Meeting Minutes
Town of Highland Tree Board
Thursday, August 21, 2025

The agenda for this meeting listed the Board Members, whether they are executive or legislative appointments and their terms of office as required by a new state statute.

Time and Place of Meeting: Chair Jim Colias called the monthly meeting of the Tree Board to order at 7:06 PM in the Town Hall main meeting room and was recorder for availability on town's Facebook page. Future meetings may be moved to Lincoln Center.

Roll Call
Present: Board Members Mary Ann Brunt, Chair Jim Colias, Vice Chair Ron Jackowski, Blane Roberts. Mary Ann Brunt took the minutes in absence of Secretary Mackey.

Absent: Board Members John (JT) Mackey, Arlene Sandrick, and Scott Polster. Town Council Liaison Alex Robertson, other invited personnel of the Town and other agencies.

General substance of matters proposed, discussed, or decided – record of all votes taken if there is a roll call.

- Mary Ann Brunt made a motion to approve the minutes of the meeting held June 19, 2025. Blane Roberts seconded the motion. Approved by unanimous consent of the members present.

Phil Graf gave a power point presentation of the tree inventory he completed in May; note that last tree inventory was taken in 2017. Inventory performed via a Lake Co. grant to update tree inventory plan to prune, remove and plant trees, inventory trees and determine their health. Inventory work began in November 2024 and was completed in April 2025. The presentation and the inventory report was shared with the Public Works Dept.

Some highlights from the presentation:

- Over 11,000 trees could be planted throughout the town as only 58% of the available tree spaces are currently planted.
- Highland needs greater tree diversity as the majority of the trees inventoried are silver maples.

Old Business

a. **Tree Inventory**: see notes on Phil Graf's presentation. A copy of Phil's presentation is attached to the meeting minutes.

b. **Little Calumet River South Watershed Seedling Project**: Update on the trees planted through the Little Calumet River South Watershed seedling project: most of the saplings planted are dead – dried out twigs remain. Board to question Richard Underkofler to determine details of the watering schedule and to see if watering efforts were performed. Need to discuss the next steps to take- i.e., restitution, replanting, etc.

c. **Duluth & Parish Street Sanitary District Tree Planting**: Phil Graf provided a tree evaluation and arborist report providing an assessment of the planting along Duluth Street following a infrastructure rebuild project. Derek Snyder, the Town's Arborist Engineer of NIES Engineering disagreed with some of the recommendations. Alex Roberston previously shared work may be in progress for replacing some, but not all of the deficient trees. Board members seek an update on the status of replacing trees and plans to update future contracts dealing with stump removal. Tree Board plans to ask Alex Robertson to present info to the Town Council on the Duluth & Parrish Streets sanitary district tree planting. Want to know status of deficient trees and Council's plans, if any, about these trees.

d. **Review Approved/Unapproved Tree Species**: Links to an updated IDNR Tree Selection Guide and Tree Species List were provided on the meeting agenda. Tabled until future meeting.

e. **Arbor Day Foundation Trees –** Rich Underkofler has ordered 10 eastern redbud trees for planting around November 2025. Tree Board members would like to further discuss where to plant and believe education is needed. Ask Alex to present tree inventory data to the Town Council.

f. **NIRPC Invasive Tree Replacement Program –** Tree Board members would like to learn more about the program including length of program and any costs.

g. DNR Big Tree Tour – Sept 6. - Phil Graf advertised a free DNR bus trip on Saturday, Sept. 6 leaving Hobart at 9:30 a.m. to view state champion Pin Oak tree and samples of best/biggest trees in NW Indiana. Trip would end at 1:30 p.m. Registration needed.

h. DNR Tree Stewards Workshops. Information shared on agenda.

i. 2025 Indiana Community and Urban Forestry Symposium. Information shared on agenda.

j. Highland Twilight Parade. Blane Roberts, Arleen Sandrick and Mary Ann Brunt represented Tree Board along with Highland Neighbors for Sustainability at the July 3rd Twilight Parade.

Discussion Topics

a. **2025 Tree Inventory Report Special Meeting – July 17:** The board members desire to invite Phil Graf, Lake County Commissioner Mike Repay, Town Council Liaison Alex Robertson, Public Works Director Mark Knesek, Assistant PW Director Kim Webb, Parks Director Trever Kinley and new Parks and Recreation Superintendent Tim Diamond to a special meeting in July to discuss the report, demonstrate tree data and how it functions on the Town's ArcGIS

account. Formulating a Risk Assessment Policy, budgets for the removal of dead and poor condition trees are proposed for discussion at this meeting.

b. **Action Plan:** The members updated the Board's 2025 Action Plan:
    1. Monthly idea sharing of ideas to keep the Board moving forward. **All Board Members.**
    2. Become a member of the Indiana Arborist Association and participate in the 2025 IAA Annual Conference. **Completed 1/21/25 by Jackowski and Roberts.**
    3. Town Council appointments to expiring Board Member Terms. **Completed 2/24/25.**
    4. Board Chair, Vice Chair and Secretary Appointments. **Completed 2/24/25.**
    5. Board member distribution of 20 CommuniTree Grant trees to homeowners at the Public Works Yard. **Completed 4/12/25**.
    6. Update the Approved /Unapproved Species List. **Completed by Jackowski 4/24/25, but consideration delayed for a more "user friendly" document by Scott Polster, Phil Graf, and Jackowski.**
    7. Organize an annual Arbor Day Event. **Completed 4/25/2025.**
    8. Participate in Park Pride Day. **Completed 4/26/25.**
    9. Secure utility clearance and transplant three Jackowski nursery trees to yards of Chuck Haber (8417 Cottage Grove Ave) and Bernie Zemen (2736 43rd St). **Completed 5/19/25.**
    10. Post a Tree of the Month and/or Tree Care Tips on the Board's Facebook Site and the Tree Board Page on the Town of Highland Website. **Assigned to Colias.** (Investigating tips from Morton Arboretum on caring for trees after storms. He reported that a lot of useful information in on Tree Board's Facebook page.)
    11. Secure 1 or 2 expert speakers per year for community educational sessions on pertinent topics. **Assigned to Colias**.(Planning for February 2026).
    12. Attend meetings of the Chamber of Commerce and NWI Urban Waters Partnership to maintain community relations and become aware of urban forestry grants. **Assigned to Sandrick.**
    13. Recruit new Board Members for terms ending in January 2026. **All Board Members.**
    14. Renew application for Tree City USA recognition before December 31. **Assigned to Secretary.**
    15. Identify 2025 accomplishments, key facts and publish in an Annual Report for a media release to the Town Council, Gazebo Express, NWI Times and WJOB. **Assigned to Secretary.**

New Business: Mary Ann Brunt and Arleen Sandrick will staff a table at Highland Neighbors for Sustainability's second annual bird migration festival at Highland Heron Rookery on Sept. 13 from 10 – noon to promote planting trees for the birds.

Adjournment: Blane Roberts made a motion to adjourn at 8:20 pm. Ron Jackowski seconded the motion. Approved by unanimous consent of the members present.

Respectfully submitted,
Mary Ann Brunt, Board Member

TOWN OF HIGHLAND, INDIANA

2025 Tree Inventory Report

June 9, 2025

Prepared By:

Leslie Delles, Urban Forestry Consultant
ISA Certified Municipal Arborist # IL 9199-AM TRAQ

Jon Carlson, Tree Risk Management Consultant
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GREAT LAKES URBAN FORESTRY

MEMBER ISA | CERTIFIED ARBORIST ISA | URBAN FOREST PROFESSIONAL ISA

Introduction

In February of 2025, Certified Arborists from Great Lakes Urban Forestry (GLUF) began collecting data for a comprehensive tree inventory of the Town of Highland. This tree inventory report is a statistical overview of the inventory data and will address some of our observations, potential mitigation measures and other recommendations. GLUF is pleased to provide its tree inventory and GIS mapping services along with this report and analysis of the tree population. The Town of Highland is now equipped to use this valuable information to address short-term concerns, long-term management considerations, and overall planning objectives.

Collection Parameters

The following is a detailed description of data that was collected for each tree.

TREE STATUS
For this inventory, the status field includes whether the site is home to an Active Tree, a Planting Space, or a Stump.

ADDRESS
The address was recorded as the numerical address at which a tree is located, based on the observed street address, or the listed street address of the GIS parcel data we have available to us.

STREET NAME
The street names conform to the names listed on street signage. The street name is for the address at which the parcel is listed, regardless of how the buildings on the lot are oriented (if on a corner lot).

RELATIVE LOCATION (SITE)
All trees are listed by zone, address, street name, on street name, and the following site prefixes, which determine where exactly on a property the tree is located. Sites are numbered with the flow of traffic.

F – Front of the property
R – On the right side of the property
L – On the left side of the property
B - In the back of the property
M - On a median in the center of a street
A – Across from an address

PARK NAME
Where appropriate, the name of the park, school or municipal property.

X and Y
These are the X and Y coordinates of the tree location recorded in the WGS 1984 Web Mercator Auxiliary Sphere coordinate system.

SPECIES
All tree species are listed using common and botanical names and were identified to the species level. Specific cultivars, hybrids, or varieties were not identified.

STEMS
This field indicates how many stems diverge below 4.5’ above the ground.

DBH
Trees were measured using DBH (Diameter at Breast Height, 4.5’ above ground level), a standard forestry measure of tree diameter, using a forester’s DBH tape. This method provides the most accurate reading of tree diameter, which can be highly variable depending on the dimension in which it is linearly measured.

CONDITION

Condition ratings are based on a normal standard distribution. We expect the greatest number of trees in the average category (3), fewer trees in the above average and below average categories (2 and 4, respectively), and the fewest number of trees in the specimen and very poor categories (1 and 5, respectively). Condition is a continuous variable, meaning that anywhere along the curve we supplied, you should be able to estimate the number of trees that are (e.g.) a 2.5 condition, even though condition was only recorded as whole number integers (see table below).

Condition 1	**Specimen** – Tree has no observable defects, wounds, diseases, and has textbook perfect form for the species. In addition, since young trees tend to be trouble free and homogenous, a Condition 1 tree must by definition be a minimum of 16" DBH. These are legacy trees, and as such are rare.
Condition 2	**Above Average** – Tree may have a small amount of deadwood, or a very limited number of minor defects. The overall form of the tree must be good and consistent for the species in question. These trees must be a minimum of 8" DBH. Often the difference between Condition 2 and 3 is form or growth habit.
Condition 3	**Average** – Tree has moderate but acceptable amounts of deadwood, wounds, or other defects, but is generally healthy. A wide variety of forms are acceptable for this group, which is meant to define the middle ground around which better or worse trees can be defined and identified.
Condition 4	**Below Average** – Tree has defects, deadwood, wounds, disease, etc. that have to the potential to cause a need for removal. Very poor form or architecture can put an otherwise healthy tree in this category as well, due to the potential for tree or root failure.
Condition 5	**Very Poor/ Dead** – Tree must be removed. Physical or health defects are too far gone for the tree to be reasonably saved. Like Condition 1 trees, these are relatively rare; trees that are getting to this level are removed before they reach this stage.

ARBORIST RECOMMENDATION

Maintenance recommendations are provided to assist in managing the tree population. These are general guidelines for pruning and care, and we find they are helpful for managing and prioritizing maintenance.

Prune- Cycle	Tree is in good health, and will require standard pruning or maintenance on a 3-5 year cycle
Prune- Train	Tree is within the 1-8 inch DBH range and requires structural pruning to establish good architecture
Prune- Priority	Tree has not been properly pruned during its developmental years, has suffered damage, is overgrown, has low risk deadwood, or for other reasons needs pruning sooner than a 3-5 year standard cycle
Prune- Dead Limb	Specific dead limb(s) not qualifying as moderate or severe deadwood by percentage
Remove- Standard	Tree should be removed, but does not pose an immediate elevated risk situation; should be removed within 1-3 years
Remove- Low Priority	Tree is recommended for removal as budget and time allows
Remove- Priority	Tree poses an elevated risk and should be removed in an expeditious manner
Risk Assessment- Standard	Level 2 - Standard Risk Assessment is recommended; an assessment without advanced tools or climbers
Risk Assessment- Advanced	Level 3 - Advanced Risk Assessment is recommended; an assessment using advanced tools, techniques and/or climbers
Monitor- Annual	Tree has a structural defect or other significant issue that requires yearly reassessment
Monitor- Long Term	Tree shows signs of developing issues or general decline and requires long term monitoring for further change or decline
Grind Stump	Stump is visible and should be removed
Maintenance-Other	Tree requires maintenance not related to pruning or removal. Typically used for situations such as leaning new tree, chemical treatment, mulching, girdling objects, etc.

RECOMMENDATION REASON

Reasons for the arborist recommendations above are listed here. This is a limited list but includes the most common observed issues that justify the condition and arborist recommendation for that tree.

Clearance		Branches are blocking/ touching building, sidewalk, street, or sign
Dead		Tree is dead or nearly so
Deadwood	Large Limb	One or more larger dead limbs requiring removal but not moderate or severe deadwood by percentage
	Moderate	Tree contains an estimated 11-30% deadwood
	Severe	Tree contains more than an estimated 30% deadwood
Decay Column		Tree has visible or audible decay in central trunk(s)
Defect	Other	Tree has other defect not listed; specifics noted in comments field
	Unobservable	Tree has a potential defect that is not observable from the ground
Dieback		Tree crown is dying back
Girdling Object		An object is girdling the tree or tree part
Hanger		Branches are hanging in crown, partially attached or free hanging
High Location Value		Justification for Risk Assessment; tree is in prominent location and has ecological value
Included Bark		Tree branches have tight V-shaped union(s) and have developed bark inclusions
Insects/Disease		Tree has observable signs or symptoms of pests or pathogens
Lean		Tree is leaning at undesirable angle
Mechanical Damage		Basal damage caused by landscaping equipment, or other physical damage
New Planting		Justification for establishment pruning, staking, mulching, etc.
Other		Other notable observance not listed; specifics noted in comments field
Overgrown		Excessive branch or sucker growth requiring priority pruning
Poor Form		Tree has poor architecture, often due to limited growspace or improper pruning
Roots	Compacted	Observed or inferred signs of soil compaction
	Girdling	Observed girdling roots or severe trunk flattening
	Heaving	Observed evidence of root or soil heaving
	Multiple Issues	Two or more root issues
	Still BB	Roots confined to ball & burlap due to intact twine and basket, treated burlap, or other observed factor
	Wounded	Root damage from construction, hardscape, mowing equipment, or other factor
Rot	Heartwood	Observable internal decay; decay column, cavity, etc.
	Basal	Observable decay at the base of the tree
	Sapwood	Observable vascular tissue decay
	Other	Other signs of decay such as wetwood, root rot, etc.
Mushroom/Conk		Visible fungal fruiting bodies
Topped		Tree had its apical meristem or terminal leader removed; typically due to poor pruning practice, utility pruning, or storm damage
Weak Trunk Union		Weak union caused by included bark or poor branching angles that have compromised structural stability
Wounds	Crown	Scaffold or secondary branch wounds affecting tree health and/or stability
	Trunk	Trunk wounds affecting tree health and/or stability
Utility Conflict		Pruning required due to interference with wires, street lamp, traffic light, or other utility
Sign Conflict		Pruning required due to obstruction of signage
Storm Damage		Tree has recent damage due to storm or winds such as torn limbs

LAND USE
For the purposes of this inventory, land use designations include Agricultural, Commercial, Industrial, Institutional, Multifamily, Recreational, Single Family, Transportation, and Other.

GROWING SPACE/PARKWAY SIZE
For street tree inventories, this field is used to record the distance from the curb to the sidewalk or such other soil volume conditions or restrictions.

1-3 FEET	Parkway width is 1-3 feet
4-6 FEET	Parkway width is 4-6 feet
7-12 FEET	Parkway width is 7-12 feet
13+ FEET	Parkway width is 13 feet or greater
TREE PIT	Tree is planted in a container or pit
NO SIDEWALK	No sidewalk is present
OPEN	Tree is growing in an open area, used primarily for trees in Park settings
OTHER	Any other category not described above

RISK LEVEL
This is the equivalent of a Level 1 Limited Visual Risk Assessment and denotes a condition observed by the Arborist that would appear, in their judgement at the time of the inventory, to pose possible risk to people or property. The specific condition would be reflected in the above Arborist Recommendations and Reasons.

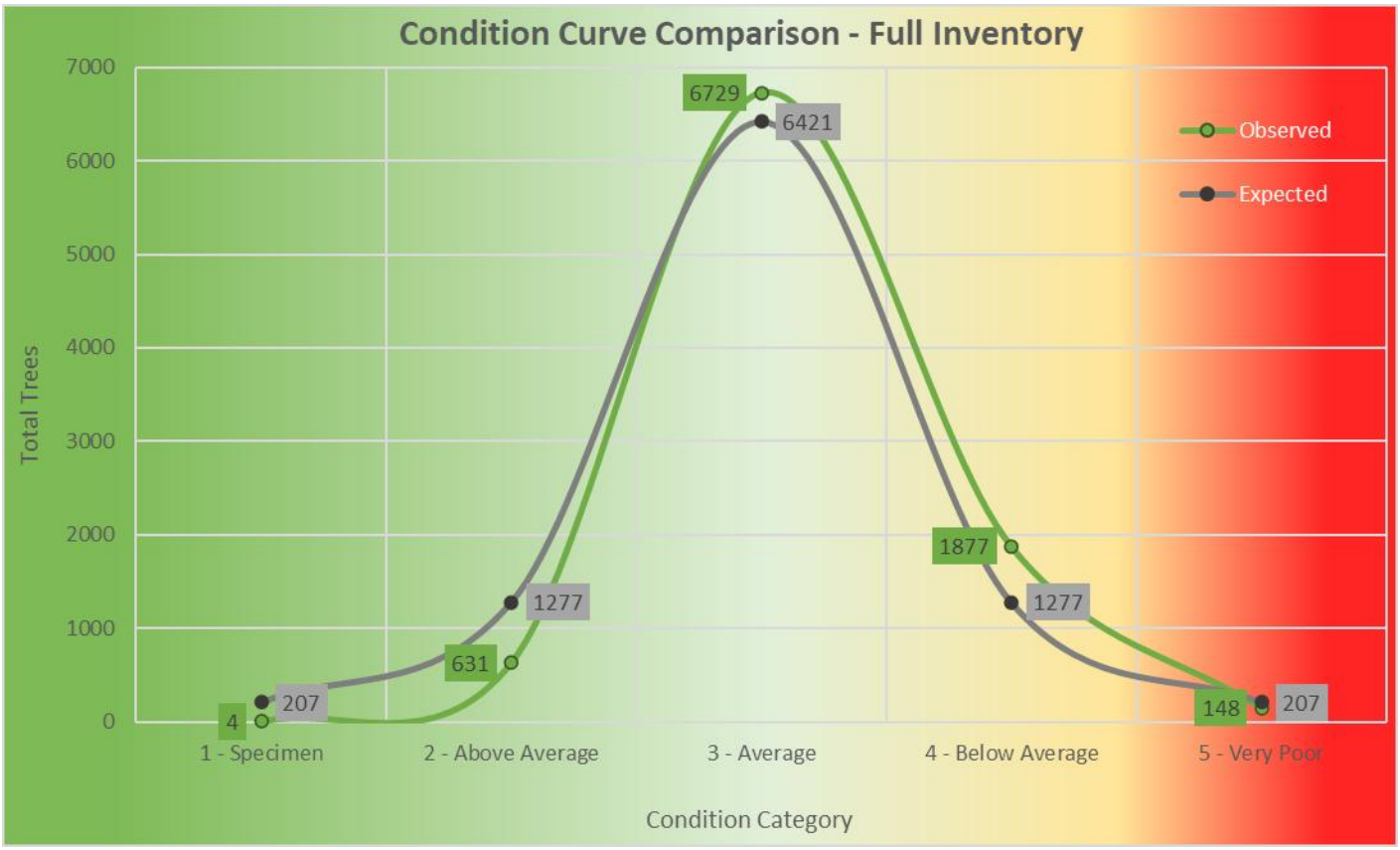
None Observed	No observable risk observed at the time of the inventory
Elevated	Moderate level of risk to people or property that should be investigated by the Owner/ Manager
Substantial	High level of risk to people or property that should be investigated by the Owner/Manager and mitigated as soon as practical
Critical	Extreme level of risk to people or property that should be mitigated by the Owner/ Manager as soon as possible

COMMENTS
Comments have been included as a courtesy to denote any conditions worthy of note. These comments will be standardized as much as possible, though certain situations certainly exist where nonstandard comments were utilized.

Statistical Overview

HIGHLAND TREE INVENTORY STATISTICS - FULL INVENTORY	2025	2017
Total Number of Trees Inventoried	**9,389**	**10,124**
Number of Street Trees Inventoried	6,686	7,614
Number of Park Trees Inventoried	873	1,073
Number of School Trees Inventoried	201	187
Number of Town Owned Property Trees Inventoried	513	193
Number of Waterway Trees Inventoried	1,116	1,057
Number of Stumps Inventoried	176	136
Number of Planting Spaces Inventoried	5,053	4,481
Total Number of Species	122	110
Total Diameter Inches	154,192"	167,615"
Average Tree Diameter	16.42"	16.51"
Average Tree Condition	3.16 (Below Average)	3.21 (Below Average)

The above table shows a decrease of 733 trees in the total population from 2017 to 2025. This is likely from the removal of poor and underperforming trees, as is shown by the improvement in the average tree condition rating from 3.21 to 3.16 during that time. The following analysis of charts and graphs is for the full tree inventory; Appendix B at the end of this report will discuss any significant differences seen between the total inventory data and the specific data for street trees, park trees, town property trees, school trees, and waterway trees.



This curve represents the distribution of trees in each of the categories enumerated above for the full inventory. As stated in the collection parameters section, deviations from the expected normal standard distribution can serve as a useful tool in analyzing the overall health of a tree population, and for this reason, we have included a theoretical curve representing a normal distribution so that comparisons can readily be made. The green line with green labels represents what we observed in the field, and the grey line with grey labels is the predicted normal distribution. The condition curve for the Highland inventory indicates a tree population that is in overall below average condition.

There were four Condition 1 specimen trees located during this data collection. We generally expect that the specimen trees (and Condition 5 trees as well) will come in lower than their statistical norm because of their rarity. A Condition 1 tree must be at least 16" DBH, have textbook perfect architecture for the species, and have no observable defects. Nearly 50% of the inventoried town trees have a DBH 16" or greater and meet the DBH minimum for the Condition 1 category, however their structure, vigor, and/or defects prevent them from receiving this condition rating. As younger trees are planted in sites with adequate growing space, and are properly pruned and maintained, they should develop with good structure and may mature to become Condition 2 and eventually Condition 1 trees.

The Condition 5 very poor trees are slightly lower than the expected norm which is common in urban settings as trees are often removed before reaching this state. It is recommended that any Condition 5 tree be prioritized and removed in a timely manner.

The Condition 2, or above average trees, are significantly lower than what statistical analysis would predict. Like the Condition 1 category, Condition 2 trees need to have good structure consistent with the species in question and be over 8" DBH. Almost 78% of the inventoried trees are 8" DBH or larger and qualify for the Condition 2 status, however structure or defects prevent them from earning an above average rating. Looking toward the future, the Town has an opportunity to further increase the number of trees in the Condition 2 category. In general, if site selection for the trees is well matched to the species, and trees are properly planted, mulched, watered, and established, and if they receive cyclical pruning and maintenance, trees will often mature with good form without significant defects. These trees can eventually become Condition 2 trees.

The Condition 4, or below average, trees came in approximately 50% higher than what would be statistically expected. This is an indication that there is a need to improve ongoing tree maintenance with cycle pruning and removal of declining trees. Using this tree inventory to locate trees in need of removal and maintenance, combined with proper maintenance of the tree population, the Town can decrease this number over the next few years.

The number of trees in the Condition 3 average category is slightly higher than the expected norm and this is simply because all trees less than 8" DBH are always assigned this category, unless they happen to be in worse condition. In the next few years, when below average and average trees receive maintenance and pruning, we would expect more trees to move into the average or above average categories.

The above age class analysis chart illustrates a somewhat typical trend in the overall age spread of a tree population seen in a municipal setting. We often see many trees young to middle aged and a relatively lower number of trees in the older age categories. For Highland, the young to middle-aged class trees in the above age class analysis chart (0"-12") make up nearly 40% of the overall tree population. This illustrates an emphasis over the last few years on tree planting. Over 19% of Highland's inventoried trees have a DBH of 6" or less. It is assumed that most trees grow on average ½" per year, so we consider these trees to be less than 15 years old, although that figure varies significantly depending on the species. The inventory shows 20% of the population has a DBH of 7-12", these mid-size trees are approximately 15-24 years old. There were 2,028 trees (22%) that were 13"-18", about 25-35 years old. The 1,684 trees (18%) in the 19-24" DBH category are generally mature trees over 35-45 years old.

The 2,001 trees in the 25"+ DBH categories are about 45-50+ years old and account for 21% of the inventoried tree population. Some of the mature in these categories are still in average to above average condition, however, some of these may be nearing the end of their natural life. Often the number of trees in the 30"+ categories are lower due to the natural senescence and ensuing decline of trees in urban settings.

A positive aspect shown in this chart is the commitment to new plantings within the last 25 years, as evidenced by the number of trees in the 1-12" range. A desirable population trait is to have a similar number of trees in each age classification. The Town of Highland has opportunities to bring more trees into the larger age classes as the right trees are being planted in the correct locations followed by regular maintenance over the life of the tree.

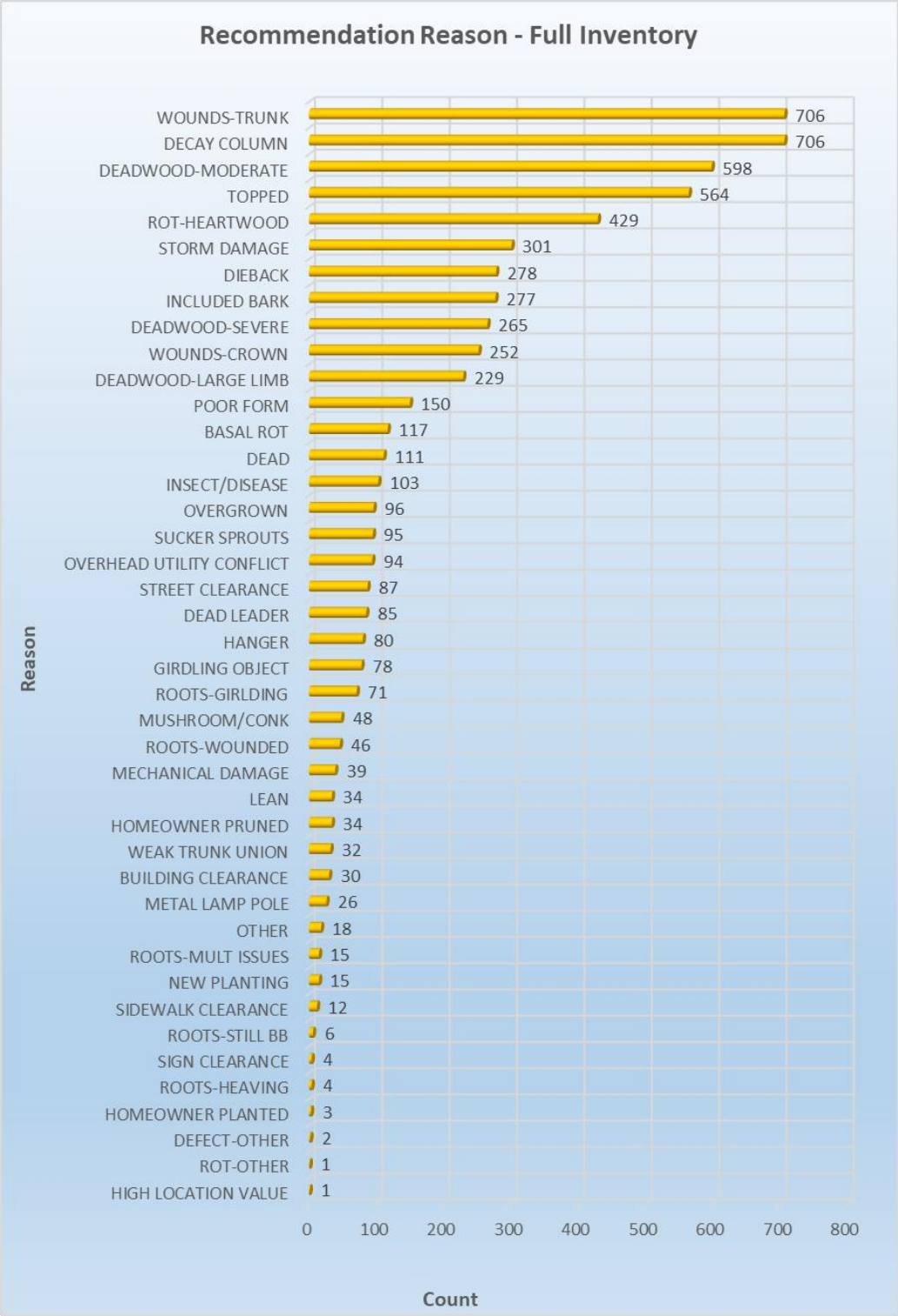
In terms of Arborist Recommendations of maintenance needs in the total tree population, the statistics displayed above show that most trees (77%) require only cyclical pruning on a regular basis; however, this means that 23% of the population needs some type of priority maintenance. Most of the priority maintenance is dealing with removals; 1,382 trees are recommended for removal which is 15% of the population. This is a high percentage, indicating the Town is behind in conducting removals. The 125 trees in the priority removal category should be prioritized over other removals. The 683 trees designated as standard removals should be prioritized and removed in a timely manner. The 574 trees in the low priority removal category should be removed as time and budgets allow. The remaining categories were used to indicate trees in need of maintenance which should be prioritized over those in the cyclical prune category and will be discussed briefly below.

The 232 trees in the two monitor categories are in a transitional phase. These trees have defects or signs of developing issues or general decline which should be reassessed periodically and their maintenance status updated.

The 470 trees in the Prune-Priority group are trees which are simply overgrown or have parts which need to be removed promptly and should have pruning prioritized over the trees in the cyclical prune set. We consider that this work should be done within 1-3 years.

The 85 trees categorized for training pruning are typically trees smaller than 8” DBH which have structural issues or are overgrown and require selective pruning to establish better architecture. Establishment pruning of young trees promotes proper branching habit and structure and is one of the least expensive, yet most effective maintenance items that can be performed on a young tree.

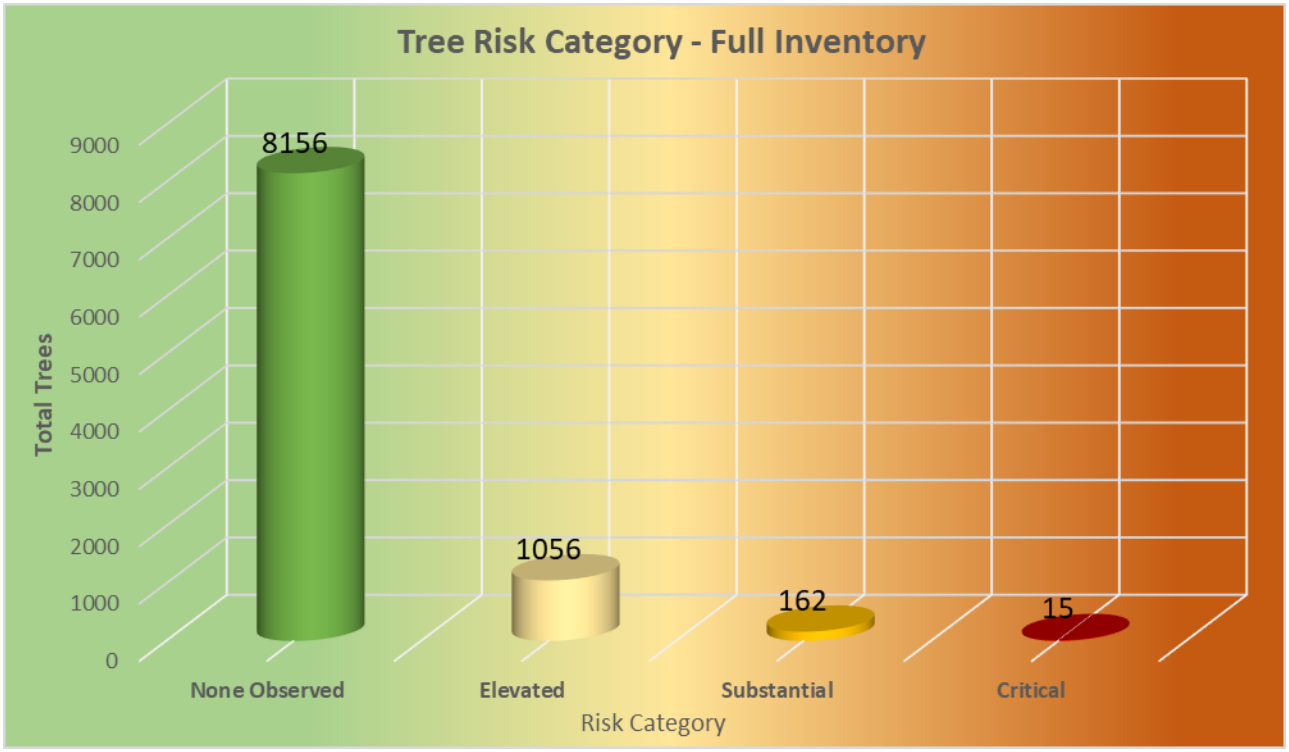
The six trees in the Other Maintenance category need some other form of maintenance not covered in the rest of the categories, for example the removal of girdling objects, anchor staking, or removal of volunteers. A description of the maintenance needed should be found in the comments field.



The arborist recommendation reasons chart above summarizes the field observations into the main factors that justify the arborist recommendation, the condition, and the risk rating of each tree. Some trees may have more than two factors, but the two most prominent issues that directly pertained to the maintenance recommendation or condition were noted. The Town of Highland can use this inventory data to query specific defects and prioritize mitigation actions. This chart illustrates an interesting overview of the health, defects, and maintenance needs of the Town's tree population.

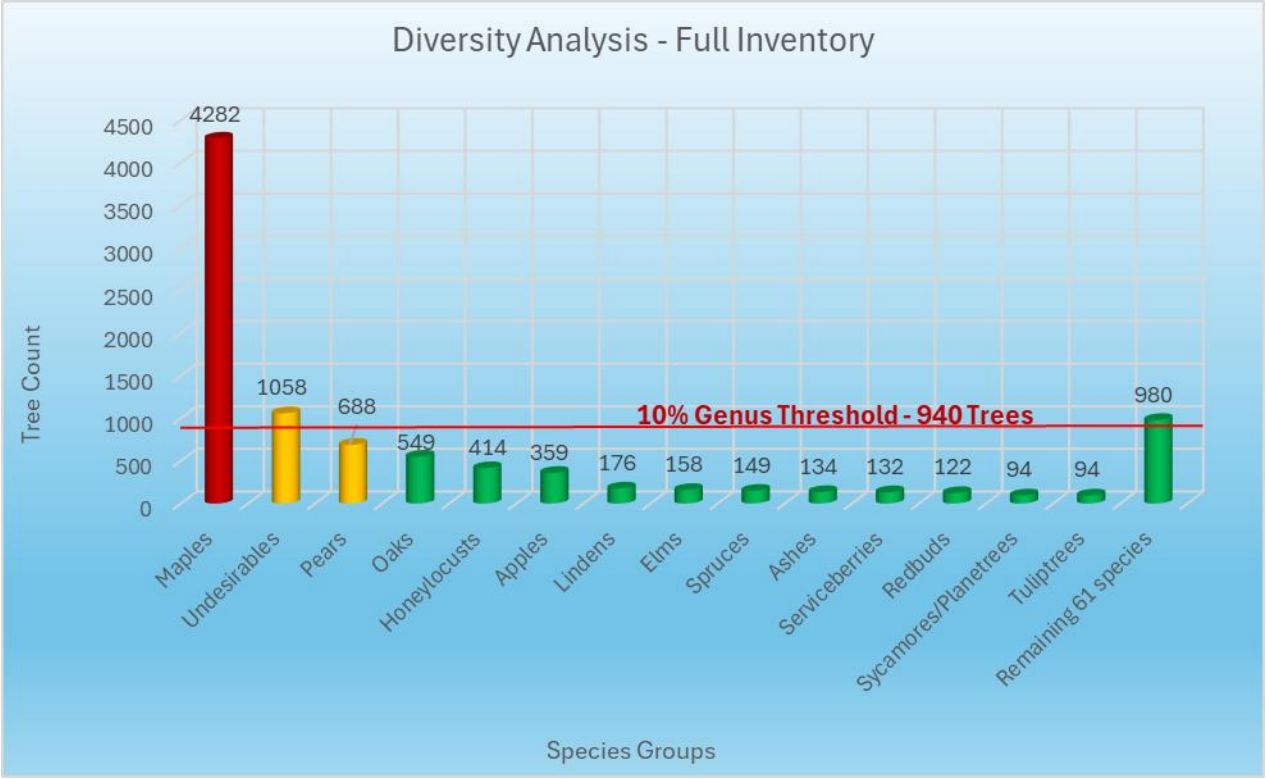
Risk Level Summary

We cannot stress enough that these were rapid assessments, and not full risk assessments, and as such, are meant to indicate a need for further study, and do not represent a legal description of these trees' risk levels. These assessments are not legally binding and are not intended to be utilized as evidence in a court of law. They serve primarily for internal record keeping, and a means of locating trees which require more detailed study before making a final decision as to management strategy. Since the risk level field is part of the data collection parameters for the Town of Highland inventory, it is recommended that the Town develop and implement a tree risk assessment policy so that consistency and accountability are successfully achieved.



As illustrated in the chart above, the majority of the inventoried town trees were found to have no observable risk level. However, 1,233 trees were found to have some degree of risk, about 13% of the population. There were 15 trees that fell into the Critical risk category and these should receive immediate mitigation actions. Trees in the Substantial Risk level category should receive a Level 2 or 3 Risk Assessment and/or mitigating action. Any tree found at an elevated risk level should be monitored and/or inspected by Highland staff and a threshold of risk tolerance be established. Some elevated risk level trees may also be considered for a Level 2 Risk Assessment and/or mitigating action. Great Lakes Urban Forestry would be pleased to assist the Town in any aspect of developing or managing a tree risk assessment policy or performing Level 2 Basic Risk Assessments or Level 3 Advanced Risk Assessments.

Diversity Statistics



The "20-10-5" rule has been adopted as a Best Management Practice in urban forestry. This rule simply states that a tree population should ideally have no more than 20% of any single family, no more than 10% of any single genus, and no more than 5% or any single species. As we have learned from the EAB infestation and Dutch Elm Disease, when a pest or pathogen that attacks specific tree genera is introduced into a region where those genera are overrepresented, tree populations can take a devastating hit. We have included a 10% genus threshold line on the diversity analysis graph above which illustrates the composition of the inventoried tree population.

It is quite common for the Maple genus to be most numerous in urban settings because they are an adaptable and hardy shade tree. However, at nearly 50% of the population, Maples are extremely overrepresented in the Highland population; Silver Maples alone account for 26% of the entire population. It is highly recommended that the planting of Maple species be limited and the current number of Maples be reduced by starting to remove poor condition and over-mature trees.

The 194 trees in the Undesirables category are species such as Mulberry, Boxelder, Cottonwood, Willow, Black Cherry, Black Locust, Siberian Elm, Buckthorn, White Poplar, and Ailanthus. These trees are notorious for being fast growing, weak-wooded and/or invasive, weedy trees that often develop a variety of structural defects as they mature. For safety, aesthetic, and ecological reasons, it is recommended that Highland set a goal of gradually reducing the number of undesirable trees in the inventory and replanting them with a diverse set of tree species, increasing overall diversity and tree population stability.

Proper planning will help Highland protect the investment in each new tree and create a tree population that is resilient and diverse. A positive element in the population is that there are 122 different species represented in the population. (see list in Appendix A). This is an above average number of species for a municipal tree population. The Town of Highland should have a targeted approach when it comes to choosing species to plant, focusing on planting a wide variety of tree species and genera. The table below, which lists species that each account for less than 1% of the total tree population, can be used as a guide when choosing future species to plant. This list is limited and does not represent the other options available for planting in this region that are not currently present in the population.

WALNUT-BLACK	86		HOPHORNBEAM-IRONWOOD	13		BIRCH-GRAY	2
HACKBERRY-COMMON	80		BLACKGUM	12		DAWN REDWOOD	2
HAWTHORN-SPP	72		MAGNOLIA-SWEETBAY	12		DOGWOOD-PAGODA	2
LILAC-JAPANESE TREE	59		BIRCH-WHITE	9		FIR-CONCOLOR	2
CHERRY-SPP	58		HICKORY-SPP	8		MAGNOLIA-CUCUMBER	2
BALDCYPRESS	54		MAGNOLIA-SAUCER	8		PEACH	2
SWEETGUM	47		VIBURNUM-SPP	8		PERSIMMON-COMMON	2
BIRCH-RIVER	46		YELLOWWOOD	8		PLUM-AMERICAN	2
MAGNOLIA-SPP	41		PLUM-SPP	7		WILLOW-PUSSY	2
PINE-WHITE	37		SMOKETREE	7		BEECH-EUROPEAN	1
DOGWOOD-SPP	36		DOGWOOD-FLOWERING	6		BIRCH-SPP	1
GINKGO	31		EASTERN REDCEDAR	6		DOGWOOD-KOUSA	1
PINE-AUSTRIAN	28		YEW	5		HYDRANGEA-TREE	1
ARBOR VITAE	27		DOGWOOD-CORNELIAN	4		KATSURA	1
HORNBEAM-AMERICAN	24		PINE-SCOTCH	4		LARCH-EASTERN (TAMARACK)	1
BUCKEYE-OHIO	22		SASSAFRAS	4		LILAC-SPP	1
KENTUCKY COFFEETREE	22		DOUGLAS FIR	3		PINE-LOBLOLLY	1
CATALPA-NORTHERN	18		HICKORY-PECAN	3		PINE-MUGO	1
HORSECHESTNUT	14		PRINCESS TREE	3		ROSE OF SHARON	1
JUNIPER-COMMON	14		UNKNOWN	3		SILVERBELL-CAROLINA	1
			ASPEN-QUAKING	2			

Conclusion

It has been a pleasure for Great Lakes Urban Forestry to provide this tree inventory, data analysis, and report for Town of Highland. We look forward to the opportunity to partner with staff to assist in urban forestry management planning, performing tree risk assessments, or assisting in any other tree or natural resource related initiatives. Thank you for the opportunity to partner with you, and we look forward to continuing to serve as your tree, natural resource, and geospatial data experts.

GREAT LAKES URBAN FORESTRY

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Appendix A: All Tree Species List

The table below is an itemized list of all tree species present in Highland's tree population, along with average DBH, and average condition for each species. The average condition ratings can be used as a guide as to what species are growing well in town.

SPECIES	COUNT	% OF TOTAL	AVG DBH	AVG COND
MAPLE-SILVER	2434	25.92%	24.66	3.38
MAPLE-RED	835	8.89%	12.63	3.05
PEAR-CALLERY	680	7.24%	11.33	3.09
MAPLE-NORWAY	634	6.75%	13.90	3.00
HONEYLOCUST	414	4.41%	19.73	3.24
APPLE-CRAB SPP	338	3.60%	8.84	3.07
MULBERRY-SPP	263	2.80%	17.17	3.24
ELM-SIBERIAN	250	2.66%	22.99	3.40
COTTONWOOD-EASTERN	224	2.39%	32.14	3.25
OAK-NORTHERN RED	182	1.94%	15.99	3.03
MAPLE-SUGAR	168	1.79%	12.04	2.98
MAPLE-FREEMAN	163	1.74%	10.55	2.83
BOXELDER	140	1.49%	17.30	3.54
LINDEN-LITTLELEAF	134	1.43%	15.80	3.04
SERVICEBERRY-SPP	132	1.41%	6.16	3.15
REDBUD-EASTERN	122	1.30%	7.88	3.07
TULIPTREE	94	1.00%	11.12	3.02
ELM-AMERICAN	90	0.96%	17.99	3.01
OAK-PIN	88	0.94%	16.86	2.91
ASH-WHITE	86	0.92%	16.26	3.31
WALNUT-BLACK	86	0.92%	14.44	2.88
OAK-SWAMP WHITE	84	0.89%	7.60	2.60
HACKBERRY-COMMON	80	0.85%	6.50	3.01
HAWTHORN-SPP	72	0.77%	7.01	2.97
SYCAMORE	68	0.72%	24.31	2.82
SPRUCE-COLORADO	67	0.71%	11.64	3.12
ELM-HYBRID	64	0.68%	4.69	2.91
OAK-CHINQUAPIN	64	0.68%	2.86	3.00
AILANTHUS	61	0.65%	16.05	3.23
LILAC-JAPANESE TREE	59	0.63%	5.29	2.98
CHERRY-SPP	58	0.62%	6.74	3.10
BALDCYPRESS	54	0.58%	9.52	3.02
ASH-GREEN	47	0.50%	18.15	3.49
SWEETGUM	47	0.50%	15.57	3.06
BIRCH-RIVER	46	0.49%	11.43	2.93
LINDEN-AMERICAN	41	0.44%	16.54	3.05
MAGNOLIA-SPP	41	0.44%	7.27	3.07
OAK-WHITE	40	0.43%	18.15	3.00
PINE-WHITE	37	0.39%	10.14	3.38
DOGWOOD-SPP	36	0.38%	4.42	3.00
OAK-BURR	33	0.35%	11.18	2.55

WILLOW-BLACK	33	0.35%	22.39	3.24
SPRUCE-NORWAY	32	0.34%	13.19	2.94
CHERRY-BLACK	31	0.33%	17.61	3.26
GINKGO	31	0.33%	9.58	2.97
PINE-AUSTRIAN	28	0.30%	17.64	3.07
ARBOR VITAE	27	0.29%	9.41	3.04
LONDON PLANETREE	26	0.28%	10.85	2.96
OAK-SHINGLE	25	0.27%	7.12	2.80
HORNBEAM-AMERICAN	24	0.26%	5.63	3.13
SPRUCE-WHITE	24	0.26%	6.29	3.38
BUCKEYE-OHIO	22	0.23%	4.05	2.95
KENTUCKY COFFEETREE	22	0.23%	4.32	3.05
APPLE-EDIBLE	21	0.22%	6.95	3.29
MAPLE-AMUR	21	0.22%	10.38	3.52
OAK-SPP	21	0.22%	2.57	3.05
SPRUCE-SERBIAN	20	0.21%	4.00	3.20
BLACK LOCUST	18	0.19%	15.56	3.00
CATALPA-NORTHERN	18	0.19%	12.56	2.89
WILLOW-SPP	17	0.18%	21.47	3.59
HORSECHESTNUT	14	0.15%	9.50	3.14
JUNIPER-COMMON	14	0.15%	6.93	2.93
MAPLE-JAPANESE	14	0.15%	5.29	2.86
HOPHORNBEAM-IRONWOOD	13	0.14%	5.15	3.15
BLACKGUM	12	0.13%	4.75	3.00
MAGNOLIA-SWEETBAY	12	0.13%	1.75	3.00
BIRCH-WHITE	9	0.10%	10.22	3.00
HICKORY-SPP	8	0.09%	2.88	3.00
MAGNOLIA-SAUCER	8	0.09%	12.25	2.88
PEAR-EDIBLE	8	0.09%	3.13	3.00
VIBURNUM-SPP	8	0.09%	8.75	3.25
YELLOWWOOD	8	0.09%	2.88	3.13
MAPLE-PAPERBARK	7	0.07%	5.14	3.00
OAK-HERITAGE	7	0.07%	1.14	3.00
PLUM-SPP	7	0.07%	11.57	3.14
SMOKETREE	7	0.07%	8.71	3.14
DOGWOOD-FLOWERING	6	0.06%	6.50	2.83
EASTERN REDCEDAR	6	0.06%	6.83	3.17
SPRUCE-SPP	6	0.06%	3.50	3.17
WILLOW-WEEPING	6	0.06%	30.67	3.83
YEW	5	0.05%	14.40	3.00
DOGWOOD-CORNELIAN	4	0.04%	2.50	3.00
HONEYSUCKLE-SPP	4	0.04%	2.50	3.00
MAPLE-HEDGE	4	0.04%	7.50	3.50
OAK-ENGLISH	4	0.04%	6.25	2.75
PINE-SCOTCH	4	0.04%	23.00	2.50
POPLAR-WHITE	4	0.04%	21.50	4.00
SASSAFRAS	4	0.04%	11.50	3.25

BUCKTHORN	3	0.03%	8.67	3.33
DOUGLAS FIR	3	0.03%	13.00	3.00
ELM-SPP	3	0.03%	2.67	3.00
HICKORY-PECAN	3	0.03%	3.33	3.00
PRINCESS TREE	3	0.03%	10.33	3.33
RUSSIAN OLIVE	3	0.03%	20.00	3.33
UNKNOWN	3	0.03%	2.67	3.67
ASPEN-QUAKING	2	0.02%	5.00	3.00
BIRCH-GRAY	2	0.02%	16.50	3.00
DAWN REDWOOD	2	0.02%	9.50	3.00
DOGWOOD-PAGODA	2	0.02%	6.00	3.00
FIR-CONCOLOR	2	0.02%	17.50	2.50
MAGNOLIA-CUCUMBER	2	0.02%	2.00	3.00
MAPLE-SPP	2	0.02%	14.00	3.50
PEACH	2	0.02%	2.50	3.00
PERSIMMON-COMMON	2	0.02%	13.00	2.50
PLUM-AMERICAN	2	0.02%	8.50	2.50
WILLOW-PUSSY	2	0.02%	26.00	3.00
ASH-BLACK	1	0.01%	21.00	4.00
BEECH-EUROPEAN	1	0.01%	5.00	3.00
BIRCH-SPP	1	0.01%	2.00	3.00
DOGWOOD-KOUSA	1	0.01%	2.00	3.00
ELM-CHINESE	1	0.01%	31.00	1.00
HYDRANGEA-TREE	1	0.01%	3.00	3.00
KATSURA	1	0.01%	11.00	3.00
LARCH-EASTERN (TAMARACK)	1	0.01%	2.00	3.00
LILAC-SPP	1	0.01%	3.00	3.00
LINDEN-SPP	1	0.01%	2.00	3.00
OAK-SHUMARD	1	0.01%	3.00	3.00
PINE-LOBLOLLY	1	0.01%	10.00	2.00
PINE-MUGO	1	0.01%	14.00	3.00
POPLAR-SPP	1	0.01%	29.00	3.00
ROSE OF SHARON	1	0.01%	2.00	3.00
SILVERBELL-CAROLINA	1	0.01%	5.00	3.00

Appendix B: Highlights of Specific Area Data

Street Trees

HIGHLAND TREE INVENTORY STATISTICS - STREET TREES	
Total Number of Street Trees Inventoried	**6,686**
Number of Open Planting Spaces Inventoried	5,053
Total Number of Species	106
Total Diameter Inches	113,117"
Average Tree Diameter	16.92"
Average Tree Condition	3.18 (Below Average)

- Street trees account for 71% of the total Town of Highland tree inventory.
- The 5,053 planting spaces in the total inventory are all in street ROWs. This, combined with the street tree inventory of 6,686 trees, gives a total of 11,739 existing and potential street trees. With only 57% of these spaces being utilized, the Town of Highland has an opportunity to greatly expand the size of its urban forest.
- The average overall tree condition rating is essentially identical to the total population. The tree condition curve and age class diversity graphs follow the total population graphs for these statistics.
- Street tree removals account for 77% of the total recommended tree removals.
- There were 100 priority removals recommended and thirteen of the fifteen critical risk trees in the overall inventory were street trees. Since street trees are generally in more heavily used areas, trees with defects could pose more potential risk to people and property. These removals should be prioritized accordingly.

School Trees

HIGHLAND TREE INVENTORY STATISTICS - SCHOOL TREES	
Total Number of School Trees Inventoried	**201**
Total Number of Species	39
Total Diameter Inches	2,569"
Average Tree Diameter	12.78"
Average Tree Condition	3.25 (Below Average)

- Trees at seven school properties account for only 2% of the total inventory and roughly one-third of them are 6” or under in size.
- School sites can be difficult to find planting spaces due to the high-use areas needed for sports and other activities. However, Highland could likely find ways to increase the number of trees on these properties.
- There were ten priority removals recommended at the schools, several of which posed an elevated risk; these should be prioritized and removed.

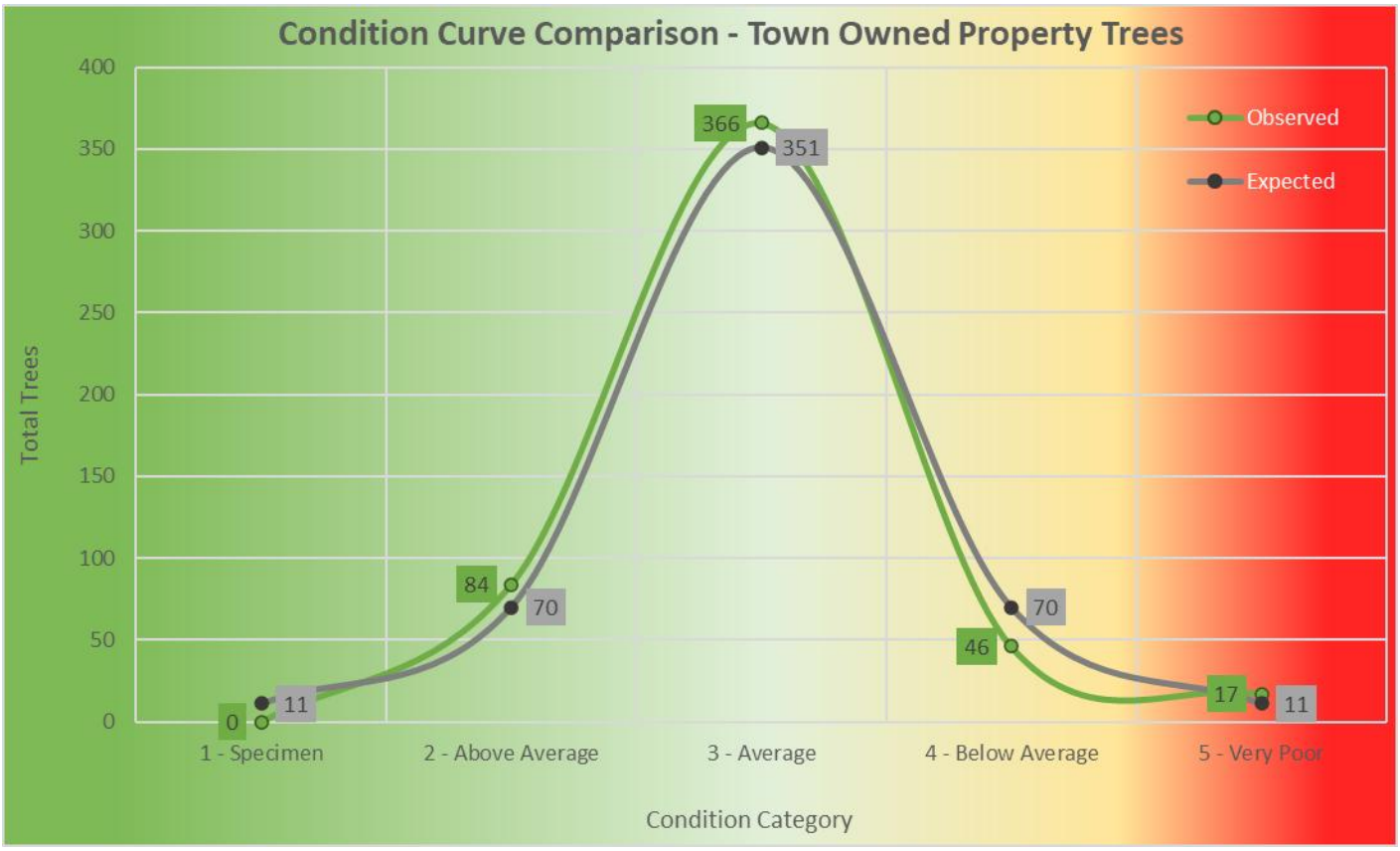
Park Trees

HIGHLAND TREE INVENTORY STATISTICS - PARK TREES	
Total Number of Park Trees Inventoried	**873**
Total Number of Species	68
Total Diameter Inches	11,760"
Average Tree Diameter	13.47"
Average Tree Condition	3.11 (Below Average)

- The 873 park trees inventoried make up 9.3% of the total inventory.
- Park trees tend to be smaller and younger; 59% are 12” and under as compared with 40% for the total inventory.
- The park tree average condition is slightly higher than the average for the entire population.
- There are 30 recommended standard removals and six priority removals, one of which was a critical risk 32” DBH Honeylocust in poor condition at Homestead Park that should be removed as soon as possible.

Town Owned Property Trees

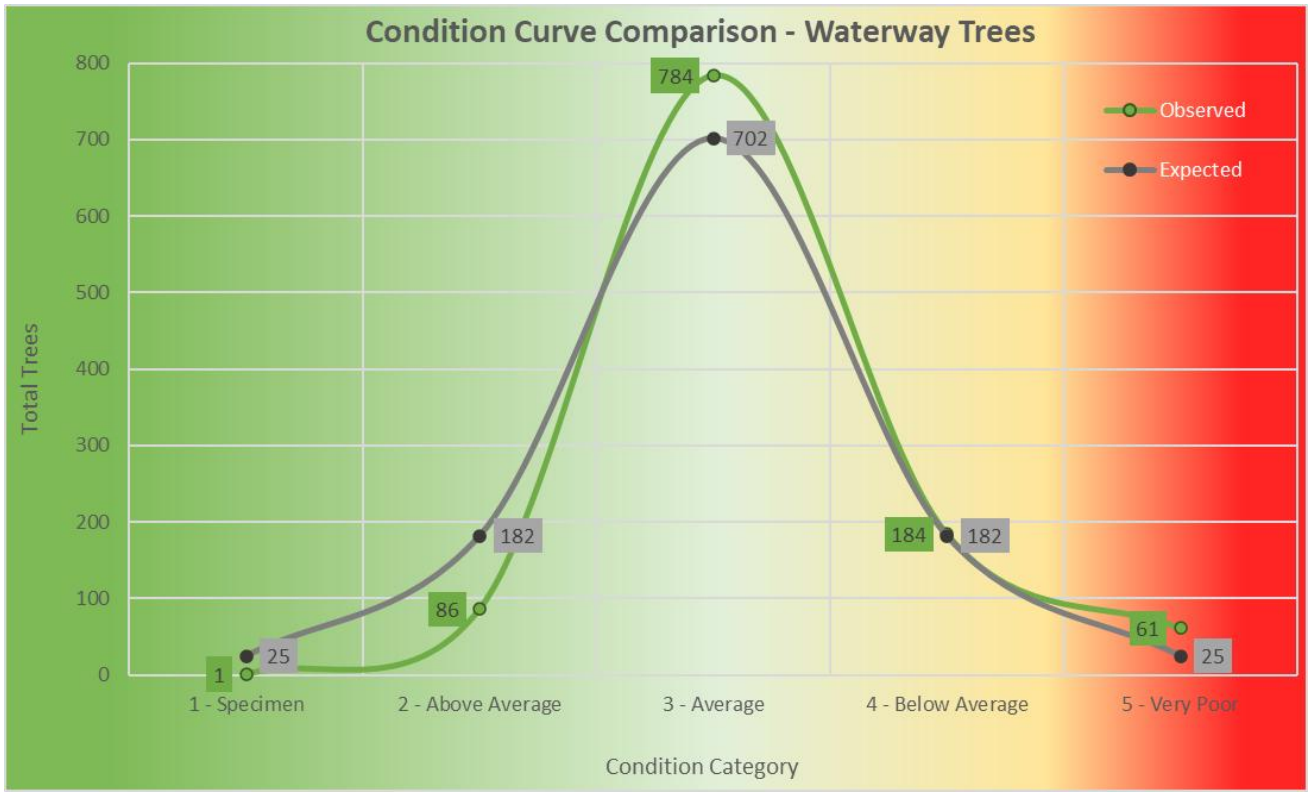
HIGHLAND TREE INVENTORY STATISTICS - TOWN OWNED PROPERTY TREES	
Total Number of Town Owned Property Trees Inventoried	**513**
Total Number of Species	57
Total Diameter Inches	4,625"
Average Tree Diameter	9.02"
Average Tree Condition	2.99 (Average)



- The 513 Town Property trees found at 13 locations make up 5.5% of the total inventory.
- Only 76 of the 513 Town property trees are over 12” DBH, indicating this population consists almost entirely of younger trees from more recent plantings.
- Even though more than half of the population is under the minimum size to be considered for the above average condition category (8” DBH, see page 3 of the report), the number of above average trees is significantly higher than expected. This indicates that these town property trees are likely receiving regular pruning and maintenance.
- There were 20 standard removals and four priority removals, one of which was a critical risk 28” DBH Red Oak on Highway Ave. that should be removed as soon as possible.

Waterway Trees

HIGHLAND TREE INVENTORY STATISTICS - WATERWAY TREES	
Total Number of Waterway Trees Inventoried	**1,116**
Total Number of Species	39
Total Diameter Inches	22,121"
Average Tree Diameter	19.82"
Average Tree Condition	3.20 (Below Average)



- Waterway trees were those trees located in low maintenance Town-owned parcels adjacent to three water channels.
- Waterway property trees made up 12% of the entire inventory. The average condition of these trees was lower than in the overall population with few above average trees and substantially more poor condition trees than would be expected.
- The 211 trees recommended for removal should be prioritized and removed as the schedule and budget allow.