



Reforestation Hub Assessment

Prepared for the Arbor Day Foundation and
the City of Eugene



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Key Terms / Abbreviations

Carbon Offset

A certified reduction of 1 metric ton of carbon dioxide emissions. These “carbon credits” are generated by third party-verified projects that reduce atmospheric carbon and are purchased by entities looking to offset other carbon-emitting activities.

Circular Economy

An economic model focused on the continual reuse of resources. Often contrasted with a "linear economy," where products are used once and then retired to an end-of-life state (e.g., in the landfill).

CO₂e

Carbon dioxide equivalent. This is a standard unit of measuring the global warming potential of greenhouse gases, expressed in relation to carbon dioxide emissions.

MT

Metric ton, a unit of mass equal to 1,000 kilograms or 2,205 pounds.

Upcycle

To reuse an object or material in such a way as to create a product of higher quality or value than the original.

Executive Summary

The goal of this assessment is to provide recommendations for development of a full life-cycle management program for public trees in the City of Eugene, Oregon (the City). We identify current opportunities and barriers around wood reuse, as noted by local stakeholders actively involved in urban forest management and wood waste processing. We focus on four key stages of a regenerative “Reforestation Hub” model:

1. Forest Management & Data Collection
2. Urban Wood Salvage
3. Connecting Urban Wood to the Market
4. Strategies for Canopy Restoration

Using tree removal data from fiscal year 2020, an opportunity analysis was constructed for urban wood recycling in the City of Eugene. Based on findings, we offer the following recommendations:

- **Establish a unified asset management system for city tree data.** The current lack of coordination across ArcGIS Collector and the City’s Maintenance Management System has led to information gaps and incomplete record keeping. Establishment of a single system to consolidate individual tree asset data, service requests, and work activities across the City of Eugene’s departments will allow for better management of the urban forest. Consolidation of these information layers can help the City to understand trends in tree canopy loss as well as restoration efforts, and can ultimately support a more data-driven approach for implementation of targeted management strategies.
- **Create a central yard for sorting city logs.** Present utilization is limited by the ability of any one arborist, miller, or city team to make cost effective use of sporadic inflows of wood debris. By prioritizing a single designated collection site for public and private logs, the City of Eugene can help a larger stakeholder network to aggregate and access salvaged wood for secondary use. A project finance model developed to estimate various sort yard scenarios suggests that a yard processing 2,000 removed trees each year could net a total cost savings and revenue generation of up to \$500,000 over 10 years, in addition to 3,856 metric tons of carbon emissions reductions (equivalent to 839 passenger vehicles driven for one year).
- **Build communication channels to enable urban wood salvage.** A theme identified throughout our interviews was a lack of communication between key stakeholders across the urban wood life cycle. We believe that efforts by the City to coordinate

Key Numbers:

996
Right-of-way trees
(average diameter 15 in)
removed by Urban Forestry
in FY 2020

\$152,327
Potential economic value of
those removed trees

\$447,566
Net present value of a
wood waste recovery yard
(processing Urban Forestry
and Eugene Water & Electric
Board tree removals)

planned removals across internal crews and private sector partners can be a vital next step to enabling a large-scale wood utilization program. Whether through developing a central communications channel or an incentive program to encourage participation in wood recycling efforts, the City can help convene and organize key players to increase wood utilization in Eugene.

- **Align reforestation efforts to modern financing mechanisms.** Modern funding opportunities — including corporate sponsorship for environmental projects, impact certification, and carbon crediting — are designed to fund impactful projects, not institutions or programs generally. Successful urban forestry systems today feature networks of public and private stakeholders who codevelop impactful projects and effectively market those projects to potential sponsors. We recommend that the City leverage the upcoming Urban Forest Visioning and Action Plan process to convene both traditional actors (city departments, local environmental nonprofits, and tree care businesses) and new stakeholders such as health institutions, housing authorities, and chambers of commerce. We further recommend that a new partnership be formed — modeled after the Rivers to Ridges Partnership — focusing on a common vision, inclusive planning, and shared responsibility for implementation. The goal should be a diverse project pipeline that incentivizes and supports planting efforts by private landowners, maintains strong public land programs, and assures prospective funders that projects have broad support in the community and are developed in an inclusive and equitable manner.

Project Background/Our Team

Cambium Carbon is a social impact venture working to reforest America by enabling local wood economies. The company is born out of the World Resources Institute and has been developed through the Yale School of the Environment's entrepreneurship program.

This assessment is prepared for the Arbor Day Foundation and the City of Eugene, as part of a Reforestation Hub development project funded by The Nature Conservancy's Natural Climate Solutions Accelerator Grant Program. Eugene was one of three cities selected from a pool of more than 30 applicants for this project.

Our team draws from a deep network of partners from the fields of environmental science, urban forestry, workforce development, and climate finance. Cambium Carbon has leveraged these networks to produce this detailed assessment for the City of Eugene, which addresses the facets of Reforestation Hub development most aligned with the City's local goals and complementary initiatives.

Methodology

Cambium Carbon conducted 23 stakeholder interviews with organizations involved in management of Eugene's urban forest, in addition to local millers and wood product buyers. Interviewees included city officials, private arborists, and NGO partners. Conversations were aimed at understanding current wood debris management practices, assessing local capacity gaps, and identifying opportunities and barriers to wood reuse and new tree planting.

A survey of active local arborists was used to supplement interviews. Additional background information — including tree removal data for fiscal year 2020 — was provided by Scott Altenhoff, Urban Forestry Management Analyst at the City of Eugene Parks & Open Space division.

Part 1: Forest Management & Data Collection

Key Players

Our analysis begins with a look at the organizations actively involved in management of Eugene’s urban forest. The following table provides an overview of several of the largest stakeholders in the local urban forestry network:

Table 1: Urban Forestry Stakeholders

Category	Division/Organization	Program Area/Jurisdiction
City of Eugene	Parks & Open Space (Department of Public Works)	Urban Forestry
		Natural Area Operations
		Park Operations
	Maintenance	Streets and public right-of-way
	Planning & Development	Tree permitting and removals
Nonprofit	Friends of Trees	Community tree planting
Private Arborists	Four Seasons Trees	City contract work
	Multiple (Sperry Tree Care, Artistic Arborist, etc.)	Private property tree work
Public Utility	Eugene Water & Electric Board	Power line maintenance

The City of Eugene **Parks & Open Space** division encompasses three forest management programs — Urban Forestry, Natural Area Operations, and Park Operations — responsible for the various types of green space in and around the city. Local nonprofit partner **Friends of Trees** is a critical collaborator on efforts to regenerate tree canopy through community-based outreach and planting programs.

Private arborist company **Four Seasons Trees** currently holds the City’s contract for primary tree work, handling pruning, tree removals, and replanting services on public land. In addition, the **Eugene Water & Electric Board** manages a significant portion of urban canopy growing along utility lines within the city. Finally, several larger regional and national organizations, such as the **Oregon Department of Forestry** and the **International Society of Arboriculture**, provide resources and programmatic support for community forestry efforts within the city and the region.

Data Collection

Tree data and record keeping systems play a critical role in sustainable forest management. This section looks at the various methods for tracking tree outcomes across Eugene's landscape.

Public Land

Currently there are two primary systems used by the City of Eugene to monitor and communicate tree-related records on city-managed lands:

- **Maintenance Management System (MMS)**, a proprietary software built for in-house use by the City's Department of Public Works, which handles tracking of service requests
- **Collector for ArcGIS**, used by the Urban Forestry team to manage the City's active tree inventory, work orders, and work activities

While MMS serves as a larger database for Public Works, the system was not set up to meet the specific needs of urban forest management. As a result, information has been translated into Collector for use by the City and its local partners. Because data is spread across these unintegrated systems, there is no central reference point for all information regarding an individual tree. For example, a work order for a hazard response pruning can be logged to a site ID independent from the street tree's inventory ID and other existing records. The result is that various stakeholders involved in urban forest management are operating in information silos. In addition, analyzing year-over-year changes becomes difficult, given these patchwork datasets.

Shelly Miller, Supervisor of Public Works' Ecological Services and GIS Teams noted that for habitat restoration projects, tree removals are not individually tracked. Although past merchantable timber sales have been reported on a per project basis, there is not much use of Collector for tree removals. Instead, Ecological Services uses ArcGIS more commonly for one-off project maps as needed. On the planting side, trees are monitored and watered for the first three years of establishment.

Private Land

The City of Eugene's Department of Planning and Development oversees tree removal permitting on private property, which makes up an estimated 75% of the city's urban forest. Permits are required for trees on lots larger than 20,000 square feet, or in cases where land falls within a designated conservation area. Because most jobs meet an exemption to the tree removal permit requirements, private contractors are free to conduct tree work and removals without notification or authorization. Planning Specialist Matt Denberg noted that *"The vast majority of trees removed on private property are done without a tree removal permit or any notification to the City."* It was further noted that the Land Use program does not collect data to track the cumulative number of trees approved for removal each year.

Local tree planting nonprofit Friends of Trees runs a community planting program that provides street and yard trees throughout Eugene's neighborhoods. Although the organization maintains a 30-year-old database of planting records, the system operates independently from City

records. A priority “wish list” item for Erik Burke, Director of Friends of Trees’ Eugene program, is a new database to track and prioritize pruning work with integrated equity recommendations. While the staff has been modernizing its field operations and moving to iPads for onsite record entry, an opportunity exists to update data collection practices to better tie into the City’s inventory and priorities.

Recommendations

Cambium Carbon has developed the following recommendations toward streamlining data collection and improved urban forest management in Eugene:

- **Establish a unified asset management system for community tree data.** Interviews with City staff suggest that although the Parks & Open Space program teams are housed in the same building and shared aligned work streams, communication and programmatic efforts across the three are largely uncoordinated. Aggregating all tree data collection (including planting information, work order history, and inspection information) into a single database can serve as a first step in improving information availability and coordinating forest management efforts across the City’s stakeholder groups. Synchronization of these isolated data layers will be critical in leveraging collective resources toward maximum community and environmental benefit. This goal can most effectively be achieved by beginning to move all data stored on MMS into an ESRI Enterprise system. This unified system will open new opportunities for communication and collaboration across departments and free up IT capacity to support staff training and adoption of ESRI software.
- **Explore opportunities to increase reporting of private property tree loss.** Present oversight of private land management is minimal, leaving an incomplete picture of tree canopy change across public and private landscapes. A coordinated effort with the City’s Planning & Development Department could open new doors for monitoring tree loss on private property. Possible levers to increase reporting of private tree removals include:
 - Making tree removal reporting a requirement to be a city-designated Registered Tree Service Provider (ex: [Seattle’s city landing page](#)).
 - Lowering the threshold for required reporting of tree removals in the construction permitting process. For example, in the **City of Austin (TX)**, development applications must include a tree grading and protection plan and demonstrate an effort to retain all trees eight inches or larger in diameter. In addition, any tree within city limits larger than 19 inches in diameter is given “protected” status and requires permitting for removal.
 - Establishing a voluntary system for reporting of tree removals, marketing the system to key stakeholders, and providing incentives for adoption.

Integration of new data collection practices to capture tree removals on private land can enable proactive wood salvage efforts while informing management strategies to combat neighborhood canopy loss.

Part 2: Urban Wood Salvage

Wood Salvage Stakeholders

There are three central sources of wood waste generation and management in Eugene: **public tree work** managed by the Department of Public Works, **utility maintenance** conducted by the Eugene Water and Electric Board, and **private removals** orchestrated by independent local arborist companies. The following section examines tree removal practices by actors in these three categories.

Public Tree Removals

Interviews with staff throughout the Parks & Open Space division suggest that most publicly managed tree removals are chipped for use as mulch across public landscapes or made available to community members. Residual chipped material is either utilized for natural area habitat restoration or taken to local organic waste recyclers.

At present, tree work for the Urban Forestry Division is outsourced through a five-year contract held by **Four Seasons Trees**, a local private arborist company. For this type of tree work, disposal of wood waste becomes the responsibility of the contractor. Four Seasons Trees typically chips trees of small (7–10 inch) diameter and disposes at farms and community gardens or takes residual material to private organic recyclers **Lane Forest Products** and **Rexius**. Large logs are occasionally given away to local producers that sell firewood, with the rest taken to Lane Forest Products or Rexius for final disposal. Typical daily generation is roughly two 12-foot truckloads, or approximately **32 cubic yards** of wood debris.

The City of Eugene owns a significant network of natural areas, including a Ridgeline Park system of roughly 2,500 acres. The Natural Area Operations team manages forest stewardship on this acreage and has been focused on bringing degraded land into the Park system for restoration. Some of these restoration efforts provide a unique opportunity for wood reclamation, and the team will on occasion hire a forestry consultant to assess the value of wood removed to meet ecological goals. In one such case, roughly 400,000 board feet of Douglas fir was removed from native oak habitat and sent to a local mill for processing.

While there may be similar opportunities to upcycle woody biomass generated in future restoration projects, key barriers include distance and density of tree removals. Because these projects often occur some distance from the nearest wood collection or processing facility, the low volume of material is typically insufficient to merit offsite transportation. In addition, while Seneca Sawmill has on occasion taken wood chips from restoration work, the company's recent demand for supplemental inflows of material has been low. Due to the difficulty in finding proximate end users, much of the wood waste generated is piled and burned. While mobile

wood processing technologies¹ offer possible solutions, a cost-benefit analysis should be conducted to weigh anticipated inputs and outcomes against upfront investment.

Eugene Water and Electric Board

The Eugene Water and Electric Board (EWEB) maintains vegetation near power lines throughout the city. For normal pruning work, limbs and brush are chipped and made publicly available through a free chip giveaway program. Customers can call in and request chips, and EWEB will deliver if space is available to dump. Chip requests handle most of the generated volume, although disposal is not always convenient.

EWEB removes approximately 1,000 trees per year, predominantly on private property. Most removals are cut into short length rounds and are left onsite for the property owner. While some customers do ask that logs be cut to longer millable lengths, shorter cuts are prioritized due to safety considerations in taking down larger pieces. For public tree work, EWEB does provide full cleanup, including stump grinding and hauling of debris. While some material is taken to Lane Forest Products, this is increasingly rare.

Shane Tennison, utility forester for EWEB noted that a central sorting yard — ideally in close proximity to where trucks are overnighted — could provide three main benefits: lowering disposal costs, reducing required preprocessing (e.g., splitting or cutting to certain lengths for disposal), and allowing EWEB to offer wood waste management to more of its individual clients. Although job costs increase when specific machinery such as an excavator is required, having a free disposal site would allow EWEB crews to take on additional equipment costs and offer more removal services.

Private Arborists

A survey of active arborists in Eugene found that companies generated between 20 and 200 cubic yards of wood waste per month, averaging **122 cubic yards** (roughly 50 tons) per company. Average price for disposal was less than \$20 per ton, with many dropping material at Lane Forest Products for a **\$4 per cubic yard** (roughly \$10 per ton) fee. All respondents indicated they would be interested in alternative opportunities for wood waste disposal. Comments and suggestions from local arborists included a desire for a site to drop off usable wood for secondary use, as well as individual interest in milling wood collected from the urban forest.

Strategies for Wood Waste Processing

Our interviews and analysis suggest that there is opportunity to increase higher-value utilization of urban wood in Eugene. The following section explores models for implementing a citywide wood salvage program.

¹See also research from the [USDA Forest Service](#)

Option 1: Central Sorting Yard and Processing Site

Using data on Eugene’s tree removals from fiscal year 2020, canopy information, and research conducted with local and national millers, Cambium Carbon has built a simple economic and impact model for a central sorting yard for processing woody material. It should be noted that this model does not imply a specific ownership structure: possible options include a municipally run program, a public-private partnership, or a privately managed operation. While there are pros and cons to each of these arrangements, the focus of this model is to provide a high-level evaluation of potential costs and revenues generated through processing urban wood.

The baseline scenario focuses on the roughly **806 metric tons** of annual wood biomass generated by Urban Forestry’s in-house tree removals. We project an estimated **\$276,500** in initial upfront capital expenditures for sorting yard infrastructure. Revenues are modeled based upon sale of various processed wood products, operational expenses, and avoided disposal costs from third-party tipping fees.

Additional scenarios are used to explore alternative outcomes from various input changes, including:

- An upside case, in which more high-value material is captured from reclaimed logs and sold at a higher price.
- Integration of removed logs from the Eugene Water and Electric Board, doubling the inflow of material through the site.
- A special “Springfield” case that includes an additional cyclical supply of poplar from the BioCycle farm.

Using a 10% discount rate, our model produced the following outputs for each scenario:

Table 2: Economic Model Results for Sorting Yard Scenarios

KEY RESULTS			
Scenario	max annual capture (MT)	NPV (\$)	CO ₂ e benefit (10-year MT)
Base: Urban Forestry Removals	727	(249,132)	1,928
Upside	766	514,980	2,564
Including EWEB	1,455	447,566	3,856
Springfield: (Base + 5-year BioCycle Farm Harvest)	870	(218,731)	2,005

Our analysis suggests that, given the fixed costs required to establish processing infrastructure and a 2–3 person site crew, increasing the volume of material handled would be a critical driver of project success. Our baseline scenario considers only removals through Urban Forestry’s annual work orders and is net-negative over a 10-year time horizon. That said, there is significant room to accept additional sources of urban wood. Incorporation of material from other local wood waste generators (such as EWEB, private sector arborists, and Natural Areas management projects) can leverage economies of scale in shared processing infrastructure and increase total net return on investment. Given the City’s strong connection with local arborists, it seems likely that many would agree to drop material at this new site, particularly if whole-log disposal was free (or cost-competitive with market rates).

Option 2: Outsourced Milling through Local Processors

An alternative option is to reduce total infrastructure costs for a city sort yard by outsourcing processing of reclaimed wood directly to existing millers. This could take the form of contracted milling, in which a private partner provides portable milling services, exemplified by the City of Cincinnati’s Urban Timber Program.² The program generated 20,000 board feet per year of wood for use in renovations by Cincinnati Public Schools. This model could provide a low-cost option for ad-hoc processing of collected logs on the site, managed by contracted millers with equipment and technical expertise.

A similar model for avoiding capital expenditures and full-time staffing of a central yard is that employed by the City of Eau Claire, Wisconsin (see the following case study). This model employs coordination of private millers under a common “Use Agreement” to transfer ownership and management of generated material to local businesses that can make use of the material. This option is geared toward maximizing total wood reuse and community economic benefit but does not serve as an active revenue generator for the City of Eau Claire and its forest management programs.

For additional context on total economic potential, Table 3 estimates the value of Urban Forestry’s annual removals, based on canopy demographics. *Note: These projections reflect an upper bound for economic capture (assuming that all removed trees are capable of being milled for high-value lumber products).*

² <https://www.fs.fed.us/research/docs/webinars/urban-forests/reclaimed-urban-wood/slides-gamstetter.pdf>

Table 3: Potential Value of Tree Removals in Eugene, OR, FY 2020

Total Removals FY 2020 - avg. 15 in diameter **996**

Tree Inventory Data							Removed Trees				
Species	Count	% total	% Good	% Fair	% Poor	% Dead	# Removed (estimated)	MT CO2 storage per tree (iTree)	Average merchantable weight (MT)	BF removed per species	estimated potential \$ value
Maple	17,438	20.2%	16.9%	70.5%	5.1%	2.4%	201	0.98	163.0	10,266	\$30,797.61
Oak	10,161	11.8%	21.8%	66.9%	3.2%	1.8%	117	0.56	95.0	5,979	\$17,936.07
Ash	8,993	10.4%	12.0%	67.0%	6.6%	2.4%	104	0.74	84.1	5,293	\$15,878.83
Douglas Fir	7,745	9.0%	26.2%	59.8%	3.8%	3.6%	89	0.19	72.4	4,556	\$13,669.20
Cherry	3,413	4.0%	16.2%	70.0%	6.6%	4.9%	39	0.66	31.9	2,006	\$6,019.33
Pine	3,217	3.7%	20.3%	58.4%	6.0%	4.5%	37	0.62	30.1	1,895	\$5,684.07
Cedar	2,714	3.1%	19.9%	66.0%	4.5%	2.9%	31	0.92	25.3	1,595	\$4,784.98
Birch	2,535	2.9%	9.8%	40.4%	29.4%	17.9%	29	0.93	23.7	1,493	\$4,480.21
Sweetgum	2,500	2.9%	10.9%	77.9%	4.3%	4.6%	29	0.53	22.8	1,473	\$4,419.25
Other	27,583	31.9%	14.5%	65.9%	6.7%	3.8%	318	0.68	257.6	16,219	\$48,657.49
								693	805.8	50,776	\$152,327.04



CASE STUDY: EAU CLAIRE, WISCONSIN

In 2012, the **City of Eau Claire** began thinning local ash trees in response to detection of Emerald Ash Borer. This process raised the question of how the city could prevent valuable wood from going to waste. Rather than turn removed trees into mulch or pulpwood, the city partnered with members of the nonprofit **Wisconsin Urban Wood** to help local artisans and businesses put culled ash trees to better use.

With support from the **Eau Claire Chamber of Commerce**, the city devised a legal “Use Agreement” allowing Wisconsin Urban Wood members to process and sell logs from the city’s sort yard through their businesses. This transfer of title was made possible by an acknowledgement that the city’s avoided processing costs were of benefit to the public. The result was a reduction in chipping and disposal costs, and an increase in wood reuse within the community.

While the City of Eau Claire maintained the sort yard and granted access during scheduled hours, Wisconsin Urban Wood members were responsible for any damage incurred. Furthermore, while members could bring portable sawmills on site, the City was not obligated to provide support in handling and processing of material. Logs were allocated to individual local businesses by Wisconsin Urban Wood, and partners were required to report records of species and quantities taken from the site.

Matthew Staudenmaier, Forestry Supervisor of the City of Eau Claire, discussed the success of this public-private partnership as a means of limiting city liability while supporting job creation and urban wood utilization. Staudenmaier emphasized the importance of creating fewer entities to negotiate with (as opposed to individual end users of urban wood). In addition, collaboration with the State **Department of Natural Resources** was an integral step for Eau Claire in helping to share ideas and bring stakeholders together.

Further Reference:

- <http://wisconsinurbanwood.org/wp-content/uploads/2017/03/4.19.16.Front-Page-Eau-Claire-Leader-Telegram.pdf>
- <http://wisconsinurbanwood.org/sample-municipal-models/>
- <http://wisconsinurbanwood.org/wp-content/uploads/2017/03/WUW.Use-Agreement-Blank.pdf>
- <https://www.youtube.com/watch?v=WGjvXBqEQjU>

Note: this case study was provided with support from graduate student researchers at the Yale School of Environment

Recommendations

Analysis of current and potential wood utilization in Eugene leads us to the following recommendations:

- **Establish a central sorting yard** to aggregate logs generated by tree removals on both public and private landscape. While this site could be either actively managed or more loosely coordinated by the city, creation of the yard would be a first step in achieving economies of scale in debris collection/processing and ultimately connecting logs to potential secondary use.
- **Improve coordination of wood waste management systems** within and external to the City of Eugene. Designing and communicating recommended pathways for wood waste disposal will be important to maximizing value from the city's total wood waste stream. Tools such as mandating disposal locations in City contracts or recommendation of a preferred upcycling location will be critical to leveraging shared infrastructure across various urban forestry actors. For example, coordination of upcoming natural areas restoration work can help identify opportunities for shared transportation and processing equipment to be used by multiple teams within Parks & Open Space, thereby reducing costs and increasing potential for wood salvage.

Part 3: Connecting Urban Wood to the Market

Lessons from the National Network

Over the past year, Cambium Carbon has worked with urban wood millers and buyers in eight U.S. cities. As a result, our needs assessments are informed by both national-level trends and specific local context. While each city’s regional landscape varies, a few overarching themes have emerged in characterizing the state of urban wood utilization. We believe these trends can provide valuable context in setting the stage for a wood salvage program in Eugene:

- **Small-scale urban wood utilization exists** in many communities across the country. These boutique outfits access a small portion of available supply and reach a small number of high-end wood product buyers.
- **Education is a key driver of market development.** Our research and interviews have found that wood product buyers have an overwhelmingly positive response to the local and sustainable impact of urban wood. Yet awareness of reclaimed wood (either from deconstruction or fresh-cut salvage) is low, and buyers from architects to individual homeowners struggle to access this sustainable material consistently.
- **Urban wood millers and woodworkers are resource-constrained.** These small businesses can very rarely scale their salvage, milling, and drying operations while simultaneously developing the comprehensive sales and marketing plans to meet increased production.

Eugene Context

We contacted 76 wood millers, product manufacturers, and potential buyers in the Eugene area. In addition to large-volume users of lower-grade material (such as Rexius and Lane Forest Products), we also connected with several architects, designers, and local retailers interested in supporting the growth of an urban wood circular economy in Eugene. Key stakeholders are listed in Table 4.

Table 4: Key Stakeholders for Urban Wood Utilization

Potential Urban Wood User	Quality Grade	Sample Product Applications
9Wood	High	Custom wood ceilings
BRING Recycling	High	Fabricated wood products (e.g., cabinetry, shelving, lumber)
City of Eugene	Low to High	Picnic tables, tree guards, municipal building applications
Curly Burly Milling	High	Custom sawmilling for woodwork and carpentry (cabinetry, flooring)

Epilogue Urban Wood	High	Dimensional lumber, live edge slabs
Lane Forest Products	Low to mid	Mulch, compost, soil amendments (potential biochar user)
Long Tom Custom Sawmill	Mid to high	Slabs, custom milling
Maccabee Designs	High	Cutting boards, desks
Oregon Wood Slabyrinth	Mid	Air-dried slabs
Rexius	Low to mid	Mulch, soils, compost
University of Oregon	Mid to High	Fixtures and furnishings for campus facilities, woodshop/architecture studio applications
Urban Lumber Company	High	Furniture (desks, tables, chairs), doors, woodworking (bowls)

Eugene’s rich history in forestry and wood products makes it a unique case study in urban wood salvage. It was immediately clear from outreach and interviews that both public and private actors are interested and excited about a sustainable solution for wood waste utilization. Nevertheless, a consistent and scalable model has yet to be adopted. This leads us to consider both supply- and demand-side barriers to implementation.

Eugene’s local pride and excitement make it an ideal place for locally sourced, locally impactful products. Outreach to local retailers generated consistent interest in showcasing urban wood products. At a larger scale, the prevalence of desirable hardwood species throughout the city’s canopy presents a great opportunity to integrate urban wood into commercial products. Local manufacturer **9wood** — a custom wood ceiling company — has worked with the neighboring City of Springfield to utilize BioCycle Farm’s poplar harvest, yet the company has struggled to make use of urban wood due to the inconsistency of supply and projects.

Nevertheless, other stakeholders noted that there is a significant untapped pool of material within the city. Local millers specializing in urban wood — like Oregon Wood Slabyrinth — suggested that opportunities to salvage logs are endless. However, the process of coordination is currently too onerous, detracting from time needed to process and sell that wood. All the millers interviewed expressed a desire for more effective communication with City officials or contractors responsible for removals. Additionally, a centralized sorting yard would enable smaller players with portable equipment — like Curly Burly Milling — to access and utilize more of the area’s urban wood supply. Given the excess of existing material, it is clear the current resources and millers could benefit from additional support in accessing and selling urban wood throughout the region. As expressed by one miller, “I’m just a worker bee in this system. I could salvage logs all day every day, but nothing else would get done. We need a larger actor to come in and help facilitate the other pieces of this system.”

Recommendations

Our research and stakeholder interviews suggest that Eugene possesses all the components for a robust circular economy for urban wood — from existing infrastructure and markets to under-utilized supply. Nevertheless, **better aggregation of harvested logs** is a critical next step in developing the economies of scale and supply chain consistency required by processors and purchasers. Because urban wood availability is highly variable, with incoming species and size ranging widely by year or season, consolidation of multiple waste streams is important to achieving critical mass and smoothing supply shocks. That said, the following strategies are recommended to connect material to the market more efficiently:

- **Develop a central sorting yard** — whether operated by the City or privately run — to provide easy access to millers looking to make use of harvested logs. It should be noted that in addition to the options discussed in the previous section, several existing private-sector processors expressed interest in collecting or processing urban logs. These players could present an option for development of a private collection yard. However, tipping fees and intake requirements may reduce the total volume of material captured in such a scenario.
- **Strengthen communications between the City and private partners.** From arborists to local millers, many stakeholders noted a lack of clear communication channels with the City as a barrier to urban wood utilization. Simple engagement tools (such as a notification platform to alert partners of upcoming planned removals and material availability) could dramatically increase the amount of wood connected to a secondary user.

Part 4: Strategies for Canopy Restoration

The stakeholders we interviewed for this assessment report both a growing sense of urgency to address canopy loss and optimism around the rising popularity of using tree planting as a nature-based solution to climate change. Emerging urban wood markets are one of many new potential sources for sustainable urban forestry financing that can help. This section addresses trends in tree planting finance nationally and provides recommendations for preparing Eugene to access and benefit from new revenue streams.

National perspective on urban forestry financing

Building robust programs for canopy expansion requires new approaches to project finance. This is particularly relevant considering that 75% of urban forest land in Eugene is privately owned. If urban forest investment is to increase significantly, it will require more than additional tax revenue for existing forestry programs or permit receipts for removals. It will require new financing that specifically rewards and incentivizes preservation, planting, and active management — whether located on public or private land.

Traditional programs are characterized by program-based financing. For example, a city budget funds a forestry program to improve management of trees on public property. Similarly, private and public donors support local nonprofits, such as Friends of Trees, that provide urban forestry programs and services for their communities. Along with tree boards, parks, open space conservancies, and similar civic institutions, these traditional groups form the backbone of urban forestry systems that have a new opportunity to meet the demand for high-impact projects.

Table 5: Comparison of Financing Models for Urban Forestry

	Traditional Urban Forestry	Emerging Financing Models
Project-based Funding	Residential & commercial planting Development-required planting Private actions One-off contracts	Carbon crediting Impact crediting Noncredited ESG/CSR activities
Program-based Funding	Municipal programs Yard tree incentives and subsidies On-call contracts Stormwater credits	Program-related investment (PRI) Pay-for-success/outcomes-based financing

Project-based finance supplies funds to public or private entities implementing specific projects with defined locations and timelines. For example, carbon markets function because project developers submit verified projects based on standard protocols. Rather than funding various programs to plant trees or reduce carbon generally, carbon buyers specifically purchase credits from vetted projects on one or more registries. Project-based systems also reward innovation by reducing barriers to entry for project developers — anybody who wishes to develop, register, and verify a project can submit credits for sales on open markets. It does not matter whether projects are located on private or public property, so long as they achieve the protection, monitoring, and verification standards of registries and buyers.

Today, most urban forest projects do not meet the criteria for traditional carbon markets, but alternative project registries and protocols are being developed to close this gap. For example, **City Forest Credits** has developed an Impact Certification Standard. This program is designed as an alternative financing pathway that incentivizes private sponsorship of tree planting projects. Impact certification does not require the same legal or timeframe commitments of a carbon project, and projects are scored according to human health, social equity, and environmental impacts. This scoring and certification process is intended to help communicate the multifaceted value of specific tree planting efforts to potential corporate funders.

The Urban Forest Vision and Action Plan

Eugene's current effort to develop an Urban Forest Vision and Action Plan is an opportunity to prepare for emerging project-based financing models by building community support for a pipeline of well-crafted urban forestry projects.

The **Rivers to Ridges Partnership** is a strong example of a local organization developing project-based work with a track record of successful project implementation. This can serve as a guide for the administrative structure of a similar partnership focused specifically on expanding healthy and equitable urban canopy in Eugene. Key features of this partnership include shared visioning and goal setting, mutual support, and distributed implementation responsibilities (members are implementers, not the partnership itself).

Stakeholder Roles and Responsibilities

Key stakeholders include private commercial and residential landowners, community associations, watershed councils, tree care companies and nurseries, Friends of Trees, and those businesses who wish to associate their brand with high-impact, community-centered tree planting projects.

Next Steps

The following recommendations are offered to the City of Eugene as initial actions leading to the establishment of a Reforestation Hub.

- **Establish a central repository for public and private wood debris.** Creation of a central sorting yard is a key bottleneck to urban wood utilization. Our project finance model suggests that upcycling Urban Forestry and Eugene Water & Electric Board tree removals alone could net up to half a million dollars over 10 years, in addition to storing 3,856 metric tons of CO₂e.
 - **Next Steps:** Identify suitable sites for permanent wood waste collection, such as sites previously used for storm debris.

- **Work with the International Society of Arboriculture (ISA) chapter and local municipalities to improve education and facilitate increased secondary log use.** Education of arborists, such as the prioritization of cutting logs to millable lengths, can play a critical role in increasing wood utilization for high-value products.
 - **Next Steps:** Engage in urban woodworking groups, such as the Oregon Chapter of the Urban Wood Network, to set collective best practices for salvage.

- **Improve tree data collection and technology solutions.** Utilizing technology will be critical to measuring and managing tree removals in Eugene. By extension, a system with 'live' data can connect the wood waste stream supply with demand by users.
 - **Next Steps:** Establish a unified asset management system for urban tree data. Develop a 'live' record system for tree removals and a cohesive strategy for targeted wood waste management and urban forest restoration.

- **Enable scalable forest regeneration through increased nursery capacity.** Although not a primary focus of this analysis, interviews revealed that the current supply of quality tree stock presents a key bottleneck in scaling urban forest restoration.
 - **Next Steps:** Develop infrastructure to increase access to quality tree stock for the City of Eugene and local partners.

- **Increase awareness of the role of urban forests in the carbon cycle.** Education and quantification of carbon storage in live trees and durable wood products can help increase wood waste utilization and preservation of urban trees.
 - **Next Steps:** Incorporate carbon accounting into training of municipal foresters, arborists, and urban planners. Explore carbon crediting for new tree planting.