from Students for Sustainable Earth, and First Year Experience have sponsored work days to remove additional invasive species and restore an example of Kalamazoo oak savanna.
Goats as a Tool for Woodlot Management

With the ongoing change and development to the campus landscape, campus woodlots are continuously facing difficulties trying to maintain balance of habitat with attack from opportunistic invasive plants that thrive in disturbed environments. Being concerned for the long term health of our forested areas, the WMU landscape staff has spent countless hours over the years using every tool in our arsenal to manage these areas including machinery, chemical herbicides and manual labor. These efforts often produced short term results but failed to provide a long term sustainable solutions of site improvement and habitat restoration. Due to the difficulty of the current practices the landscape services staff started researching the viability of introducing animals into campus woodlots for management of these problematic invasive species.

In May of 2016 approximately 12 goats were contracted to spend a week eating and disturbing the thick understory growth that plagues campus woodlots. Initial estimates showed the animals had both a financial and environmental benefit over conventional management means. Furthermore this was the first example of using animal labor in the campus landscape and one of the few documented tests of this nature in the state of Michigan. The results were satisfactory and from both a production standpoint and campus and community outreach. Several news outlets and community members were present to see the work being done and to ask questions and get more educated about this new management strategy. With such a favorable community response and benefits the animals bring to woodlot management, WMU landscape services has funding and plans to bring goats back in 2017 to graze an additional 17 acres of campus woodlots that suffer from thick underbrush and invasive species. Future plans include partnering with various academic department to integrate a research component.

Native Plant Propagation

Since 2012 the WMU Natural Areas and Preserves has partnered with The WMU Biological Sciences Finch Greenhouse to engage faculty, staff, students and volunteers in harvesting, sowing, germinating and transplanting of native perennial wildflowers, grasses, trees and shrubs here on campus. With the generous support of Chris Jackson the Finch Greenhouse manager and his students, this last year over 6000 native plant plugs were produced for planting on University properties and distributed at no cost to environmental partners around the Kalamazoo community. This year a total of 10 local non-profit organizations and local school received native plant material for rain gardens, pollinator habitat or restoration work. This program not only enriches the natural community with plants for native habitat, but has taught many students the practical skills used in propagation and gardening.
During 2016 Natural Areas and Preserves Program partnered with schools and service groups facilitating over 5000 customer hours of education and service activities on WMU properties. Some of the highlights for 2016:

**Kazoo Grade School:** students grade 6-8 weekly activities throughout the school year in Kleinstuck Preserve.

**Saint Augustine Grade School:** 6th and 7th grade Service learning in Kleinstuck Preserve two times per year.

**WMU Office for Sustainability:** tours of Asylum Lake, Storm water, tree tour, sustainability tour.

**M-Tech Class:** Presettlement vegetation of Michigan, tour of Asylum Lake.

**WMU Finch Greenhouse:** Harvesting and propagating native plants for Landscape and Natural Areas projects.

**Natural Areas Program:** Presented to Garden Clubs, environmental groups and Students to inform them of the educational and research opportunities available on WMU properties.

**WMU Landscape Tours:** Campus tours are provided on request to staff, students, visitors and groups interested in learning about topics related to sustainability, horticulture, storm water, trees, perennials, annuals on the WMU campus and Natural Areas.

**WMU Classes and Research Utilizing Trees, Woodlots and Natural Areas on Campus:**

**BIOS 1620 Evolution and Ecology:** Uses Campus woodlots for succession labs.

**BIOS 2020, General Botany:** This class utilizes various campus plantings for laboratory exercises, including the trees at WMU’s Asylum Lake Preserve.

**BIOS 4270, Systematic Botany:** This class utilizes the entirety of main campus as well as Asylum Lake Preserve, to identify the major seed plant families as well as individual species using plant taxonomic keys.

**BIOS 3010, Ecology:** This class utilizes the tree and insect community on WMU preserves.

**BIOS 5260:** Uses various trees and shrubs for RNA extraction for biochemistry experiments.

**BIOS 5470:** Ornithology, uses campus natural areas.

**BIOS 5535:** Freshwater Ecology

**ENVS 1100:** Nature and Society, uses campus natural areas.

**ENVS 2260:** Field Environmental Ecology.

**ENVS 3000:** Intro to Sustainability.

**ENVS 3600:** Environment and Culture, uses Kleinstuck Preserve.

**ENVS 4010:** Service Learning Projects in Natural Areas.

**GEOG 2650, Introduction to Geospatial Technology:** This course teaches students the techniques involved in orienteering with different technologies. Trees are used as waypoints and markers.

**GEOS 5500:** WMU Geoscience: Geophysics field study.

**Geomatics:** Uses natural areas for surveying laboratory.

**WMU Department of Military Science,** Experiential Leadership Development.

**Current Research:**

- Dr. Sharon Gill, Erin Grabarczyk, WMU Biology: Effect of anthropogenic noise on the behavior of wrens.
- Dr. Todd Barkman, WMU Biology: Oak forest regeneration field study.
- Dr. Steve Kohler, WMU Environmental Studies: Asylum Lake water Quality field study.
- Tyler Bassett, MSU / ALPMC: Pre and post, prescribed burn vegetation analysis.
- Dr. Carla Koretsky, Dr. Kathryn Docherty “The influence of road deicers on the water chemistry of lakes in the Kalamazoo River watershed.”
Standard 5: WMU Educational Involvement & Service Learning Projects, Continued:

Outside While Learning (OWL): This is a program for 3rd graders from 4 different schools in the Kalamazoo County. Landscape Services partners with the Kalamazoo Nature Center to host educational events for the students at WMU’s Asylum Lake Preserves. The students are exposed to concepts of environmental stewardship, team building, and ecological restoration of prairie and forest habitats. This year’s OWL events were held in Kleinstuck (4/20) and Asylum Lake Preserve (5/12) and hosted a total of 200 children. 30 parents, teachers, and 24 volunteers.

Stewards of Kleinstuck: The Stewards of Kleinstuck are a group of neighbors and community members who facilitated over 3000 hours of volunteer labor at WMU’s Kleinstuck Preserve in 2016. Landscape Services has facilitated this group in their efforts to restore the ecology of the forest habitat, write a management plan, and host educational and service events throughout the year.

First Year Experience: Every year, the WMU students enrolled in a First Year Experience Seminar complete a service learning project with Landscape Services. Projects range from planting native vegetation, woodlot management, and invasive vegetation control. In addition to service projects, students in 2016 participated in 2 volunteer events to manage the Dwarf Hackberry (Celtis tenuifolia) savanna.

Maple Street Middle School: With the help of WMU professor Dr. Sarah Hill over 150 students, 15 parents, teachers, and 8 volunteers participated in a two-day event in Kleinstuck Preserve to “Notice, Wonder and Predict” on topics on preserve history, storm water, vegetation, and ecosystem services.

Saint Augustine Grade School: The entire 6th and 7th and 8th grade science classes worked for 5 hours in Kleinstuck Preserve (11/15) on volunteer service learning and educational projects. The event was so well received that two events are planned in 2017.
Natural Areas Volunteer Service Hour Summary

MAIN CAMPUS, (130+ acres of woodlots)
1600 customer hours of student, staff and visitors tours, educational programs and volunteer service events
Mentored 14 undergraduate/graduate students.
Assisted 7 faculty professors with field programs and classroom presentations.

PARKVIEW CAMPUS (100+ acres of Prairie and engineered wetland)
150 customer hours of educational programs, and tours for staff, students and visitors.

KLEINSTUCK PRESERVE (48 acres wooded wetland)
3000 customer volunteer/education hours

ASYLUM LAKE PRESERVE (274 acres Oak woodland, prairie, savanna and wetland)
1000 customer volunteer/education hours.

COMMUNITY OUTREACH (off campus)
400 customer volunteer/education hours.

Customers include religious communities, service groups, WMU alumni, environmental organizations,

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Nature Preserve
Please Help Us Protect Its Natural Features

...Respect the wildlife’s territory, do not approach too closely.
...Avoid birds during sensitive times: mating, nesting, and raising young.
...Limit audio playback near nesting areas
...Let Nature’s sounds prevail: avoid loud voices, and noises, including loud talking on cell phones.
...Do not damage the habitat: littering, breaking branches, trampling vegetation, and failing to pick up after pets.
...Stay on the trails to minimize impact.
**Affiliations and Continuing Education:** The Department of Landscape Services maintains several affiliations for its key personnel. The organizations include:

- International Society of Arboriculture
- Michigan Landscape and Nursery Association
- Arboriculture Society of Michigan
- Society of Municipal Arborists
- Michigan Turfgrass Foundation
- Kalamazoo Valley Landscape & Nursery Association
- Professional Grounds Management Society
- National Arbor Day Foundation
- Wildflower Association of Michigan
- Master Gardener Guild
- PLANET
- M-Tech Staff education program
- Osier Lifelong Learning
- Wildland Fire Training

Several staff members have degrees and backgrounds in the Green Industry. Degrees earned include Landscape and Nursery Management, Forestry, Environmental Resource Management, and Horticulture. The department supports employees in maintaining certifications and licenses by allowing them to participate in educational opportunities related to the work of the department. The Landscape Services staff contains the following certifications/licenses:

- 5 Certified Arborists
- 1 Horticulturalist
- 12 Master Gardeners
- 3 Certified Tree Risk Assessors (TRAQ)
- 34 Certified Pesticide Applicators
- 1 Certified Landscape Professional

In 2017 WMU Landscape Services is developing a staff educational program “Landscape University” that will cover many topics and skills needed by current and future landscape professionals.
Western Michigan University


“He who plants a tree plants a hope”

Lucy Larcom 1824-1893

“Plant A Tree”