Revised: July 15, 2022

Steve Bennett, AICP
Planning Director
City of Lake Forest Park
17425 Ballinger Way NE
Lake Forest Park, WA 98155

Re: Proposal for 2022 Tree Inventory

The Watershed Company Reference Number: 220424

Dear Steve:

We are pleased to help with the City of Lake Forest Park's update to the City-wide tree inventory for 2022. Our scope of work is detailed below, which includes a description of each task, a list of deliverables per task, and proposal assumptions. We have included a project budget and schedule of hourly rates for Watershed staff.

Scope of Work:

Task 1. Project Administration and Coordination

A. Project kickoff.

The Watershed team will meet with City staff and stakeholders to review the scope of work, timeline and project deliverables. Watershed will follow up with a work plan which will include a project schedule for completing inventory work and deliverables. The kick-off meeting may be conducted via video conference or in person, depending on scheduling needs and project team preferences.

B. Project administration, coordination, and meetings with City staff.

The Watershed Project Manager will work directly with the City Project Manager to set agendas and schedule meetings, coordinate the work plan, and provide status updates on project deliverables. Ongoing project coordination will be managed by the Watershed Project Manager, including tracking progress of any outside staff or volunteers. Ongoing meetings may be conducted via video conference. Watershed

can draft minutes for each project team meeting and distribute to project team members. To assist with project team communication and collaboration, Watershed recommends using a SharePoint drive or similar shared file system for documents and project calendars. This can be discussed during the project kick-off.

C. Establish methodology and data collection.

Watershed will work with the project team to establish a methodology and protocol for data collection. Methodology will be based on the 2010 tree inventory for Lake Forest Park, following the Urban Forest Effects (UFORE) Methods[1]. Plot re-measurement protocols will be established to address plot center relocation accuracy, inaccessible sites, borderline trees, plot size, visual estimates, and other information. This effort can begin in the project kickoff meeting and will be finalized in a protocol to be included in the work plan.

D. Finalize work plan and set up data collection.

A finalized work plan will be adopted by the project team which will include a data collection protocol, schedule, and deliverables. Watershed staff will set up data collection sheets along with a digital geospatial inventory, hosted online.

Task 1. Deliverables Summary and Assumptions:

- A work plan will be adopted following the project kick-off meeting and will include a project schedule, a data collection protocol, and key deliverables.
- An initial methodology will be agreed upon by the project team. A final version will be included in a final project report.
- A shared digital drive, such as SharePoint, will be established for the project team.

Task 2. Plot Inventory and Analysis

A. Conduct baseline field measurements.

Baseline field measurements will be based on the established methodology, collecting at least the same information as collected in the 2010 tree inventory. This baseline data includes plot-level and tree data outlined in the UFORE Methods including species, number of stems, diameter at breast height (DBH), height, height to live crown base, average crown width, distance to buildings, and other attributes.

[1] https://www.itreetools.org/documents/53/UFORE%20Methods.pdf

Relocating all plots and respective plot centers from the 2010 inventory may not be feasible based on previous data, landowner access, and site conditions. Watershed staff will work with the City during protocol and work plan development to ensure plot data collected during this effort will produce a robust statistical analysis for comparison of trends over time.

The Watershed Project Manager will organize and lead Watershed staff to conduct field measurements, coordinate field schedules and ensure data collection consistency. All field measurements will be targeted for completion during the leaf-on season (no later than the end of October 2022) for the most accurate species identification, canopy cover estimates, and ground cover estimates. Plot center locations will be relocated and mapped to accuracy standards agreed upon in the initial kickoff meeting and data collection protocol.

B. Compile and organize collected data.

All data will be collected in a digital spreadsheet, such as Excel, set up based on the established protocol when possible. Paper copies will be available as a backup. All data will be backed up daily and compiled weekly for quality control. The Watershed Project Manager will coordinate with any staff or volunteers collecting field data to ensure consistency and completeness.

C. Data input and analysis.

Upon completion of plot level measurements, data will be compiled for analysis. For this effort, we propose using a combination of i-Tree suite of software tools and internal statistical analysis (using Excel and R packages). Summary reports generated from i-Tree will be used in comparing current plot level data with past summary statistics such as number of trees, carbon storage and sequestration, pollution removal, building energy savings, and avoided carbon emissions.

Using collected plot and tree data, we will analyze descriptive statistics to summarize changes and trends in basal area, volume, density, and species composition. We recognize the importance of mature and exceptional trees which constitute an important resource for the community of Lake Forest Park. Therefore, trends and changes in the status of landmark trees (greater than 24 inches in diameter) and exceptional trees will be highlighted from the analysis.

Task 2. Deliverables and Assumptions

- This task assumes the City is responsible for contacting landowners and obtaining permission for access to property.
- Plot level data will be available in a digital spreadsheet, shared with the project team.
- Results and analysis from i-Tree and other software will be compiled within a final summary report.
- Plot center locations will be taken using ESRI's Field Maps app on a tablet connected to a GPS unit. All plot level data can be geospatially referenced based on plot center locations, and can be provided in a geodatabase, or similar product.
- Watershed staff may use one or more teams in the field concurrently depending on access and logistical coordination to ensure data is collected by agreed upon deadlines.

Task 3. Canopy Analysis Integration

A. Integrate plot level data with existing canopy analysis.

The Watershed team will integrate statistical summary data from plot level analyses with available tree canopy data from the City, i-Tree Landscape, and other sources. This will provide a more robust picture of trends and changes to the entire urban forest across the City, including spatial composition and forest types. Urban forest cover data will be overlaid with transportation, census data, and other geographic intersections as determined in the kick-off meeting.

B. Overlay plots with remote sensing data for structural analysis.

With 2021 lidar data recently released for King County, there is a great opportunity to use plot level measurements for a comprehensive structural analysis of the urban forest. Using the geospatially located plot data integrated with lidar and other remote sensing data, we propose a modeling approach to infer statistics across the City including basal area, canopy cover and density, height quantiles, structural complexity, and forest gaps. This analysis will create a more accurate and diverse picture of existing forest structural conditions. Summarized results would be provided in a final report with implications for urban forest management planning.

Task 3. Deliverables and Assumptions

- Any geospatial data will be shared with the project team in a geodatabase or similar product.

- This assumes the integration of existing canopy analyses and does not include additional processing of remote sensing inputs for classification (e.g., lidar data, satellite or aerial imagery).
- All remote sensing data used will be from publicly available and open access sources and does not include the purchase of private vendor data.

Task 4. Comprehensive Report of Findings

A. Compile findings and analyses into a comprehensive report.

Watershed staff will compile a comprehensive tree inventory and urban forest assessment report for 2022. This report will include the methods, all results and findings from analyses, and implications for urban forest management specific to the City of Lake Forest Park.

B. Coordinate with project team to finalize the report.

We assume one draft version of the 2022 tree inventory and urban forest assessment report will be presented to the project team for review and feedback. A final version of the report will be completed by the end of the year, as determined in the original work plan agreed upon by the project team.

Task 4. Deliverables and Assumptions

- The final 2022 tree inventory and urban forest assessment report, as well as any additional maps or graphics will be made available in PDF format.
- The above-described deliverables assume one draft and one final copy of the comprehensive report. Comments from the City and stakeholders on each deliverable will be compiled into a single document; if multiple reviewers are involved, comments will be consistent among reviewers.

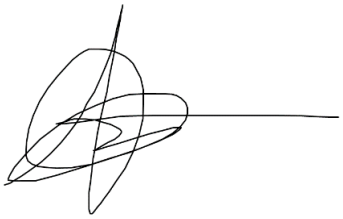
Proposed Schedule

The timeline outlined below is based on experience with similar projects; the timeline given is approximate and does not constitute agreed upon due dates. Actual timeline for deliverables and meeting schedules will be finalized during the project kick-off meeting and work plan development.

Task	Task / Deliverable	AUG	SEP	OCT	NOV	DEC
1	Project Administration and Coordination					
1.A	Project kick-off meeting.	X				
1.B	General project administration and coordination, including meetings with City staff.	X	X	X	X	X
1.C	Establish methodology and data collection. Review all existing metadata and previous methodology.	X				
1.D	Finalize work plan. Set up data collection spreadsheets and digital maps.	X				
2	Plot Inventory and Analysis					
2.A	Conduct baseline field measurements for fixed-radius plots.	X	X	X		
2.B	Compile and organize collected data.			X		
2.C	Data input and analysis in i-Tree and other software. Landmark tree data evaluation and analysis.			X		
3	Canopy Analysis Integration					
3.A	Integrate plot level data with existing canopy analysis. Comparison of canopy analysis with plot level summary statistics.			X	X	
3.B	Overlay plots with remote sensing data for structural analysis.			X	X	
4	Comprehensive Report of Findings					
4.A	Compile i-Tree summary outputs and statistical analysis into comprehensive report, including methodology, findings, and implications for urban forest management.			X	X	X
4.B	Coordinate with project team to finalize report.				X	X

Please call if you have any questions or if we can provide you with any additional information. We look forward to working with you on this exciting opportunity to update the City's tree inventory data.

Sincerely,



Drew Foster
ISA Certified Arborist, PN-8213A
TRAQ certified

Proposal approved by:

Kenny Booth, AICP
Principal / Senior Planner

Enclosures:

- Budget
- Watershed staff rate sheet (2022)

The Watershed Company
City of Lake Forest Park 2022 Tree Inventory
Budget and Scope of Work

Task	Subtask	Description	Kenny Booth, AICP, Principal	Drew Foster, Arborist, Project Manager	Kim Frappier, Arborist	Jake Robertson, Arborist	Nathan Burroughs, GIS Analyst	Total Cost	
			$210	$110	$155	$105	$115		
1		**Project Administration and Coordination**							
1	1.A	Project kick-off meeting.		3	3			$795	
1	1.B	Project administration and coordination, including meetings with City staff.	4	16				$2,600	
1	1.C	Establish methodology and data collection. Review all existing metadata and previous methodology.		4	2		2	$980	
1	1.D	Finalize work plan. Set up data collection spreadsheets and digital maps.		4			4	$900	
								Subtotal	$5,275
2		**Plot Inventory and Analysis**							
2	2.A	Conduct baseline field measurements for fixed-radius plots.		120		120		$25,800	
2	2.B	Compile and organize collected data.		12				$1,320	
2	2.C	Data input and analysis in i-Tree and other software. Landmark tree data evaluation and analysis.		16				$1,760	
								Subtotal	$28,880
3		**Canopy Analysis Integration**							
3	3.A	Integrate plot level data with existing canopy analyses. Comparison of canopy analysis with plot level summary statistics.					24	$2,760	
3	3.B	Overlay plots with remote sensing data for structural analysis.		16			6	$2,450	
								Subtotal	$5,210
4		**Comprehensive Report of Findings**							
4	4.A	Compile i-Tree summary outputs and statistical analysis into comprehensive report, including methodology, findings, and implications for urban forest management.	2	24	4			$3,680	
4	4.B	Coordinate with project team to finalize report.	2	4				$860	
								Subtotal	$4,540
E		**Expenses**							
E		Mileage, Data collection and mapping device, other costs.							
								Subtotal	$ 775.00
								TOTAL	**$ 44,680.00**

THE WATERSHED COMPANY

Hourly Rates Effective January 2022*

Dan Nickel, MSc	Environmental Engineer	$210
Hugh Mortensen, PWS	Senior Ecologist	$210
J. Kenny Booth, AICP	Senior Planner	$210
Al Wald, LHg	Hydrogeologist	$190
Amber Mikluscak, PLA, GISP, MLA	Senior Landscape Architect/GIS Manager	$180
Greg Johnston, EIT, CFP, MSc	Senior Fisheries Biologist	$170
Nell Lund, PWS	Senior Ecologist	$170
Ryan Kahlo, PWS	Senior Ecologist	$170
Mark Daniel, AICP	Senior Planner/GIS Specialist	$170
Marina French, PLA, MLA	Senior Landscape Architect	$160
Kimberly Frappier, MSc	Environmental Planner	$155
Clover McIngalls, PWS	Environmental Planner	$150
Peter Heltzel, MSc, CFP	Fisheries Biologist	$150
Heather Rogers, LG, MSc, WPiT	Planner/Geomorphologist	$150
Katy Crandall, PWS	Ecologist/Arborist	$145
Leila Willoughby-Oakes	Associate Planner	$145
Kyle Braun, PLA	Landscape Architect/Arborist	$140
April Mulcahy	Ecological Designer/Arborist	$135
Roen Hohlfeld, MLA	Ecologist/Arborist/Landscape Designer	$135
Alex Capron	Planner/GIS Specialist	$130
Dawn Spilsbury	GIS Analyst/FAA Licensed Drone Pilot	$130
Sam Payne, PWS	Ecologist/Arborist	$125
Grayson Morris, PLA, MLA, SITES AP	Landscape Architect	$120
Amanda Fleischman, MLA	Landscape Designer	$118
Fern Huynh	Landscape Designer	$117
Nathan Burroughs, MSc	GIS Analyst	$115
Grace Brennan	Ecologist	$115
Bri Hines	Environmental Planner	$115
Devin Melville	Environmental Planner	$113
Hui Cao	Landscape Designer	$112
Alexis Ochoa	Arborist	$110
Drew Foster	Arborist	$110
Debra Klein	Accountant	$110
Brooke Taylor	Accountant/Project Administrator	$110
Betsy Mann	Marketing Manager	$110
Angela Mele	Interpretive Planner	$105
Jake Robertson	Arborist	$105
Sage Presster	Ecologist	$105
Justin Kay	Ecologist	$100
Laura Keil	Landscape Designer	$100
Jesse Rogers	Arborist	$90
Anna Tono	Marketing Coordinator	$75

Acronym Key:

CFP = Certified Fisheries Professional as certified by the American Fisheries Society
EIT = Engineer In Training
LG = Licensed Geologist
LHg = Licensed Hydrogeologist
GIS = Geographic Information System
PWS = Professional Wetland Scientist as certified by the Society of Wetland Scientists
PLA = State of Washington Professional Landscape Architect
AICP = American Institute of Certified Planners
MSc = Master of Science degree
MLA = Master of Landscape Architecture
GISP = GIS Professional

*Rates for 2022 only; escalator clause for cost of living may apply in future years

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Direct Costs

Auto Mileage
Maximum standard rate allowable by IRS

Reproduction:

Black & White Printing	Rate per Page
8 1/2 x 11	$0.10
11 x 17	$0.20
12 x 18	$0.30

Color Printing	Rate per Page
8 1/2 x 11	$1.00
11 x 17	$2.00
12 x 18	$2.50

Plotting	Rate per SF
B&W Bond	$1.05
Color Bond	$1.18
B&W Glossy	$12.18
Color Glossy	$13.76

Outside Reproduction	At cost
Electrofishing Equipment Fee	$100.00/day
Trimble Geo XH - GPS Equipment Fee	$190.00/day
Field Tablet	$20.00/day
Solomat Water Quality Testing Equipment Fee	$50.00/day
YSI Salinity pH Meter	$50.00/day
Expert testimony	Expert testimony is billed at 1.5 times standard hourly rates
Lodging and per diem	Reimbursement will be at a rate not to exceed the WA State OFM per diem rate for location services are provided. Out-of-State locations will be reimbursed at the current GSA rate for location services are provided.
Other Direct Costs At Cost	