CITY OF CHICO

URBAN FOREST MASTER PLAN

Prepared by

DUDEK

February 2023

TABLE OF CONTENTS

TABLE OF CONTENTS

Cover photo by Lori Eckhart

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ACKNOWLEDGEMENTS

ACKNOWLEDGEMENTS

MAYOR
Andrew Coolidge

VICE MAYOR
Kasey Reynolds

CITY COUNCIL
Dale Bennett
Sean Morgan
Deepika Tandon
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CITY STAFF

BIDWELL PARK AND PLAYGROUND COMMISSION

FUNDING PROVIDED BY
CAL FIRE & Cal Climate Investments

PREPARED BY
Dudek – Urban Forestry Division

WITH SUPPORT FROM
Butte Environmental Council
Chico Urban Forest Master Plan Working Group

BIDWELL PARK AND PLAYGROUND CHARTER, MUNICIPAL CODE SECTION 1006
The council shall be responsible for the propagation, planting, removing, pruning, and maintenance of all trees and shrubberies on the streets and along the sidewalks of the city. The council shall adopt such ordinances as may be necessary to exercise such responsibilities and may in such ordinances delegate the responsibility to any other board, commission, or department of the City as it determines.

Funding for this project is provided by the California Department of Forestry and Fire Protection as part of the California Climate Investments Program. The City of Chico Urban Forest Revitalization Program is part of California Climate Investments, a statewide program that puts billions of Cap-and-Trade dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment– particularly in disadvantaged communities. The Cap-and-Trade program also creates a financial incentive for to invest in clean technologies and develop innovative ways to reduce pollution. California Climate Investments projects include affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, more sustainable agriculture, recycling, and much more. At least 35 percent of these investments are located within and benefiting residents of disadvantaged communities, low-income communities, and low-income households across California. For more information, visit the California Climate Investments website at: *www.caclimateinvestments.ca.gov*.

VISION

CITY OF CHICO
INC. 1872

Our urban forest is a resilient network of trees that is sustainably managed by the City and residents, providing equitable social, economic, and ecosystem benefits to all residents and habitat for wildlife, and reflects Chico's identity and legacy as the City of Trees.

Photo by Sigmund Sieminski

ACRONYMS & ABBREVIATIONS

Acronym/Abbreviation	Definition
BEC	Butte Environmental Council
BPPC	Bidwell Park and Playground Commission
CAL FIRE	California Department of Forestry and Fire Protection
CARD	Chico Area Recreation and Park District
DSH	diameter at standard height
DSM	digital surface model
FTE	full-time equivalent
GHG	greenhouse gas
ISA	International Society of Arboriculture
nDSM	normalized digital surface model
RPI	relative performance index
SCN	South Campus Neighborhood
SWRP	Storm Water Resource Plan
TES	Tree Equity Score
TRAQ	Tree Risk Assessment Qualification
UFMP	urban forest master plan

Photo by Lori Eckhart

EXECUTIVE SUMMARY

Why Does Chico Need a UFMP?

Adaptation to changing environmental conditions is becoming increasingly important in Chico. Ongoing drought conditions, increased days of extreme heat, and catastrophic wildfires reflect adverse impacts to the environment brought on by climate change. In response, the State of California has passed legislation like Senate Bill 32 mandating cities develop Climate Action Plans that provide a strategic framework to reduce greenhouse gas emissions and promote resilient communities. Additionally, Executive Order B-55-18 sets a goal of carbon neutrality in California by 2045, which can in part be supported by tree planting and preservation of canopy cover.

Preserve Canopy Cover

Ensure that Chico's high level of 36% canopy cover continues to support climate resiliency for current and future community members.

Extreme Heat

Chico is projected to average 16–30 extreme heat days per year by 2030 (Cal-Adapt 2017).

Storm/Flooding Events

Intense storms are projected to overwhelm local waterways and threaten the integrity of flood control structures (Butte County Department of Water Resources and Conservation 2016).

City Policy – General Plan Safety Element

Goal S-9: Protect the community from risks posed by climate change.

Policy S-9.1 (Climate Adaptation and Resiliency) - Promote public safety through the development of climate adaptation and resiliency strategies to reduce risks associated with climate change.

Action S-9.1.1 (Climate Change Adaptation) - Update the Safety Element or the City's Local Hazard Mitigation Plan to include climate adaptation and resiliency strategies consistent with Senate Bill 379, including preparation of 1) a vulnerability assessment that identifies community risks associated with climate change; 2) a set of adaptation and resilience goals, policies, and objectives for the protection of the community; and 3) implementation measures to avoid or minimize climate change impacts.

Urban forests help to create resilient communities by providing cooler temperatures during extreme heat, intercepting and storing stormwater, and offering cleaner air to those who live beneath the tree canopy. Growing and maintaining a sustainable urban forest will help ensure trees continue to deliver maximum levels of these vital services when adverse conditions arise.


NO PERSON SHALL
REMAIN IN
CITY PLACE
BETWEEN
2:00 a.m. & 5:00 a.m
EXCEPT PASSING
THROUGH TO
ANOTHER DESTINATION
LMC 120.04.370

CANOPY COVER ANALYSIS

Canopy cover refers to the layer of leaves, branches, and stems that provide tree coverage of the ground when viewed from above. Tree canopy cover has a positive impact on communities as it provides many environmental benefits and services, such as shade, cooler temperatures, improved air quality, improved stormwater quality, enhanced community character, improved mental and physical health, as well as an overall improved quality of life. Chico currently has a canopy cover of 36% within its developed area footprint, which has increased by 1% from 2005 (see **Table 1** and **Figure 1**, **Canopy Cover Map**). This high level of canopy cover, and its continued growth, supports the statement that Chico is known as the "City of Trees" and that City-wide efforts to maintain the dense canopy cover are resulting in a robust urban forest.

Figure 1. Canopy Cover Map

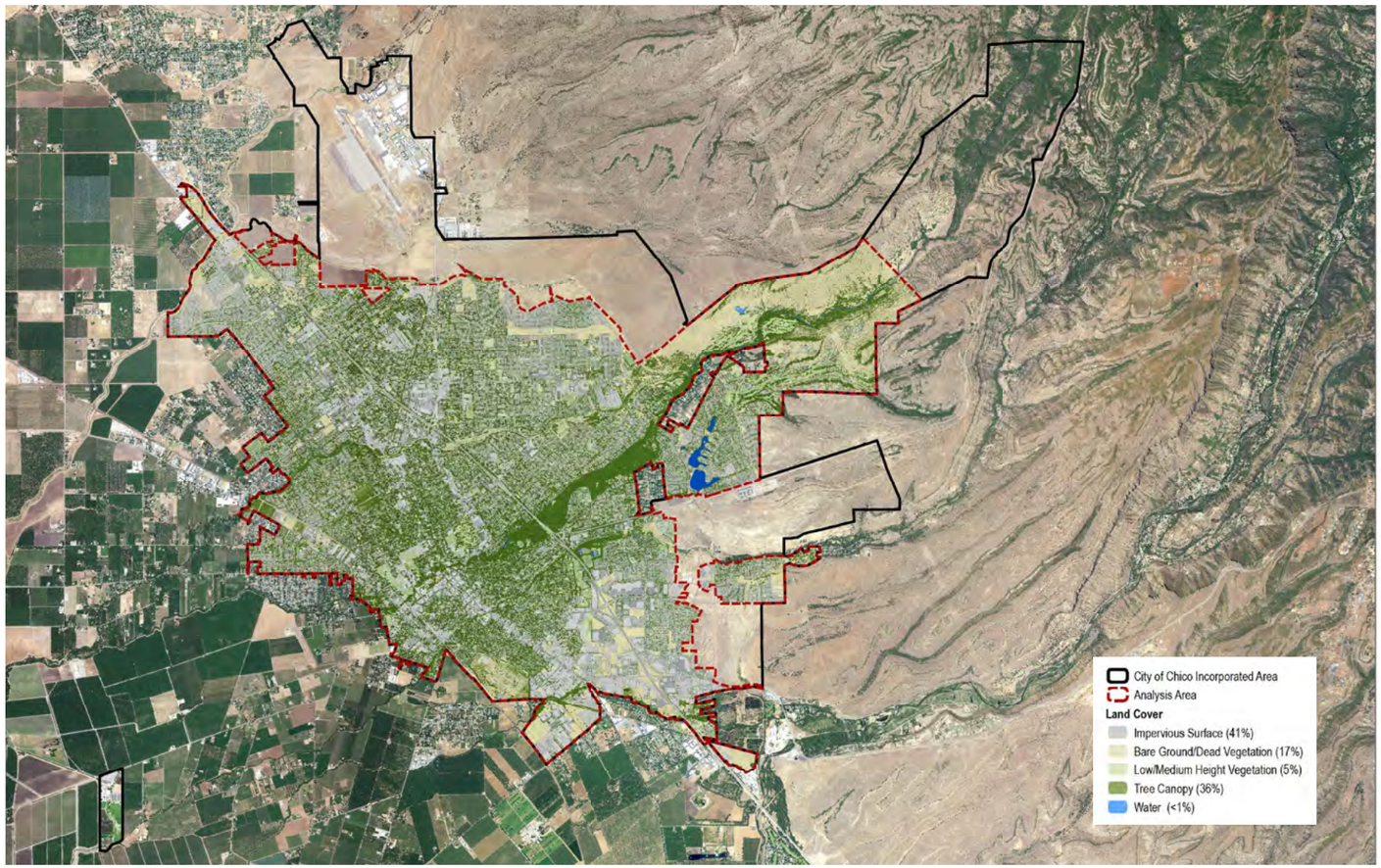


Table 1: Land Covers and Canopy Cover

Land Cover Type	Canopy Cover Assessment			
	Acres (2020)	% Canopy (2020)	Acres (2005)	% Canopy (2005)
Tree	5,357	36%	5,197	35%
Landscape, shrubs, grasses	725	5%	2,052	14%
Impervious surfaces	6,113	41%	4,967	33%
Bare ground	2,580	17%	2,547	17%
Water	58	0.4%	63	0.4%

SPECIES DIVERSITY

Chico's tree inventory consists of 34,874 trees, composed of 120 genera and 321 species. The top 10 genera and species are shown in **Figures 2** and **3**. Sustainability goals are as follows[1]:

Sustainability Goal (Genus): *No genus represents more than 10% of inventory.*

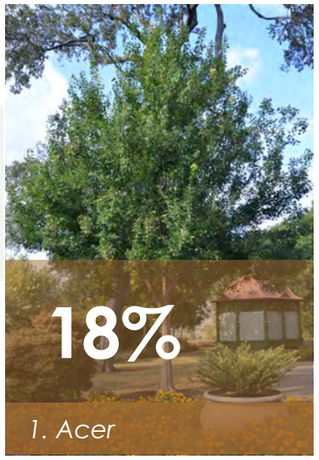
Figure 2.

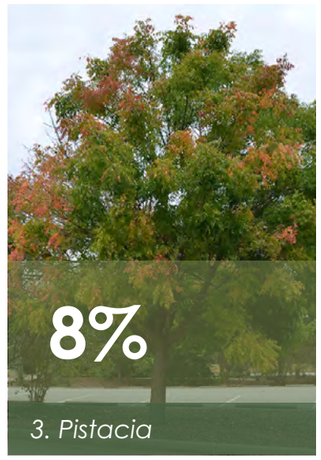
Genus Diversity

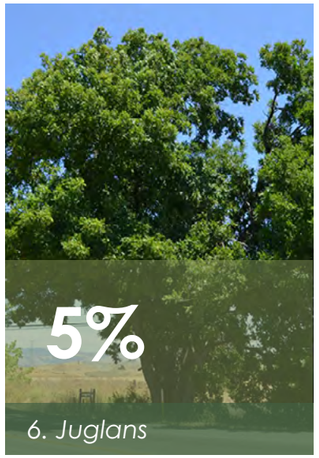
TOP 10 Genera in the City of Chico Tree Inventory

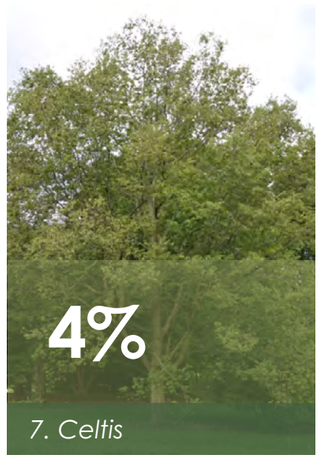
Sustainability Goal: No Genus Greater than 10% of Inventory

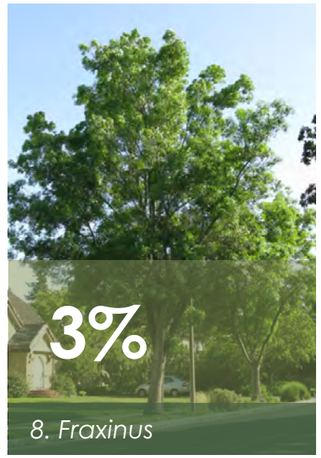
Meets Goal Does Not Meet Goal

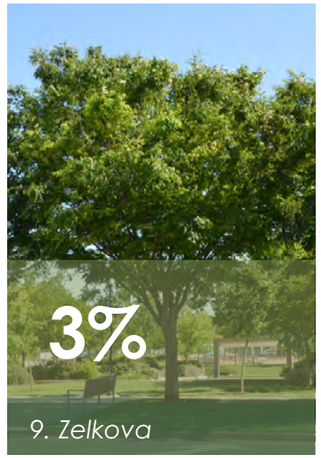












Source: Davey Resource Group 2021.
Note: The sustainability goal is that no genus represents more than 10% of inventory (Barker 1975).

1. Genus and species sustainability goals are based on Barker 1975, "Ordinance Control of Street Trees."

Sustainability Goal (Species):

No species represents more than 5% of inventory

"Remnant native trees in urban forests should be protected for their biodiversity and their cultural value. However, the point that local biodiversity is important gets confused with this idea that we should be using only native plants in our urban forest settings. Native trees are not the only answers for our cities. In many places we have drastically changed the planting environment that native trees often fail, or they are not appropriate...If we decided we were only going to plant native trees it would severely reduce the pallet of diversity available to us."

Matt Ritter, Ph.D.

Professor, Cal Poly San Luis Obispo

Figure 3.

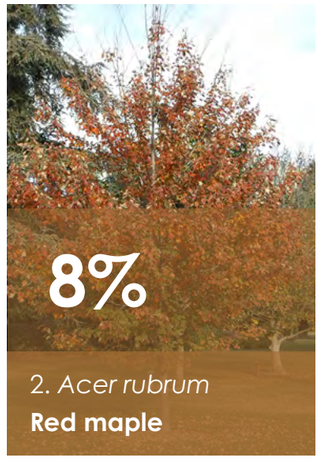
Species Diversity

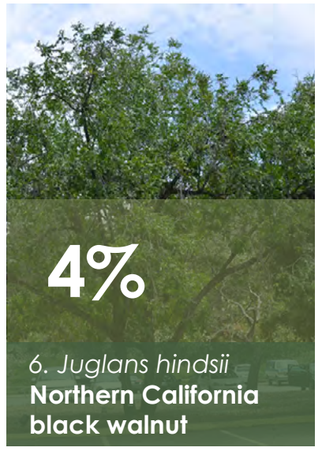
TOP 10 Species in the City of Chico Inventory

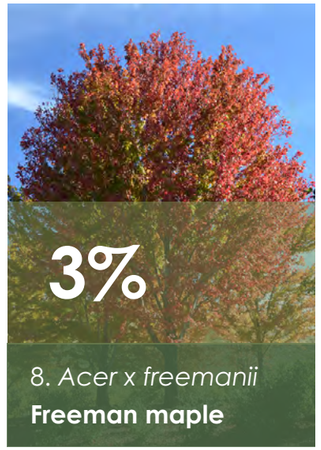
Sustainability Goal: No Species Greater than 5% of Inventory

Meets Goal

Does Not Meet Goal







Source: City of Chico Tree Inventory (Davey Resource Group 2021).
Note: The sustainability goal is that no species represents more than 5% of inventory (Barker 1975).

ENVIRONMENTAL SERVICES AND ECONOMIC BENEFITS

Chico's tree inventory was assessed using i-Tree eco and is determined to provide the environmental services and benefits shown in **Table 2** (see also **Appendix A**, **i-Tree Report**). The financial value of Chico's tree inventory is laid out in **Table 3**.

Table 2. Environmental Services and Benefits

Service	Annual Environmental Benefit	Annual Environmental Impact	Annual Economic Value
Carbon Sequestration	626,000 pounds	The carbon removed from the City's tree inventory is equivalent to the emissions of 226 cars driven per year.	$53,400
Avoided Runoff	12,680 cubic feet	This benefit is the equivalent to the 1.5 times the amount of water the average American home uses in 1 year.	$8,470
Pollution Removal	15,913,000 pounds	The pollution removed by the City's tree inventory is equivalent to the carbon dioxide emissions of 7,977,953 pounds of burned coal.	$10,300

Source: Davey Resource Group 2021.

Table 3. Tree Inventory Value

Value	Description	Asset Amount	Per-Tree Value
		Number of City-Managed Trees	***34,874***
Structural	Tree replacement cost	$139,000,000	$3,985.78
Functional	Value based on the services trees perform	$72,170	$2.07
Carbon Storage (carbon held in tree)	23,450 tons stored	$4,000,000	$114.69

Source: Davey Resource Group 2021.

Figure 4. The Benefit of Trees

The Benefits of TREES

CLEANER AIR
100 trees remove 53 tons of carbon dioxide and 430 pounds of other air pollutants per year.

COMBATS CLIMATE CHANGE
By reducing energy demand and absorbing carbon dioxide, trees and vegetation decrease the production and negative effects of air pollution and greenhouse gas emissions.

CAPTURES RAINWATER
100 mature trees can capture and store about 139,000 gallons of rainwater per year.

CLEANER WATER
A medium-sized tree intercepts up to 2,300 gallons of stormwater runoff per year.

CO2 REMOVED *equals* RESILIENT COMMUNITIES

COOLER SURFACE *equals* SUSTAINABLE LIVING

SAVING WATER *equals* CLIMATE ADAPTATION

ECONOMIC VALUE *equals* JOBS

SAVES ENERGY
Strategically placed shade trees can help save up to 56% on annual air-conditioning costs for homes and businesses.

REDUCES URBAN HEAT ISLAND EFFECT
Shaded surfaces may be 20–45°F cooler than the peak temperatures of unshaded areas.

INCREASES BUSINESS
Shoppers will spend 9% to 12% more for goods and services in business districts with a high quality tree canopy.

GREEN ECONOMY
In 2009, urban forestry supported 60,067 jobs in California resulting in $3.3 billion individual income.

IMPROVES PUBLIC HEALTH
People are less likely to be hospitalized for athsma when they live in neighborhoods with many trees.

IMPROVES MENTAL HEALTH
People living in neighborhoods with less than 10% tree canopy are more likely to report symptoms of depression, stress and anxiety.

URBAN FOREST MANAGEMENT

Staff

The City uses a combination of in-house staff and external contractor services to maintain and manage the City's urban forest. The total number of Full Time Equivalents (FTEs) involved with tree management for Chico is 10.05 (**Table 4**), which is lower than the average number of FTEs (11.8) for urban forest programs of cities with comparable population sizes (Hauer and Peterson 2016a).

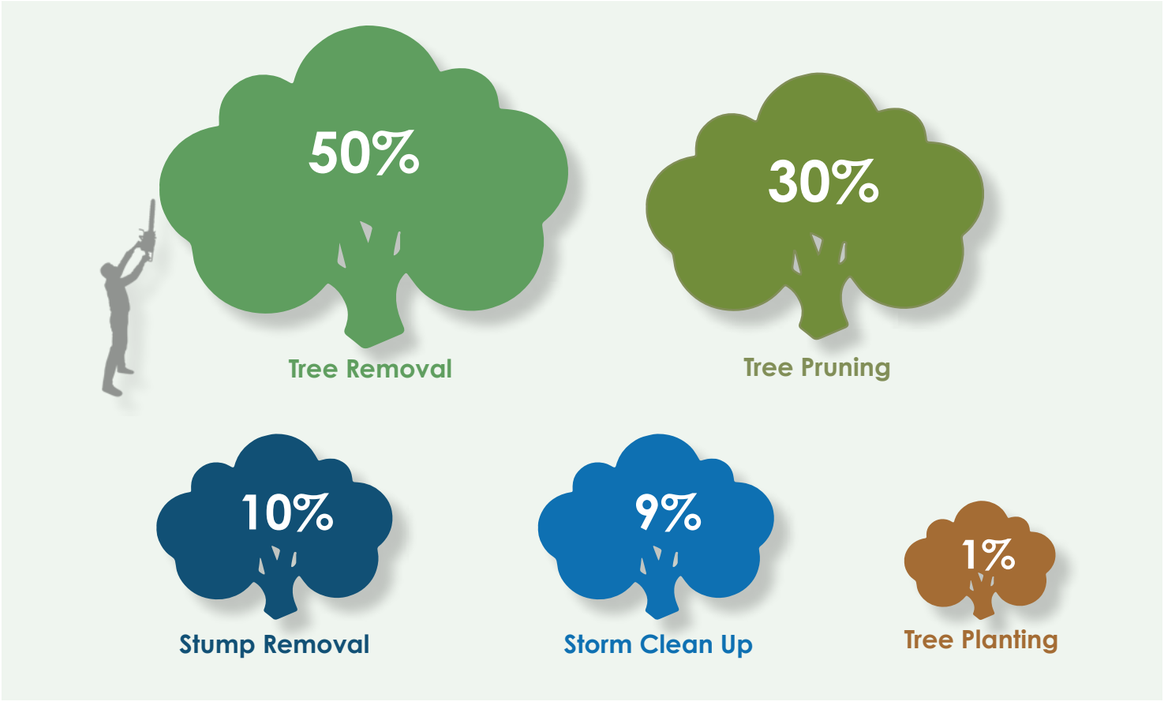
In addition to City staff positions, the City holds contracts with private tree-care businesses to carry out additional tree management tasks, such as planting, pruning, tree and stump removal, and storm cleanup. The relative percentages of tree management work carried out by these contractors are shown in **Exhibit 1.**

Table 4. City of Chico Tree-Related Staff Positions

Type	Number of Positions	Number of FTEs
Management Director/Supervisor	3	2.3
Arborist/Tree Trimmer	5a	5.0
Clerical/Office Support	1	1.0
Seasonal Employee	1	1.0
Internship	1	0.50
Nonprofit	1	0.25
Total	**12**	**10.05**

Notes: FTE = full-time employee.
*A new FTE (maintenance worker) was approved in the 2022/2023 budget approval process.

Exhibit 1. Distribution of Contractor Workload



Budget

The 2020–2021 budget provided to the City's Urban Forest program was $1,443,653 (**Table 5**). The sources of the program budget are presented in **Exhibit 2**. **Table 6** represents a comparison of the Chico urban forest program budget with other municipalities of a similar population and those located in Northern California.

Table 6. Comparison of Municipal Urban Forest Management Funding

California City	Population*	Tree Budget	Number of Publicly Managed Trees	Tree Budget Allocation per Tree
Chico	130,178	$1,443,653	34,874	$41.40
Hauer and Peterson 2016b Survey Respondents (n=78)*	100,00–249,999	$1,368,607	73,723	$44.85
Redding	95,542	$293,111	20,600	$14.23
Temecula	115,202	$571,970	30,715	$18.62
Oxnard	208,154	$374,641	48,806	$7.67
Comparison With Other Northern California Municipal Program				
Willits	4,895	$11,540	425	$27.15
Rancho Cordova	73,147	$329,000	3,910	$84.14
Sacramento	501,334	$6.7 million	100,000	$67.00
San Francisco	874,961	$19 million	236,000	$80.51

Exhibit 2. Chico's Urban Forest Program Funding Sources

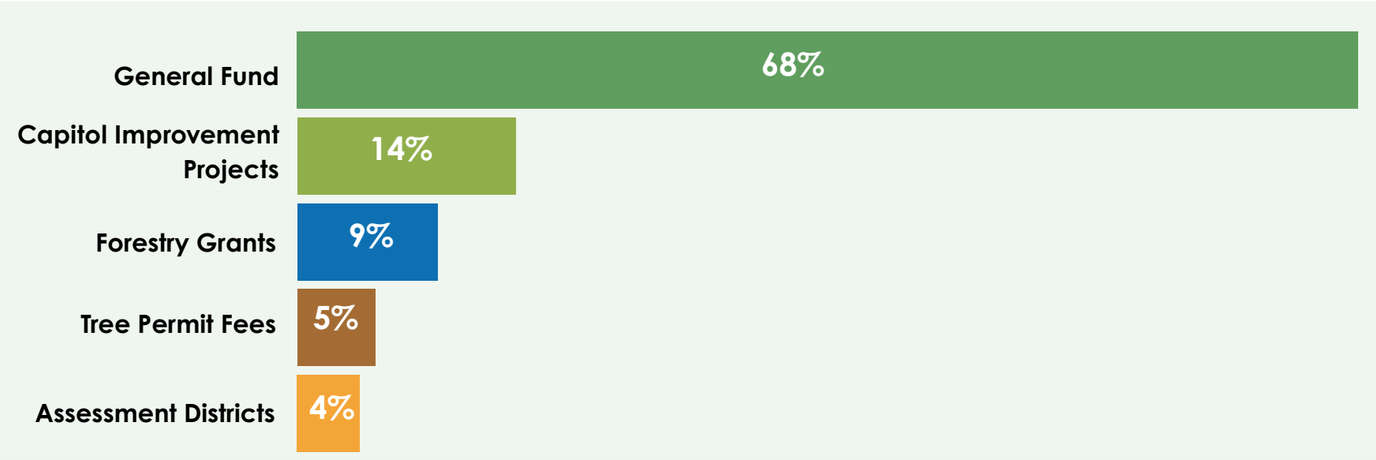


Table 5. 2020–2021 Total Municipality-Funded Tree Care & Management Budget

Tree Management Areas	Budget
Tree Maintenance Funding*	
Street Trees	$1,307,447
Park Trees	$57,500
Public Ground Trees	$57,656
Nursery Tree Maintenance	$450
Corridor Tree Pruning	$20,600
Total	**$1,443,653**
City Staff Salary Funding	
Public Works Director: 0.1 FTE*	$19,707
Manager*: 1 FTE	$95,599
Supervisor*: 1.2 FTE	$159,019
Arborist/Tree Trimmer*: 4 FTE	$343,232
Clerical/Office Support*: 1 FTE	$61,222
Seasonal Employee*: 1 FTE	$48,395
Internship: 0.5 FTE	$6375
Nonprofit: 0.5 FTE	$17,829
Total	**$751,380**
Contractor Services	
Tree Pruning	$80,172
Tree Removal	$133,621
Stump Removal	$26,000
Storm Cleanup	$25,000
Tree Planting	$2,448
Total	**$267,241**
Total Urban Forest Program Funding	
Total	**$1,443,653**
Per-Tree Spending	**$41.40**

Notes: FTE = full-time employee.
* City staff salary breakdown is Included in tree maintenance funding.

Annual Service Data

Annual service data relating to tree maintenance and assessment are depicted in **Figure 5**.

Figure 5.

KEY FINDINGS

Trees and Canopy Cover are a Valued City Asset:

The City of Chico has a high level of canopy cover at 36%, and benefits from being developed in an area that historically consisted of dense riparian and oak woodland vegetation communities. City founders and leaders recognized the value of the natural environment and trees from the beginning stages of City development, and that value continues today with elected officials, City staff, and community members. This is reflected in survey data collected for this UFMP that shows 97% of respondents indicated trees contribute to their quality of life, and 92% view trees as more or equally important to other City-maintained infrastructure. The value and pride for its urban forest is further reflected in the Chico motto as a "City of Trees".

Photo by Sigmund Sleminski

Progressing Towards Equitable Distribution of Canopy Cover:

Often canopy cover in a city is an unequally distributed, with disadvantaged and vulnerable communities experiencing lower levels of canopy cover in comparison to more advantaged areas of the city. While this is true in some areas of Chico, overall canopy cover is relatively equally distributed amongst all neighborhoods. Six of the seven council districts experience canopy cover above 32%, with Council District 6 having 28% canopy cover, which is largely accounted for in a portion of the district that is designated for commercial buildings and shopping centers.

Council District	Canopy Cover Assessment – % Canopy (2020)
District 1	35%
District 2	36%
District 3	32%
District 4	51%
District 5	44%
District 6	28%
District 7	39%

New Development Must Properly Plan for Trees:

New residential housing developments are an essential need to support the growth of Chico and present an opportunity to expand canopy cover. A canopy cover change analysis was conducted using aerial imagery from 2005 and 2020. The analysis identified the largest gains and loss of canopy cover resulted from new residential housing developments. The Northwest Chico neighborhood experienced a 14.39% decrease in canopy cover as a new residential was built over an area that comprised of an orchard. Conversely, the Foothill Park neighborhood experienced a 10.74% increase in canopy cover, which can be contributed to the trees planted in an area that was largely grass and shrub land. This analysis indicates the importance of City planners to develop strategies and guidance for new residential home builders to preserve trees when possible and ensure neighborhood plans incorporate trees in a manner that will help achieve a high level of canopy cover.


Photo by Lori Eckhart

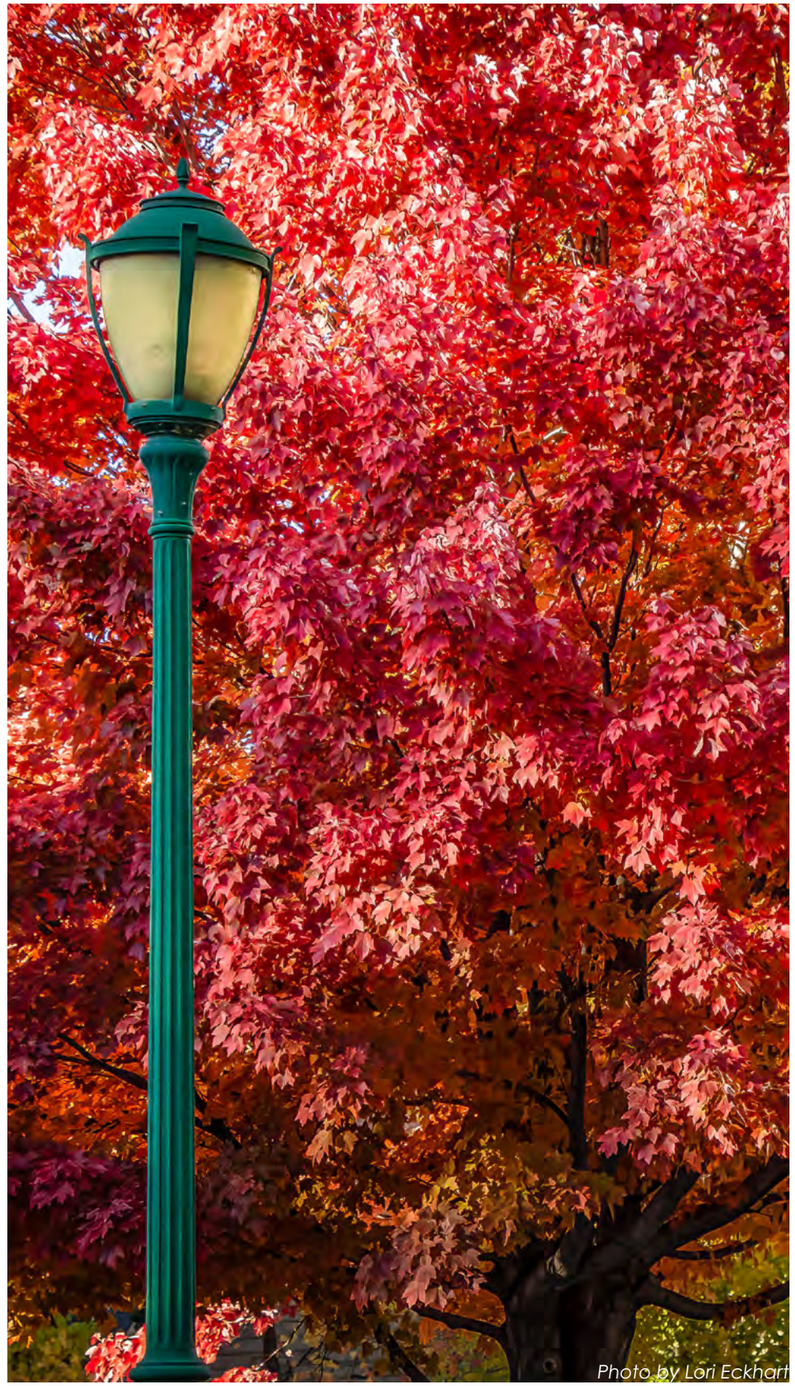


Photo by Lori Eckhart

4 Additional Resources are Needed to Plant, Maintain, and Preserve Trees:

Current funding levels will need to be increased to support urban forest goals and priorities identified during the UFMP process. The City has been successful in receiving grant funding to support planting and maintaining new trees, but this is not a guaranteed line of funding. Actions that are not typically grant funded, like pruning and removing City managed trees, will require additional City funds to achieve goals like increasing the pruning cycle from the current 11 year cycle to a 5-to-7 year cycle. The City must also consider the future management needs of the urban forest that will require steps to sustainably remove declining tree species like the black walnut, and ensure canopy cover is preserved for current and future community members.

5 Prioritize Tree Planting on Commercial Corridors, Retail Centers, and Parking Lots:

As stated, Chico benefits from a high level of city-wide canopy cover at 36%, but it is not equally distributed amongst all land use types. The canopy cover analysis when broken down by parcel type shows an average of 39% canopy cover across all residential home types, including 45% for single family home parcels, 45% for multi-family parcels, and 48% for rural residential properties. Conversely, the canopy cover analysis shows 21% for commercial parcels, 15% for retail parcels, and 10% for industrial parcels. It will be important to continue to plant and water new trees in residential communities to maintain canopy cover, but the greatest opportunity for canopy cover increase exists with non-residential private property. This need was also identified by community members in the online survey data that shows respondents selected parking lots as the second highest priority, and Urban Forest Summit attendees as the highest priority, for where new trees should be planted.

YEAR 1 PRIORITY ACTIONS

Action Item #			Responsible
1	1.a	Develop an urban forest advisory committee consisting of City staff, community members, and other invested stakeholders to ensure a broad range of voices have a say in urban forest practices in Chico.	PW O&M, and all City departments
2	1.b	Identify both communities of place and communities of interest to grow the network of partners, to assist in community engagement and outreach activities	City with collaboration partners from 1.a
3	1.e	In partnership with the Butte Environmental Council, hold quarterly community engagement activities such as tree planting and care events, educational workshops, and free tree give aways.	BEC and partners from 1.a
4	1.f	Collaborate with a local utility company to develop a free residential shade tree giveaway program.	City and participating utilities
5	1.g	Develop an incentive program that offsets the cost to water a newly planted tree over three years, when residential property owners elect to provide establishment care for a newly planted City-managed tree.	PW and partnering entities
6	1.h	Many desirable tree species are not readily available in the nursery trade. Explore the possibility of a city tree nursery in partnership with civic and non-profit groups.	PW O&M, with collaboration partners from 1.a
7	1.o	Explore and integrate the use of smart phone and tablet applications that support GPS for self-guided tours, tree and urban forest information, games and scavenger hunts that facilitate learning.	Climate Action Corps, educational institutions
8	2.i	Continue to develop programs with Chico Unified School District regarding plantings, species selection, maintenance, management of landscapes, and Arbor Day events.	BEC, CUSD, City
9	3.d	Continue analysis of empty planting sites in the right-of-way. Refine list to remove those identified as unavailable.	PW
10	3.f	Select tree species for individual locations that will provide the highest possible canopy cover for the space given the planting area.	PW
11	3.i	Set neighborhood tree canopy goals and measures to increase total canopy tree cover in the City.	PW, GIS
12	4.a	Limit the planting of non-native tree species that represent more than 5% of the City inventory.	PW
13	4.f	Provide resources and educational materials for private property owners on current and emerging threats to trees, such as drought, pests, and diseases, and steps they can take to improve tree health.	PW
14	4.g	Develop a ‘deferred’, ‘preferred’, ‘restricted’, and ‘prohibited’ list of trees for use in the right-of-way.	PW, 1a partners
15	5.b	Review and update the Municipal Code Section 16.66: Tree Preservation Regulations to ensure that defined protected tree regulations apply to all private property trees regardless of qualifications, entitlements, or lot size.	PW, Planning
16	6.b	Annually conduct a level 1 survey of all City-managed trees.	PW O&M
17	7.a	Achieve appropriate funding to meet Goal OS-6 of the General Plan, to ensure a healthy and robust urban forest.	PW O&M
18	7.i	In partnership with other agencies, bring International Society of Arboriculture training opportunities to Chico that will help support the greater arboriculture industry north of Sacramento.	PW O&M, CARD
19	7.q	Develop a Pest Vulnerability Matrix.	PW, UCANR

URBAN FOREST MASTER PLAN

HISTORICAL AND ENVIRONMENTAL CONTEXT

Prior to the founding of the City of Chico in 1860, the original inhabitants of the area were the Mechoopda Indians, a federally recognized tribe who were intrinsically connected to the land for centuries (Mechoopda Indian Tribe of Chico 2022). The rich riparian woodland habitat of the area was used by the Mechoopda and provided a myriad of resources, such as fresh water, shade, and staple food sources like salmon, acorns, waterfowl, and deer (White 2015). The Mechoopda were exceptional stewards of the land, strengthening the production and preservation of natural resources by routine selective burning and cultivating natural stands of flora for food and fiber (BCCER 2021).

In 1860, the City of Chico was founded by General John Bidwell and it was incorporated in 1872. Bidwell's vision and foresight led to the development of a thriving community that incorporated street trees and landscapes throughout the downtown area, in parks and along residential streets. As the town developed, some of the orchards planted by the Bidwell's became street trees, especially in the Avenues. These trees provide an important source of shade and beauty to the City. Most of Chico was initially developed under county jurisdiction and subsequently annexed. This has resulted in a patchwork of substandard rural improvements throughout the urban fabric. It has other planning ramifications such as a wide array of parkway widths and some neighborhoods that were developed in the 1950s having street trees behind the sidewalk. The urban forest is made up of trees, landscapes, and related vegetation within the City's parks, along the streets and creeks, and within private property. Chico's urban forest provides a defining characteristic to the City of Chico that includes environmental services and economic benefits to its citizens.

The elements of the urban forest exist throughout the community, although their care is under several jurisdictions. The first street tree ordinance was codified in March of 1897, delegating the responsibility for oversight to the Committee on Streets, Public Squares and Parks, and delegating the responsibility for maintenance to the abutting property owner. In April 1918, the Bidwell Park and Playground Commission (BPPC) first met in its role as the City's Tree Commission. Today the BPPC has authority over street trees and "shrubberies" provided through the Chico Municipal Code 14.40.

Chico is known as the "City of Trees" and is the most populous city in Butte County, with 102,000 residents. The residents of Chico take pride in maintaining a unique sense of small-town living, a safe environment, a thriving business community, and access to outdoor recreation.

Meriam Library. California State University, Chico.

UFMP DEVELOPMENT PROCESS

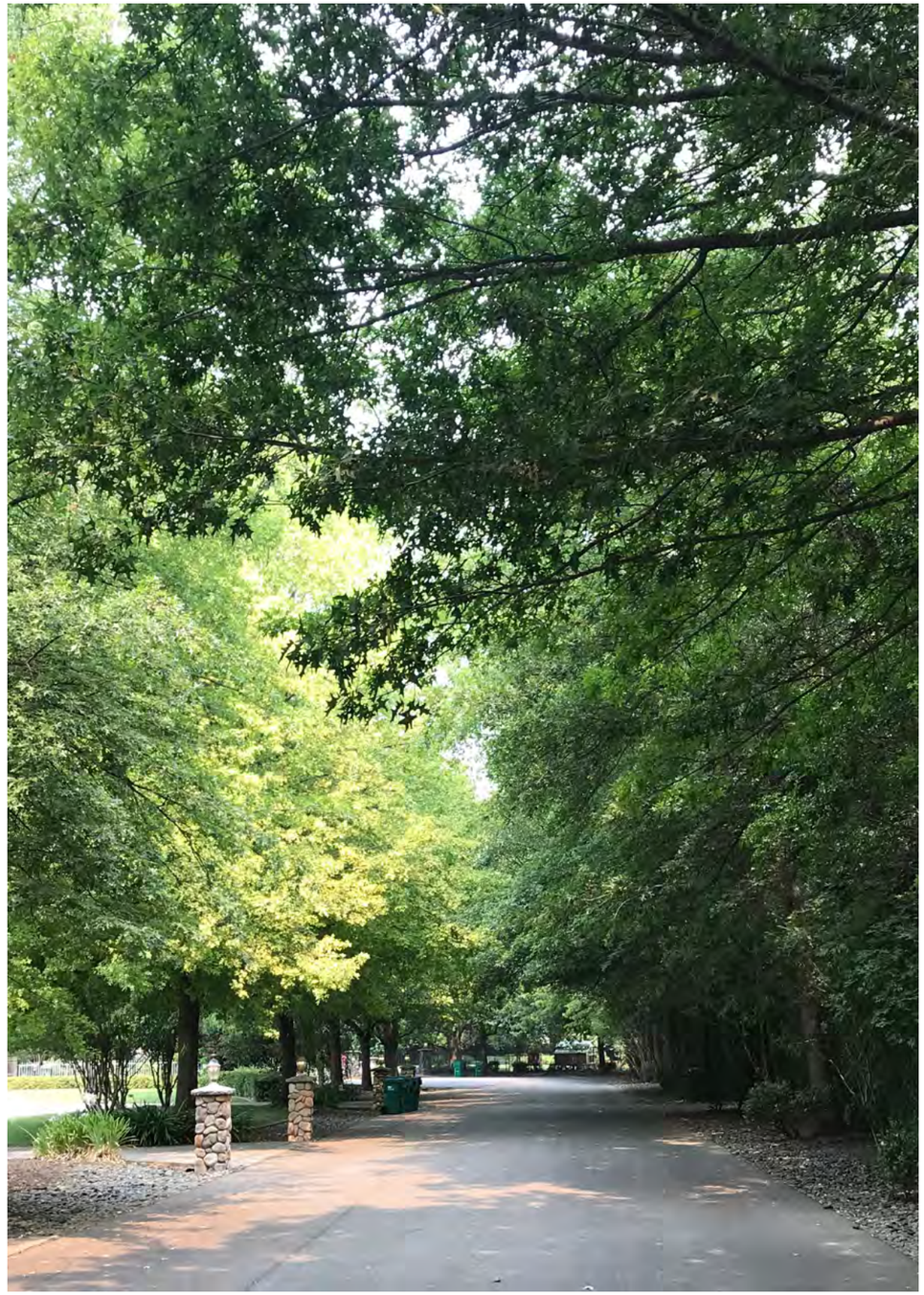
In 2017, the City of Chico was awarded $425,811 from the California Department of Forestry and Fire Protection (CAL FIRE) Urban and Community Forestry Program for its grant application "City of Chico Urban Forest Revitalization". The funding supported updating the City's tree inventory, planting and maintaining 700 trees in disadvantaged communities in collaboration with Butte Environmental Council (BEC), and completion of an Urban Forest Master Plan (UFMP). The City's Urban Forest Manager and Public Works Department are the main City entities that are responsible for overseeing the UFMP's development and implementation, and provided key insights into City practices, coordination with internal and external stakeholders, and co-hosted community engagement events. The Urban Forest Manager provided City standard documents and other data sets for analysis. The following sections detail the analysis, community engagement activities, and processes involved in developing the UFMP.

Analysis of Plans, Policies, and Ordinances

In May 2021, the City began the process of developing the UFMP, in collaboration with BEC and Dudek. The project initiated with a thorough analysis of City management practices, policies, ordinances, and funding, to understand the strengths and deficiencies of its urban forest program. The analysis of current practices was initially informed by reviewing City planning documents, including the Bidwell Park Master Management Plan Update, Chico 2030 General Plan, Stormwater Resource Plan, Climate Action Plan, City of Chico Design Guidelines Manual, The Avenues Neighborhood Plan, and specific plans. It also included an analysis and/or review of City planning practices, tree ordinances, standard details, annual service data, urban forest program budget, and the 2012 draft UFMP which was not finalized or adopted.

Inventory and Canopy Cover Analysis

Using data from the City's 2021 inventory, the consultant team analyzed the information using sustainability metrics to determine the inventory's species diversity, age distribution, condition, relative performance index, environmental services, and economic benefits. This analysis informed what management practices will need to be improved to have the most meaningful impact on tree health and safety in the City.



Additionally, the City's entire urban forest (public and private property) was analyzed to determine the canopy cover extent, and the condition of trees using sustainability metrics. The City canopy cover and land use was derived from National Agriculture Imaging Program (NAIP) imagery, tree height information purchased from Nearmap, LiDAR, and other satellite spatial imagery by using an artificial intelligence learning model to classify and distinguish trees, other vegetation (e.g., shrubs, grasses), water, impervious surfaces (e.g., buildings, roads, and other infrastructure), and bare ground. The information was used to determine an overall canopy cover for the entire City, as well as a change detection to see how canopy cover has changed between over a 16-year period from 2005 and 2021.

Stakeholder Interviews

Understanding the effectiveness of the urban forest management program was further informed by interviews with City staff, elected officials, and external stakeholders. The interviews explored the role each stakeholder had in influencing City tree management, clarified internal City procedures, and informed areas where the City could improve management of the urban forest. The list of City Departments and stakeholders who participated in the UFMP interview process included the following:

PUBLIC WORKS DEPARTMENT OPERATIONS AND MAINTENANCE

Urban Forestry

Facilities Maintenance

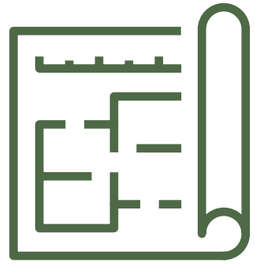
Landscapes

Parks and Natural Resources

PUBLIC WORKS DEPARTMENT ENGINEERING

Traffic Engineering

Construction Inspection



COMMUNITY DEVELOPMENT DEPARTMENT

Building

Planning

Housing

Code Enforcement

Community Engagement

The community engagement process was based on the International Association of Public Participation to ensure those affected by City tree management have a voice in how City trees are managed. The engagement process was guided by these principles:

Inform: To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, and/or solutions.

Consult: To obtain public feedback on analysis, alternatives, and/or decisions.

Involve: To work directly with the public throughout the process to verify that public concerns and aspirations are consistently understood and considered.

Collaborate: To partner with the public in each aspect of the decision, including the development of alternatives and the identification of the preferred solution.

Empower: To place final decision making in the hands of the public.

Input from Chico community members and stakeholders helped to inform the analysis of City management practices and the development of guiding principles, goals, and objectives of the UFMP. The following engagement activities were executed:

- Urban Forest Summit 1 (59 attendees)
- Urban Forest Summit 2 (17 attendees)
- Online survey (310 responses)
- Door knocking campaign (107 responses)
- Community tabling events
- Farmer's market (7 events)
- Chico Pride Festival 2021 (1 event)
- Chico Summer Fest (1 event)
- Co-Op Tabling (4 events)
- BEC Community Forums (3 events)
- Environmental Community Gathering (1 event)
- Endangered Earth Event (1 event)

URBAN FOREST SUSTAINABILITY

Canopy Equity

Achieving an equitable canopy cover is a challenge for most cities. Of the many benefits and services provided by the tree canopy, residents who live in areas with greater canopy cover receive more direct benefits from the surrounding trees than those who live in areas with lower canopy cover. Areas with low canopy cover are more susceptible to pollution, extreme heat, and associated potential health issues (Wolf 2020). As such, creating an equitably distributed canopy can help to create more equitable communities, where residents receive the same quality of life improvements provided by Chico's trees. Even with a dense tree canopy, some portions of Chico experience lower canopy cover, many of which coincide with areas of urban heat islands and increased vulnerability to pollution.

Figure 6 depicts urban heat islands in Chico overlaid with canopy cover, and **Figure 7**on the following page depicts the CalEnviroScreen results for the City. The urban heat island effect occurs when urban areas experience higher temperatures relative to surrounding non-urban areas. Shade provided by robust tree canopy can help to reduce urban heat islands. CalEnviroScreen is an online mapping tool created by the Environmental Protection Agency that identifies pollution burden and vulnerability to the health effects of pollution in California communities (OEHHA 2018). The data is presented as percentages that are mapped by census tract on a scale where 1%–10% are the least vulnerable and 90%–100% are the most vulnerable to pollution.

Census tracts with the greatest area of urban heat islands include tracts 6007000103 and 6007000401, which have a canopy cover percentage of 21% and 17%, respectively, and are among the census tracts with the lowest canopy cover in the City (see **Table 7**). However, these census tracts also have CalEnviroScreen scores of 10%–20% and 20%–30%, respectively, indicating that they are not highly vulnerable to pollution. These census tracts contain relatively new residential development and bare ground areas poised for development. Trees should be included as development occurs to help control urban heat.

Table 7. Census Tracts with High Concentrations of Urban Heat Islands

Census Tract	CalEnviroScreen Score	Canopy Percentage
6007000102	20%–30%	34%
6007000103	10%–20%	21%
6007000104	20%–30%	36%
6007000300	40%–50%	31%
6007000201	20%–30%	39%
6007000202	40%–50%	38%
6007000401	20%–30%	17%
6007000402	10%–20%	39%

Figure 6. UHI and Canopy Cover

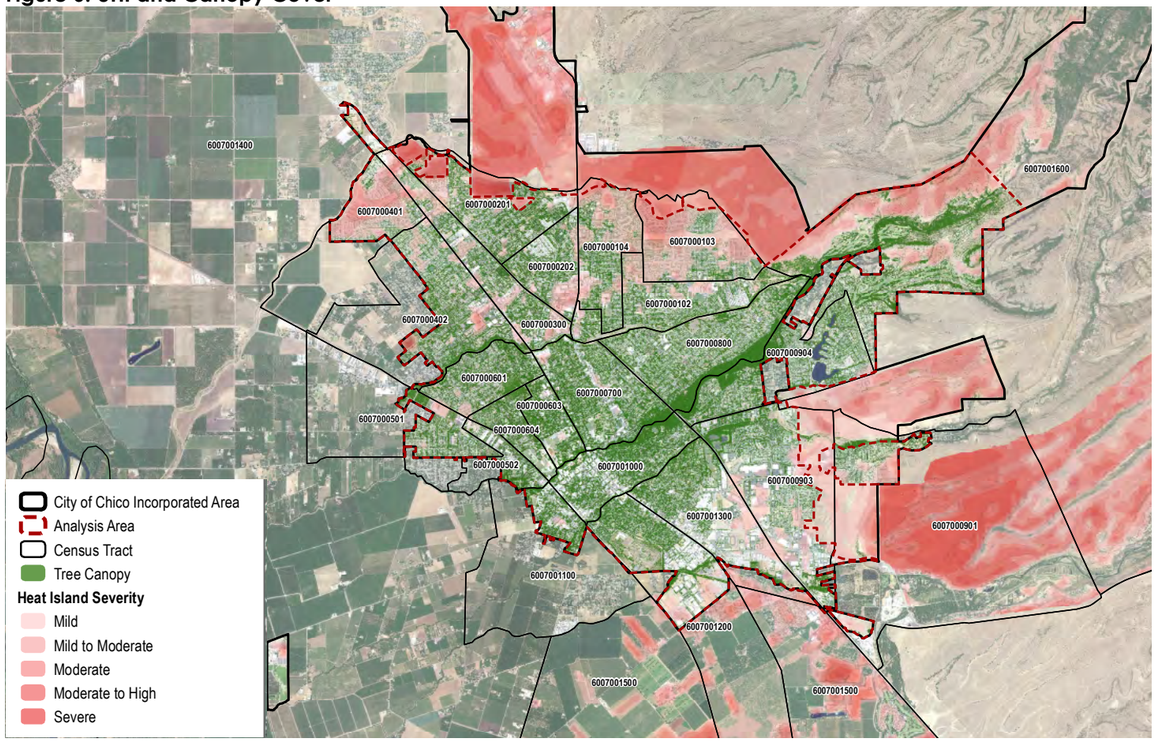
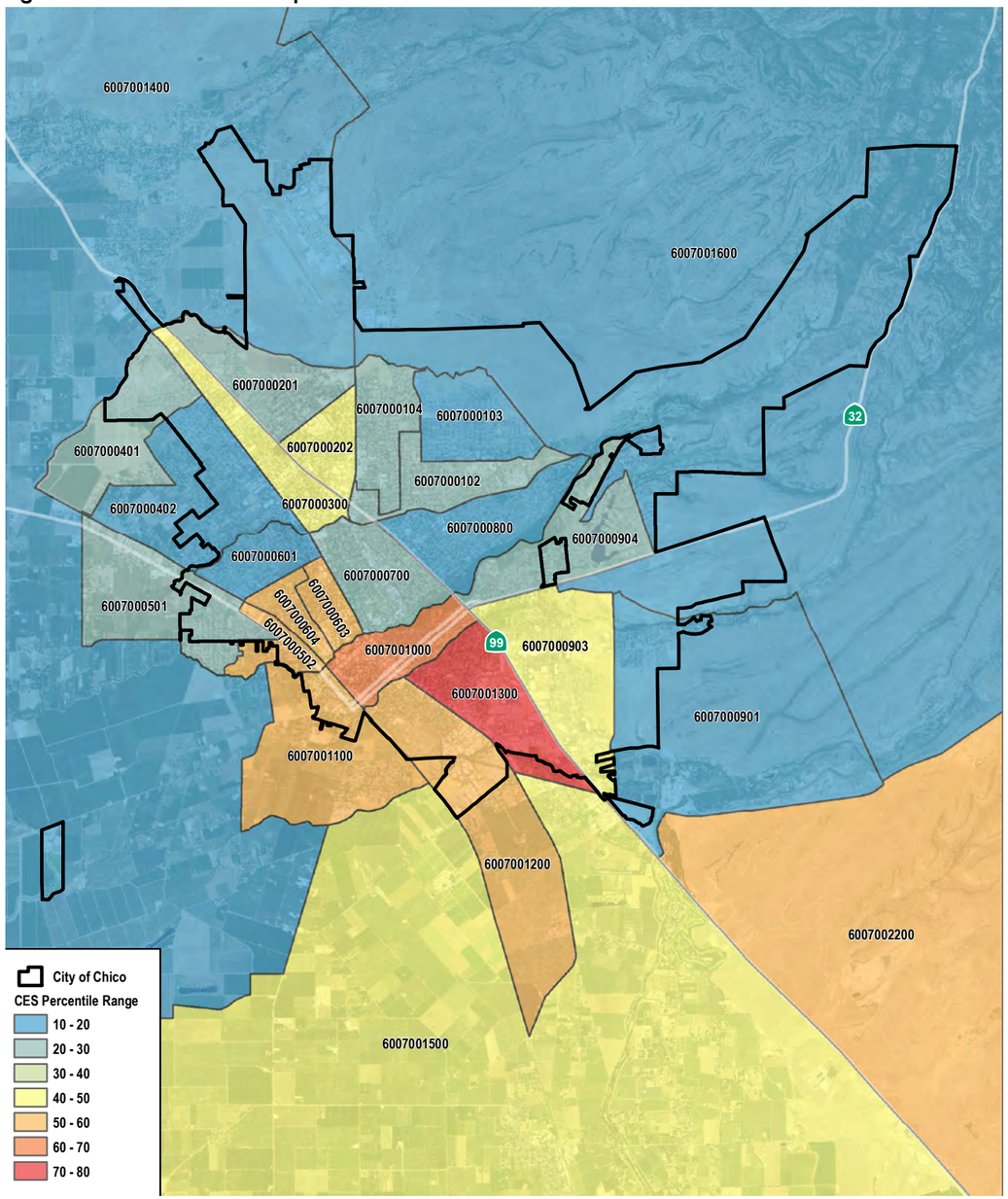


Figure 7. CalEnviroScreen Map



INCREASING CANOPY COVER

Achieving a 40% canopy cover over the next 40 years is a realistic and achievable goal for Chico. **Table 8** depicts the number of trees of varying canopy sizes that would need to be planted to increase canopy to a given percentage. As shown below, the City would need to plant 4,800 20-foot canopy trees, 1,567 35-foot canopy trees, 768 50-foot canopy trees, or 341 75-foot canopy trees per year over the next 40 years to achieve a 40% canopy cover. In reality, it is anticipated that planting 20,000 trees on both public and private property, with a combination of tree sizes, would be required to achieve a 40% canopy cover. Achieving 40% canopy cover over the next 40 years is a realistic and achievable goal for Chico, and is supported by soil conditions that contribute to tree health and longevity (Appendix F).

Annual planting goals should be adjusted each year based on progress made in the previous year. As such, the 5 year milestones shown in **Table 9** can be used to help the City monitor progress.

Table 8. Number of Trees Needed Per Year to Increase Canopy Cover

Total Canopy Cover	20-Foot-Diameter Canopy	35-Foot-Diameter Canopy	50-Foot-Diameter Canopy	75-Foot-Diameter Canopy
37%	1,018	332	163	72
38%	1,559	509	249	111
39%	2,099	685	336	149
40%	4,800	1,567	768	341
45%	7,501	2,448	1,200	533
50%	10,203	3,330	1,632	725

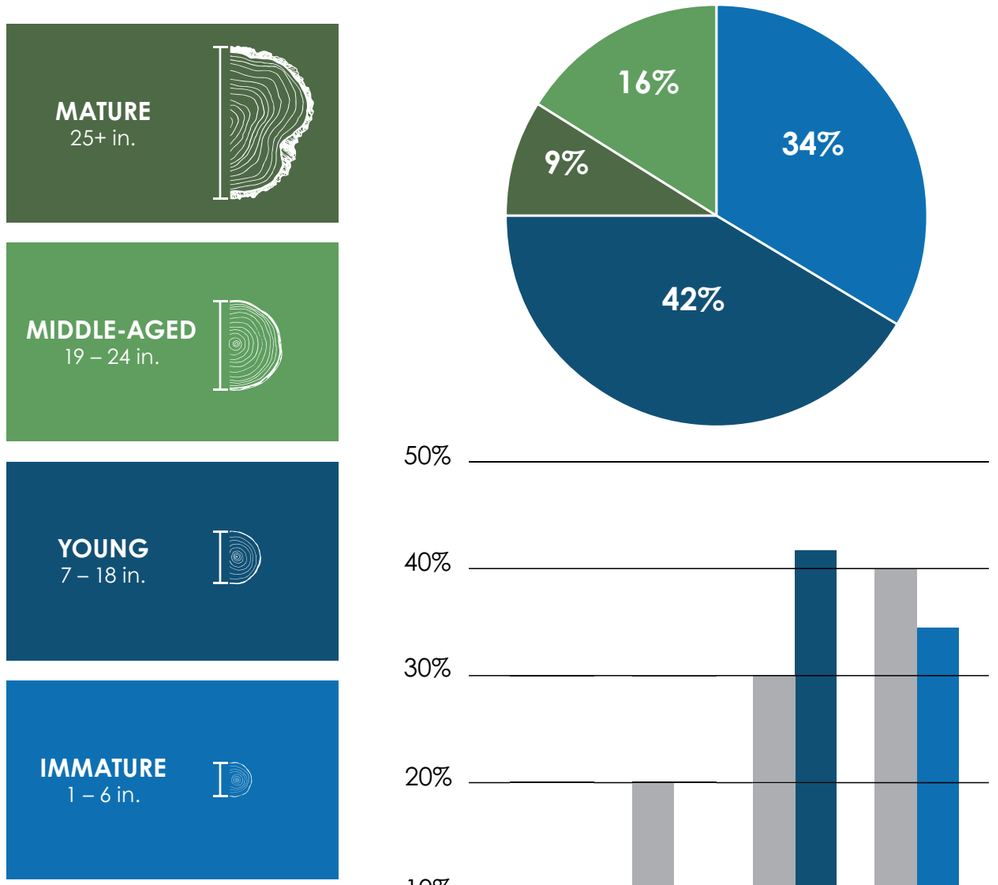
Table 9. Total Trees Planted Every 5 Years

Total Canopy Cover	20-Foot-Diameter Canopy	35-Foot-Diameter Canopy	50-Foot-Diameter Canopy	75-Foot-Diameter Canopy
40%	24,000	7,834	3,839	1,706

DHS Distribution

Figure 8 below presents a summary of data showing recommended distribution of trees by DSH.

Figure 8. Age Distribution of the Chico Tree Inventory



Source: Davey Resource Group 2021.
Notes: Recommended percentages are based on Morgenroth et al. 2020 and Richards 1983.

Tree Condition & Relative Performance Index

The tree conditions represented in Chico's tree inventory are shown in **Table 10**. The relative performance index (RPI) identifies which species are doing well and which may be underperforming. Trees with an RPI of 1 or higher are performing as well or better than the entire inventory.

Table 10. Tree Condition & Relative Performance

Condition	Number of Trees	Percentage
Very good	267	1%
Good	18,678	54%
Fair	13,068	37%
Poor	2,454	7%
Critical	192	1%
Dead	197	1%
Total	**34,856**	**100%**

Source: Davey Resource Group 2021.

The relative performance index of the top 10 species in Chico's Inventory are shown in **Table 11**. The performance goal is as follows:

Table 11. Relative Performance Index

Rank	Botanical Name	Common Name	RPI
1	Pistacia chinensis	Chinese pistache	1.20
2	Quercus lobata	valley oak	0.72
3	Acer rubrum	red maple	1.18
4	Lagerstroemia spp.	crape myrtle	1.26
5	Platanus × hispanica	London plane	0.87
6	Juglans hindsii	Northern California black walnut	0.04
7	Acer platanoides	Norway maple	0.94
8	Acer × freemanii	Freeman maple	1.40
9	Zelkova serrata	Japanese zelkova	1.05
10	Celtis sinensis	Chinese hackberry	0.95
		City Inventory Total*	**0.55**

Source: Davey Resource Group 2021. **Notes:** RPI = relative performance index. The RPI is based on data from the U.S. Forest Service Center for Urban Forest Research. *Total is not additive.

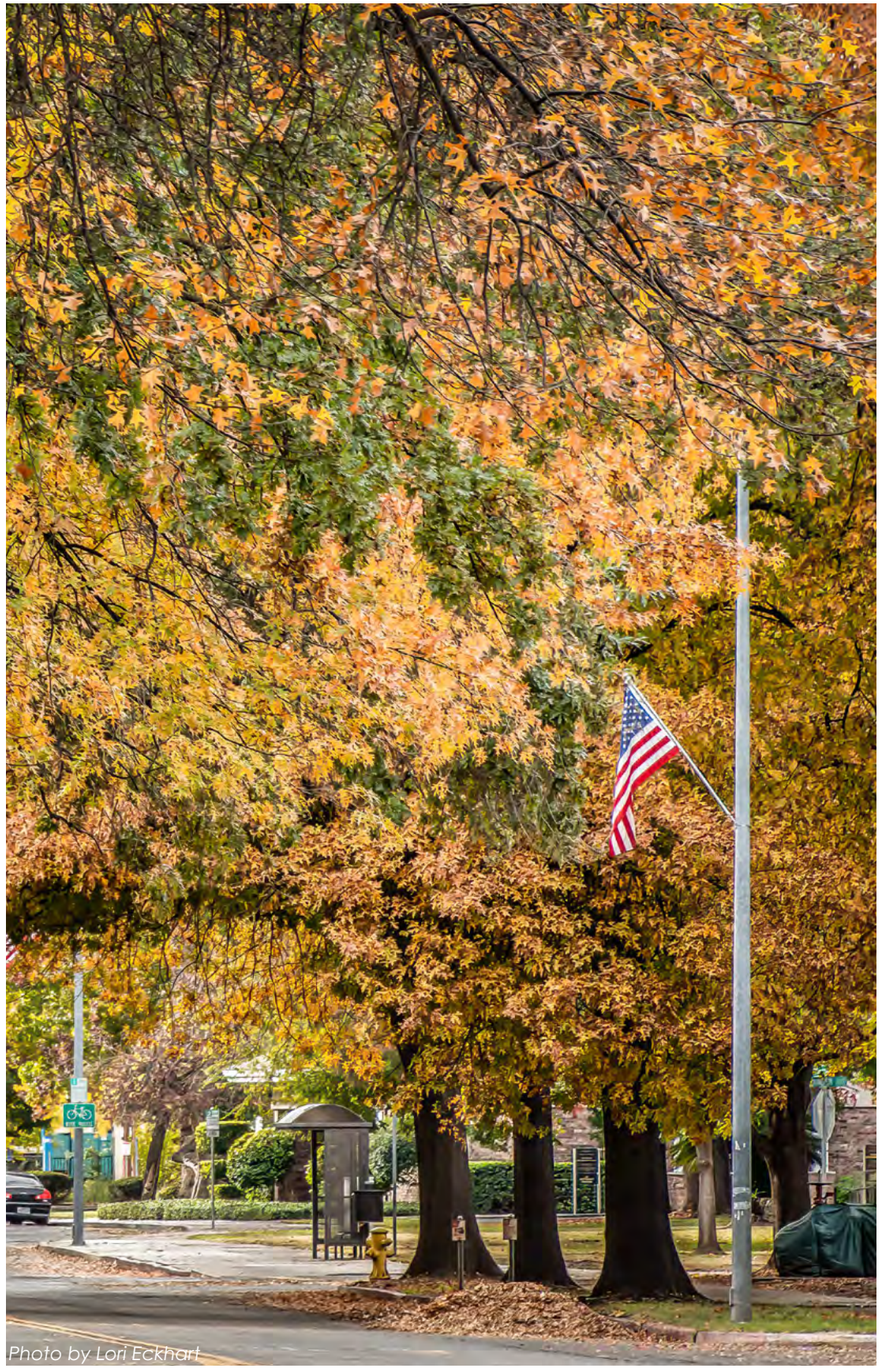


Photo by Lori Eckhart

COMMUNITY ENGAGEMENT

Public Survey

An online survey in English and Spanish was created to identify the public's perception and understanding of the City's trees, and to offer a space for public feedback as the City developed its UFMP. The 29-question survey was open between June 14, 2021, and April 20, 2022, and was distributed through various City social media outlets, local newspapers, door to door canvassing, farmers markets, the Urban Forest Summit, and communications sent by City staff and BEC. In total, 316 survey responses were recorded. A summary of themes is included in **Table 12**.

Table 12. Summary of Public Survey & Responses

Topic	Responses
Communication and marketing of the Urban Forest program	• 21% knew of the City's tree care activities, and learned about them through various media outlets • 16% had visited the City's website to get more information on tree care • 53% learned about the survey on social media or from an email
Views of trees as a City asset	• 72% view trees as equally important as other City-maintained infrastructure • 97% believe the trees contribute to their quality of life • 75% strongly agreed or agreed that residents should be encouraged to increase number of trees on their property
Threats facing trees in Chico	• 31% view drought as the most important threat facing trees in Chico • 32% view water use and risk of falling branches as the top two concerns of respondents to growing trees on their property
Trees on public property	• 68% of responses want to see more trees planted in parks and open spaces, and parking lots • 63% selected growing needs, water needs, and suitability to Chico's climate as the most important factors to consider when selecting a tree to plant
Opinions on tree protection ordinances	• 65% were in support of the tree protection ordinance (Chapter 14 of the Municipal Code) • 62% were in support of the tree protection during construction ordinance (Chapter 16 of Municipal Code) • 34% would support a tree protection ordinance that extends to all trees, and 15% would support the ordinance only for trees of a certain size/species. • 14% would oppose extending the tree protection ordinance to existing development
Outreach campaigns to strengthen the urban forest	• Tree species selection and maintenance/care (29%), assistance with maintenance and care costs (27%), healthy trees on private property. • To assist the City with reaching its canopy cover goals, respondents were willing to plant and maintain trees on their property, attend educational workshops, volunteer at community tree plantings, and volunteer to water City-owned trees near their property

Urban Forest Summits

The first Urban Forest Summit was held at the Arc Pavilion on July 31, 2021. The summit introduced community members to the UFMP, provided preliminary inventory and community survey data analysis, and created a venue for community members to voice their opinions and perceptions about the City's urban forest. The summit was attended by 59 individuals, who completed a voluntary demographic survey to help the City understand who attended the event. The success of this model was presented at the International Society of Arboriculture 2021 Virtual Conference. Attendees shared the ideas and opinions shown in **Tables 16 and 17**.

Table 13. Post-It Activity Response Themes

What do you love about Chico's trees?	20-Foot-Diameter Canopy	35-Foot-Diameter Canopy
• Shade and cooling • Habitat for wildlife • Diversity • Beauty • Fall colors • Maturity and size • Environmental and health benefits • Iconic to Chico's history	• More funding • More education for community members • Improved tree maintenance • Collaboration with utility companies • Improved planning and development • Improved maintenance • Increased tree planting in specific locations • Species selection	• More trees in specific areas • Better aligned planning and development • More healthy, larger trees • More native trees • More edible trees • More climate-adapted species

Table 14. Guided Brainstorming Activity Themes

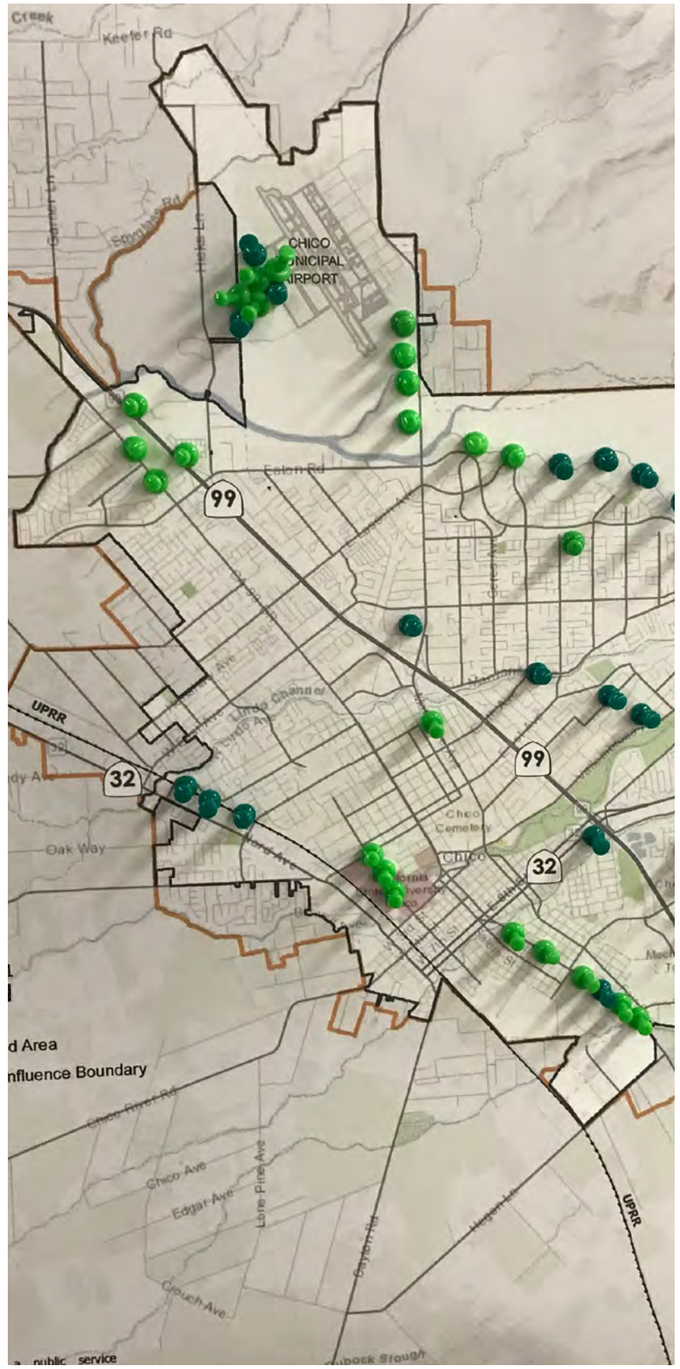
Engage: *How do we get more residents involved in the urban forest?*	Preserve: *How do we help preserve the existing urban forest?*	Grow: *Where/how can we get more trees planted on non-City-owned land?*
• Improved marketing/outreach campaigns • Public education campaigns • Citizen science programs • Focus on climate change	• Protecting existing trees in developed areas • Protecting existing trees in undeveloped space and during construction • Protecting trees in general • Increased education	• Host events and contests to incentivize tree planting • Protect private trees • Improved development and planning • Proper planting and establishment care • Increased education • Appropriate enforcement of ordinances • Plant trees in specific locations

Working Group

The City's UFMP Working Group was formed to bring together City staff, Chico Area Recreation and Park District (CARD) staff, environmental non-profit staff, and community members to help advise the UFMP's development. A list of the Working Group's members and their areas of expertise is included in **Table 15**. Four working group meetings were held between July 2021 and January 2023, and each meeting was facilitated by the consultant team.

Table 15. Chico's Urban Forest Master Plan Working Group Members

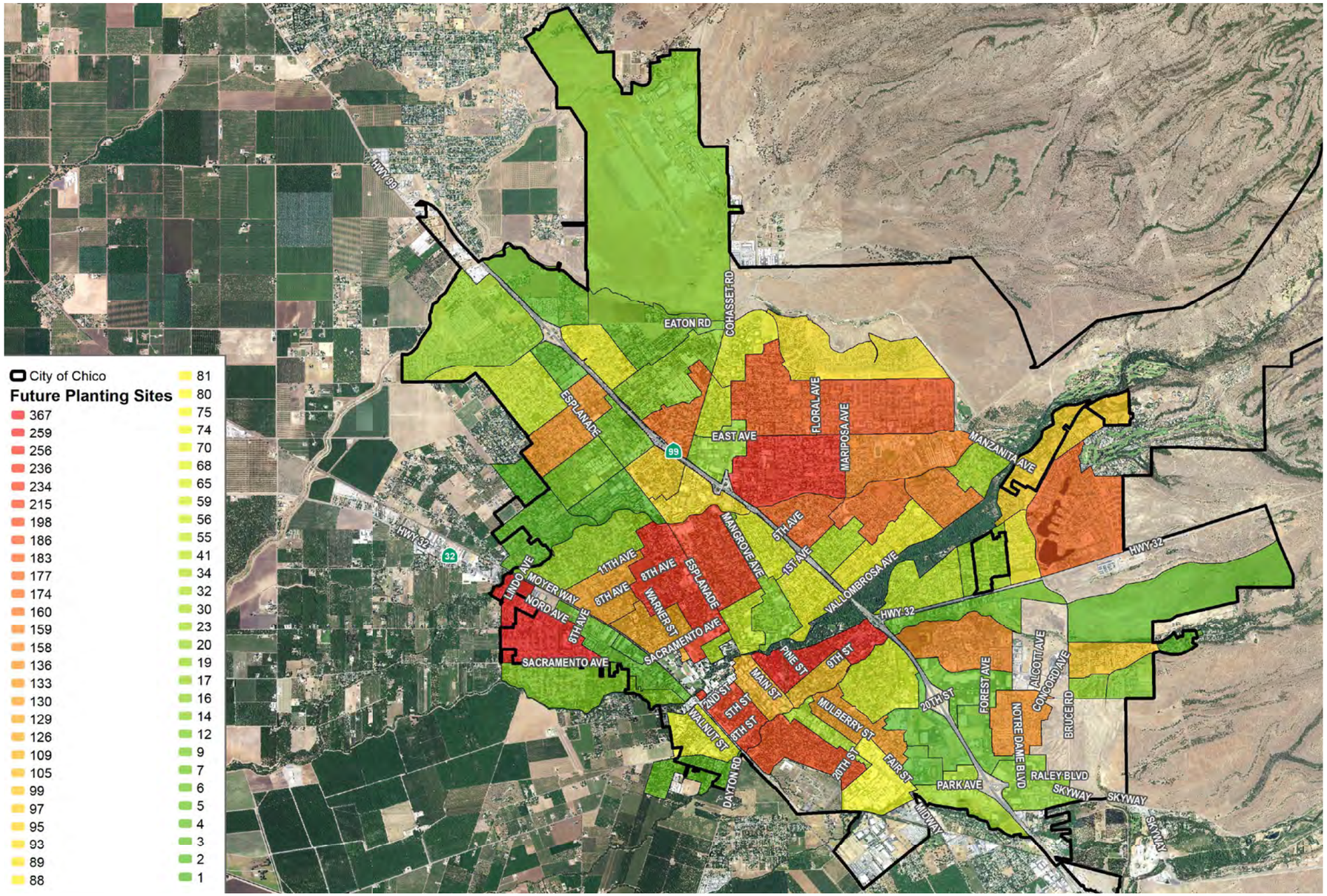
Name	Affiliation	Area of Expertise
Richie Bamlet	City of Chico	Urban forestry
Bill Smith	City of Chico, Registered Professional Forester, former Bidwell Park & Playground Commissioner	Urban forestry
Megan Thomas-Petty	Bidwell Park & Playground Commission, Tree Committee	Urban forestry
Aaron Haar	CARD, Parks Commission, Tree Committee	Parks and recreation, tree maintenance
Robin McCollum	Chico Tree Advocates	Urban forestry
Ken Chase	Chico Landscape Industry	Landscape architecture
Caitlin Dalby	Butte Environmental Council	Environmental non-profit sector, City grant partner
Julia Gowin	CAL FIRE	Urban forestry
Mike Sawley	City of Chico	City planning
Jason Bisho	Chico landscape industry	Landscape architecture
Joe Glacken	CARD	Parks and recreation, tree crew
Garrett Liles	Chico State University Professor	Soil ecology
Luke Pyle	CARD	Parks and recreation, crew foreman



CITY-WIDE PLANTING PLAN

A City-wide tree planting plan was developed to assist the City in determining the number of available street tree planting locations in neighborhoods, and the appropriate species for those locations The available planting locations are derived from the current inventory, broken down by the 99 neighborhoods within the City (see **Figure 9**, Neighborhoods with Future Tree Planting Sites), and includes the type of planting location (parkway, median, front-yard, etc.) and the size of the planting space. The planting plan also includes the top ten species planted within each neighborhood to inform what species could be planted to increase species diversity. Finally, the combination of available locations, planter space, and species diversity is compared against the recommended tree species planting list to narrow down which species would be appropriate for the individual locations. The planting plan is available online at www.chicotrees.org, and an image representing the online map is presented in **Appendix E**.

Figure 9. Neighborhoods with Future Tree Planting Sites



STRATEGIC PLAN

Vision Statement

Our urban forest is a resilient network of trees that is sustainably managed by the city and residents, providing equitable social, economic, and ecosystem benefits to all residents, habitat for wildlife, and reflects Chico's identity and legacy as the City of Trees.

Guiding Principles

The Guiding Principles reflect the overall vision and help to direct the goals and objectives of the UFMP

Table 19. Guiding Principles of the Urban Forestry Master Plan

Guiding Principle	Definition
A Connected Community	All cultures, histories, and perspectives are welcomed and work together to strengthen the urban forest.
The Comfort of Trees	The urban forest protects and enhances the physical, mental, and emotional well-being of Chico community members and provides habitat for wildlife.
Start with Trees	Growth and development in the City will prioritize trees in the planning process and maximize the available space to expand tree canopy cover.
Sustainable Resources	The urban forest program will have the human and financial resources necessary to reach its long-term vision.

Acronym	Definition
BCLFN	Butte County Local Food Network
BEC	Butte Environmental Council
BPPC	Bidwell Park & Playground Commission
BD	Building Division
CalFIRE	California Department of Forestry and Fire Protection
CARD	Chico Area Recreation and Park District
City	City of Chico
Climate Action Corp	California Climate Action Corps
CoC	Chico Chamber of Commerce
CSU	California State University Chico
CUSD	Chico Unified School District
GIS	Geographic Information Systems Division
Master Gardeners	UC Master Gardeners of Butte County
PIO	City of Chico, Public Information Officer
Planning	Planning Division
PW	Public Works Department
PW ENG	Public Works Engineering Department
PW O&M	Public Works Operations and Maintenance Department
UCANR	University of California Agriculture and Natural Resources

GUIDING PRINCIPLE: A CONNECTED COMMUNITY

Goal				
1	By 2028, engage at least 50% of residents through outreach and engagement efforts that is representative of all residential types and demographics within the City of Chico.			
Action Items		**Cost**	**Method of Measurement**	**Who is Responsible**
1.a	Develop an urban forest advisory committee consisting of City staff, community members, and other invested stakeholders to ensure a broad range of voices have a say in urban forest practices in Chico.	$	• Expand on current UFMP Working group.	PW O&M, and all City departments
1.b	Identify both communities of place and communities of interest to grow the network of partners, to assist in community engagement and outreach activities	$	• Contact list created of local non-profits, Community groups, Civic groups, churches, HOAs, property management companies, developers, businesses. • Initial list of 100 contacts created and kept up to date.	City with collaboration partners from 1. a
1.c	Create a chicotrees.org webpage for community input on the Tree Division Urban Forestry, display current urban forest data like canopy cover, tree inventory statistics, current legislation and annual trees planted and removed.	$	• Track web traffic numbers. • Green Industry legislation kept current e.g. AB 1881, SB1383 and others.	City
1.d	Develop a comprehensive education program to enhance community member understanding of tree maintenance practices including planting, establishment care, pruning, costs of deferred maintenance and the importance of continuing to water trees to maintain tree health during drought conditions.	$$	• Work with partners identified in 1a, 1b to develop content. • Effectiveness of programs assessed by survey of attendees. • Frequency of events (target quarterly). • Approaches to encourage tree retention on residential private properties are developed. This is a critical action threshold to achieve no net loss of tree canopy (Action 3.L)	PW O&M, with collaboration partners from 1. a
1.e	In partnership with the Butte Environmental Council and other partners, hold quarterly community engagement activities such as tree planting and care events, educational workshops, and free tree give aways for private property.	$	• Delivers programs developed in 1.d • Number of participants (attendees and training providers). • Number of trees distributed. Target 500 by 2025. • Tracked mortality rate of trees over a three-year period. • Calculate environmental benefits of free trees from i-tree suite.	BEC and partners from 1. a

Action Items		Cost	Method of Measurement	Who is Responsible
1.f	Collaborate with a local utility company to develop a free residential shade tree giveaway program.	$	• Emphasis on drought tolerance, climate adaptation, energy savings. • Promotion of appropriate species to plant under utilities. • Partnership created with water provider to promote turf rebate program for water savings.	City and participating utilities
1.g	Develop an incentive program that offsets the cost to water a newly planted tree over three years, when residential property owners elect to provide establishment care for a newly planted City-managed tree.	$	• Build on 1.d and collaborators in 1.f. • Expand outreach to educate on low cost of young tree establishment compared to other land uses. • Explore partnerships with local business to incentivize tree watering activities.	PW and partnering entities
1.h	Many desirable tree species are not readily available in the nursery trade. Explore the possibility of a city tree nursery in partnership with civic and non-profit groups.	$	• Possible locations identified. • Explore partner sites such as CSU, local nurseries contract grows opportunities. Explore possible school involvement, Master Gardeners and other communities of interest identified in 1. b	PW O&M, with collaboration partners from 1. a
1.i	Develop outreach efforts that manage resident expectations when non-emergency service requests are submitted.	$	• Provide website (1.c) and other social media outreach. • Develop and communicate protocols for response times based on available staffing resources.	PW O&M, PIO
1.j	Promote habitat values of city street trees and how they act as wildlife corridors from larger open spaces.	$	• Collaborate with appropriate partners from 1.b e.g., Audubon Society. • Provide website (1.c) and other social media outreach	PW

Action Items		Cost	Method of Measurement	Who is Responsible
1.k	Support and develop use of the city owned urban forest as a resource for increasing community food resilience and access to locally sourced food.	$	• Seek and apply for funding mechanisms such as grants, donations, and community volunteerism. • Develop partnerships with non-profit, businesses and civic groups. Ref to 1.a, 1.b, 1.e. • Develop MOU's, permits and protocols for BPPC approval. • Develop fruit gleaning and distribution programs of city-owned fruit trees. • Develop a free fruit tree program for residents, schools, and other qualifying entities. • Short-term goal: distribute 300 fruit trees by 2025. Re-assess program	Partners from 1.a, Climate Action Corp, BCLFN, BEC
1.l	Incorporate urban forestry messaging into existing City initiatives.	$	• Notes: Public landscapes and urban forestry impact every aspect of city living. Even when urban greening benefits are secondary to the primary purpose of city-led initiatives, urban forestry messaging should be incorporated into outreach and public engagement activities. • Report outreach activities in annual and monthly BPPC staff reports.	PW O&M, PIO, BPPC
1.m	Develop plans to direct tree planting and maintenance activities to neighborhoods with the highest need.	$	• Set priorities utilizing data from sources such as American Forests Tree Equity scores, CalEnviroscreen and data in this UFMP in conjunction with up-to-date inventory data.	PW O&M, Planning, GIS

Action Items		Cost	Method of Measurement	Who is Responsible
1.n	Develop a demonstration arboretum that highlights trees adapted to projected changes in climate.	$$	• Identify candidate sites on either city-owned property, such as World of Trees or in partnership with other entities such as CSU, Butte College, CARD. • Explore alternative option for non-geographic locations that could host walking tours (see action 1.o). • Select and procure tree specimens. Develop specification plan and install specimens. • Develop print, website, and social media content. • Develop long-term monitoring and reporting plan to determine success and failure of tree species.	PW O&M, PIO, UCANR, CSU, CARD, other partners from 1. a
1.o	Explore and integrate the use of smart phone and tablet applications that support GPS for self-guided tours, tree and urban forest information, games and scavenger hunts that facilitate learning.	$	• Develop interested partners from 1.a, 1.b. Climate Action Corps, educational institutions. • Also use to promote Heritage Tree Program (action 5.g) and demonstration arboretum (1.s)	Climate Action Corps, educational institutions
1.p	Chico attains recognition for promotion of urban forestry standards.	$	• Bidwell Parks and Playground Commission determine which awards staff should prepare to qualify and apply for including Society of Municipal Arborists (SMA) Accreditation. Tree Cities of the World. Tree City Growth Award-Sterling award and Bee City USA.	BPPC, PW O&M, PIO
** $ Low (0-$25,000), $$ Medium ($25,000 -$50,000), $$$ High ($50,000 - $100,000), $$$ Very High (>$100,000)*				

GUIDING PRINCIPLE: THE COMFORT OF TREES

Goal				
2	By 2033 increase canopy cover by 50% across all non-City-managed land use types.			
Action Items		**Cost**	**Method of Measurement**	**Who is Responsible**
2.a	Public outreach during the development of this UFMP indicates that parking lot shade is inadequate. Evaluate the effectiveness of Municipal Code 19.70.60. Identify reasons for success and failure.	$$	• Conduct aerial imagery analysis of parking lots that were installed as part of a discretionary approval permit after the date of the parking lot shade ordinance was enacted. • Report on successes and failures of parking lot landscape. • Follow up with field verification and collect inventory sample data.	Building Division, GIS, CSU, PW O&M, partners from 1. a
2.b	Update Municipal Code 19.70.60 parking lot standards for tree planting that provides adequate space and soil volume to support long-term tree growth and health.	$	• Conduct research to determine successful design strategies to attain 50% parking lot shade. • Update Municipal Code 19.70.60 to require engineering and design standards appropriate for the parameters of the development site.	Building Division, GIS, PW O&M, partners from 1. a
2.c	Enforce Municipal Code 19.70.60, which requires parking lots to be covered with 50% shade by year 15. General Plan Action OS-6.1.1 (Urban Forest Maintenance) "Working with commercial parking lot owners to improve the shade canopy."	$$	• Reach out to selected stakeholders to engage in corrective measures. • Develop long-term maintenance strategies to ensure healthy parking lot tree canopy, for example action 5. p. • Consider alternatives to the common 50% at 15-year standard if it is deemed impractical.	Building Division, GIS, PW O&M, partners from 1. a
2.d	Develop parking lot tree planting standards workshops in collaboration with Building Development.	$$	• Build capacity and acceptance of strategies that attain the goal of adequate parking lot shade.	Building Division, GIS, PW O&M, partners from 1. a

	Action Items	Cost	Method of Measurement	Who is Responsible
2.e	Develop a comprehensive educational program for commercial, retail, and industrial landowners on how trees add economic value to their business or property, City standards, proper tree maintenance practices, and the importance of continuing to water trees to maintain tree health during drought conditions.	$	• Expand on action 1. d	PW O&M, PIO, CoC, water utility provider, BEC
2.f	Enforce tree pruning Best Management Practices (BMPs) on private commercial parking lots that are a requirement of development.	$	• Develop outreach to landscape and tree companies to build capacity.	PW O&M, PIO, CoC, water utility provider, BEC
2.g	Provide resources to Butte Environmental Council to conduct outreach and engagement efforts to businesses along commercial corridors and retail centers.	$$	• Implement programs developed in action 2.e	PW O&M, PIO, CoC, water utility provider, BEC
2.h	Develop an urban forest coalition comprised of other significant local and regional landowners like Chico Area Recreation and Park District, Chico Unified School District, Chico State University, Mechoopda Tribe, Butte County, utility companies, and others to ensure shared urban forest goals and policies.		• Coalition meets once per year. • Report on activities	Build on partners from action 1.a
2.i	Continue to develop programs with Chico Unified School District regarding plantings, species selection, maintenance, management of landscapes, and Arbor Day events.	$	• Every K-12 student experiences at least one Arbor Day event, demonstration, or lesson regarding trees and urban forestry before graduation. • Attain grant funding either for City or non-profit partner to develop educational programs which build in already successful projects.	BEC, CUSD, City
2.j	Encourage citizens to remove invasive trees from private property.	$	• Pursue partnerships with tree care companies to help get the message out. • Incentivize with free replacement trees (action 1.e) • Initially focus on properties located within ¼ mile of Bidwell Park.	PW O&M, partners from action 1. a
2.k	Encourage citizens to remove invasive trees from private property. Encourage partner entities to apply for recognition e.g., Tree Campus for K-12 schools and hospitals, Tree line USA for utility tree companies.		• City or partners assist with application process. • Achieve at least one signup.	PW O&M, partners from action 1.a, 2. h.

** $ Low (0-$25,000), $$ Medium ($25,000 -$50,000), $$$ High ($50,000 - $100,000), $$$ Very High (>$100,000)*

GUIDING PRINCIPLE: THE COMFORT OF TREES

Goal				
3	Increase City-wide canopy cover to 40% by 2062.			
	Action Items	**Cost**	**Method of Measurement**	**Who is Responsible**
3.a	Achieve a minimum stocking rate of 95% of all identified City-managed planting sites by 2042.	$$$	• Tree inventory is kept up to date. • Tree inventory is reassessed every decade. • Unviable planting sites are removed from the database. • 95% of vacant sites equates to approximately 8000 sites planted. • Pursue grant funding.	PW O&M
3.b	Plant at least 500 more street trees than are removed annually by the city.	$$	• Pursue replanting of vacant sites. • Stump grind removed tree sites and replant as part of a "remove and replace" strategy. • Work with development community to install ROW shade trees as part of development. • Track metrics and report annually to BPPC.	PW O&M, Planning, Building Division
3.c	Prioritize tree planting actions towards City-managed vacant sites on commercial corridors and neighborhoods with low canopy cover.	$$$	• Work with partners to identify suitable sites. • Pursue concrete removal strategies where locations would otherwise be suitable, but no tree-well exists. • Identify adjacent property owners willing to supply irrigation. • Pursue strategies to install irrigation infrastructure. • Pursue grant funding opportunities for low-income/disadvantaged neighborhoods, commercial corridors especially on walking and bus routes.	PW O&M, Planning, Building Division
3.d	Continue analysis of empty planting sites in the right-of-way. Refine list to remove those identified as unavailable.	$	• 95% inventory accuracy verified by field checks indicating viable tree planting sites.	PW

Action Items		Cost	Method of Measurement	Who is Responsible
3.e	Maintain a 5-year average survival rate of 97% for newly planted trees.	$$$	• Use Actions 1.d and 1.e to build capacity in the community for successful tree care. • Practice sustained maintenance practices for street tree establishment. • Maintain 5-year rolling average based on field surveys. • Report metrics on city website and to BPPC	PW O&M and partners 1. a
3.f	Select tree species for individual locations that will provide the highest possible canopy cover for the space given the planting area.		• Promote "right tree right place" principles.	PW
3.g	Promote the use of non-native cultivar trees with a proven record of successful establishment and growth in highly demanding municipal forest situations.		• Utilize arboretum established in action 1.n.	PW
3.h	Develop City of Chico Best Practices Manual with alternative design standards for City infrastructure such as sidewalks, streets, and curb and gutters, that increase the available space and soil volume for trees, and likelihood of tree preservation when infrastructure conflicts occur.	$	• Supplement planter and pavement design options to reduce conflicts between trees and infrastructure to include suspended pavement, pervious pavement/rubberized pavers, flexible (e.g., rubber) sidewalks. • Pursue tree-based strategies to select trees that do not exhibit high potential for infrastructure damage.	PW, Planning, Building Division
3.i	Set neighborhood tree canopy goals and measures to increase total canopy tree cover in the city.		• Analyze data to determine the required balance of public and private trees needed to achieve the desired canopy goal.	PW, GIS
3.j	Meet or exceed annual baseline Total Yearly Benefits of public tree assets of $6.6 million as measured by the USDA i-Tree Streets model.		• Run i-tree Streets annually on the citywide tree inventory and report values.	PW
3.k	Ensure no net loss of canopy cover on both public and private land.		• Measure at 10-year intervals using LiDAR or other strategies. • Canopy should not fall below 36% using same assessment area as analysis in 2021.	PW
** $ Low (0-$25,000), $$ Medium ($25,000 -$50,000), $$$ High ($50,000 - $100,000), $$$ Very High (>$100,000)*				

GUIDING PRINCIPLE: THE COMFORT OF TREES

Goal				
4	By 2033, the City-managed tree inventory will increase in resiliency and sustainability by achieving targets for species and age diversity, health condition, and transitioning to climate appropriate species.			
	Action Items	**Cost**	**Method of Measurement**	**Who is Responsible**
4.a	Limit the planting of non-native tree species that represent more than 5% of the city inventory.		• Metrics used as a guide to promote diversity in the species palette. • Chinese pistache, red maple, and crape myrtle. Are examples of trees that should	PW
4.b	Annually review the City recommended tree species list and update it as appropriate to ensure species are suitable for current and future climate conditions, are low water use, will achieve species diversity standards, and will prioritize well-adapted local and regionally native species.	$	• Report annually to BPPC with recommended changes. • Review list with industry experts and consult scientific and horticulture literature.	PW, CSU, Master Gardeners, UCANR
4.c	Ensure that the top six most common trees in the city inventory have a relative performance index score of 1 or better.		• Data compiled during inventory reassessments every decade.	PW
4.d	Conduct an analysis of tree species in the inventory that are marked as poor or critical to further understand if they are suitable for the city recommended tree species list, or if they should be removed.		• Determine cause of failure and determine biotic and abiotic factors.	PW
4.e	Develop standards for green stormwater infrastructure projects to include trees. Update the tree species selection process for such projects to align with the standards established in the UFMP.		• Adopt standards for green stormwater infrastructure projects to include trees.	PW O&M, PW ENG
4.f	Provide resources and educational materials for private property owners on current and emerging threats to trees, such as drought, pests, and diseases, and steps they can take to improve tree health.	$	• Goal expands on 1.a	PW
4.g	Develop a ‘deferred’, ‘preferred’, ‘restricted’, ‘prohibited’ list of trees for use in the right-of-way.	$	• Promote strategy with Landscape architects. Monitor tree palette composition of landscape plans submitted during the development process. • Modify annually and report to BPPC. • Promote changes on city website and distribution lists.	PW, 1a partners

Action Items		Cost	Method of Measurement	Who is Responsible
4.h	Conduct an analysis of the Northern California black walnut (Juglans hindsii) species, to identify strategies that preserve trees in the short-term. and replace failing trees over the long-term.		• Identify large stature walnuts that are candidates for pruning. • Trees exhibiting >50% dead canopy are removal candidates.	PW
4.i	Develop a long-term plan to replace failing trees based on analysis of the Northern California black walnut (Juglans hindsii).	$$	• Monitor population and size classes.	PW
4.j	Continue to expand the Tree Inventory and include designated trails in Bidwell Park and other open spaces.	$$	• Continue program started on Petersen and South Park Drive to tag and assess trees >12" DBH on designated trails in lower and middle park.	PW
** $ Low (0-$25,000), $$ Medium ($25,000 -$50,000), $$$ High ($50,000 - $100,000), $$$ Very High (>$100,000)*				

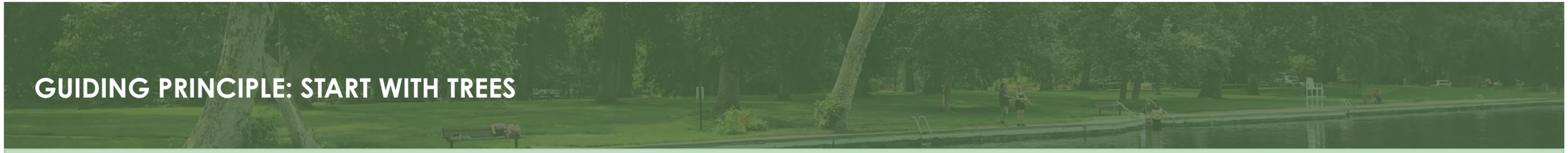
GUIDING PRINCIPLE: START WITH TREES

Goal				
5	By 2028, City planning processes, ordinances, and policies will be aligned with the standards of the UFMP.			
Action Items		**Cost**	**Method of Measurement**	**Who is Responsible**
5.a	Ensure that Urban Forest policies and procedures are incorporated into other City standards and management plans.		• Highlight examples of included messaging in staff reports to BPPC.	All City
5.b	Review and update the Municipal Code Section 16.66: Tree Preservation Regulations to ensure that defined protected tree regulations apply to all private property trees regardless of qualifications, entitlements, or lot size.		• Review to determine suitable exemptions.	PW, Planning
5.c	Update the City Tree Preservation Regulations to apply to capital improvement projects, so trees removed through a project will require replacement.		• Monitor CIP projects in the same way as private property development projects.	PW, Planning
5.d	Develop, standards and guidelines to better protect and preserve trees during construction.	$	• Determine which types of trees should be monitored for long-term survival after development. • Report to BPPC findings with assessment of effectiveness of tree preservation guidelines.	PW, Planning
5.e	Update the standards for new residential developments to require a tree planting plan that will lead to 40% canopy cover for the development project.	$	• Develop exemptions based on physical site characteristics. • Cross reference goal 7. d.	PW, Planning, Building Division
5.f	Update the General Plan to adopt the canopy cover and urban forestry goals of the UFMP.		• Updated General Plan.	PW, Planning
5.g	Update the General Plan to reference species selection, planting guidelines, and other best management practices identified in the UFMP.		• Updated General Plan.	PW, Planning
5.h	Ensure the permit review process for landscape plans aligns with goals of the UFMP and are approved in consultation with the City's urban forester or a City-qualified certified arborist prior to issuance of permits.		• Review staffing plans to ensure timely reviews of landscape plans by a qualified arborist.	PW, Planning, Building Division

Action Items		Cost	Method of Measurement	Who is Responsible
5.i	Update the City Design Guidelines Manual to include tree planting guidance and landscape design standards that include minimum tree planting requirements by land use type.	$$	• Guidance will include placement of trees during the landscape plan review process to avoid impeding sight distance views at intersections. • Landscape Design Standards to enhance water conservation and improve soil health issues. • Develop guidelines for innovative ways to add trees to development projects in situations with limited planting space. • Identify desirable trees for preservation at the beginning of the design process so engineering solutions can be developed for their protection. • Review sidewalk design and ROW tree planting criteria to mitigate sidewalk displacement by tree roots.	PW, Planning, Building Division, consultant
5.j	Establish and implement a performance bond process for development projects to ensure trees are successful 5 years after planting.		• Monitor long-term survival of trees.	PW
5.k	Adopt a policy requiring trees in streetscape improvement projects.		• Extend the "Complete Streets "concept to specifically include suitable shade trees, particularly along pedestrian and bike paths.	PW O&M, PW ENG, Planning, Building Division
5.l	Explore the development of a private tree ordinance to protect trees on private property not associated with development.	$	• Continue public outreach to build off feedback received during development of this UFMP. • Conduct analysis of private tree ordinances in California. • Develop language suitable for Chico including qualifying criteria (example by species, size, location on property), protection against improper pruning practices such as tree-topping, mitigation measures, exemptions. • Report findings to BPPC.	PW, Planning

Action Items		Cost	Method of Measurement	Who is Responsible
5.m	Update and promote the Heritage Tree Ordinance and celebrate historically significant trees.		• Conduct an analysis of similar programs. • Create a survey to determine reasons for low take-up. • Modify regulations to increase participation from private property owners.	PW
5.n	Update Title 14 to improve its functionality.	$	• Update Street Tree Law ordinance to allow for enhanced penalties and enforcement of illegal public tree removals. • Update language.	PW
5.o	Develop programs to remove and replace invasive trees on public property.	$$	• Program compliments action 2.j on private property. • Initially focus on properties located within ¼ mile of Bidwell Park.	PW
5.p	Develop a procedure for final approval and acceptance of projects once complete, including the requirement that as-builts are received and scanned in a timely manner.	$	• Landscape inspection procedures for final Certificate of Occupancy issuance clarified. • Training provided to Planning staff for landscape inspections of private landscape elements.	PW, Planning, Building Division
5.q	Explore the necessity of a city Solar ordinance.	$	• Monitor number of solar/tree conflicts to determine the necessity.	PW, Planning
5.r	Coordinate with stormwater managers to recognize the important contribution and value of trees and tree canopy in stormwater and flood requirements for 85 percentile storm control management plans and strategies.	$	• Ref 5. l	PW O&M PW ENG
5.s	Coordinate with floodplain managers and GIS staff to analyze and model strategies to supplement stormwater and flood control.	$	• Green Stormwater Infrastructure (GSI) strategies considered.	PW O&M, PW ENG, GIS
5.t	Promote trees and canopy as an efficient and cost-effective part of the solution to managing stormwater.	$	• Ref 5 l.	PW O&M, PW ENG
5.u	Encourage and promote the benefits of stormwater planting pits, swales, channels, and other designs intended to capture and retain stormwater for use by urban trees.	$$	• Install at least one demonstration site with incorporated stormwater capture designs, such as Silva Cells.	PW O&M, PW ENG

Action Items		Cost	Method of Measurement	Who is Responsible
5.v	Supplement design standards to support the construction of suspended sidewalks, curb drains, stormwater tree pits, and other designs that promote the temporary storage and infiltration of stormwater; especially in areas with a high percentage of impervious surface and where planter space is limited (e.g., commercial, and downtown areas).	$$	• Design Standards updated	PW O&M, PW ENG
5.w	Encourage development designs that support the State MS4 General Permit requirements that include provisions for matching the predevelopment hydrograph for 85 percentile storm events with the post-development hydrograph, thereby reducing stormwater and channeling valuable water to support trees and other landscaping.	$	• Design Standards updated	PW O&M, PW ENG
** $ Low (0-$25,000), $$ Medium ($25,000 -$50,000), $$$ High ($50,000 - $100,000), $$$ Very High (>$100,000)*				



GUIDING PRINCIPLE: START WITH TREES

Goal	
6	By 2028, the City will have tree management practices and policies that lead to sustainable management of the urban forest.

Action Items		Cost	Method of Measurement	Who is Responsible
6.a	Achieve a 5-to-7-year pruning cycle of all City-managed trees.		• All City-managed trees pruned or inspected every 5-to-7-years.	PW O&M
6.b	Annually conduct a level 1 survey on City-managed trees.	$	• Target 10,000 trees per year. • Staff possessing TRAQ credential windshield survey to identify clear defects.	PW O&M
6.c	Complete first formative pruning of trees within 5 years after planting.	$	• As part of 6.a young tree care will ensure reduced future maintenance.	PW O&M
6.d	Provide all newly planted trees a minimum of 3 years of establishment care and watering.	$$$	• Goal 7.g provides one FT Maintenance Worker to focus on young tree care. • Goal 3.e provides proxy for success.	PW O&M
6.e	Identify veteran trees in Bidwell Park and develop additional protection, preservation, and maintenance standards appropriate for their age and condition.	$$$	• Veteran tree definition criteria established. • Identified trees assessed at ISA Level 2 and added to TreeKeeper database. • Determine equipment and training needs for inhouse Level 3 ISA assessments; Cost Benefit Analysis conducted to compare costs of service provided by consultant. • Cross reference with action point 6. s.	PW O&M
6.f	Develop a program to auction high value wood removals to the highest bidder.	$	• Report dollar value of proceeds to BPPC.	PW O&M
6.g	Update standard details to align with the standards discussed in this UFMP (Technical Assessment Section 5.3).	$	• Updated standard details.	PW O&M, PW ENG
6.h	Implement the street tree planting plan included in this UFMP.	$$$	• Report annually to BPPC numbers, location and types of trees planted.	PW O&M

Action Items		Cost	Method of Measurement	Who is Responsible
6.i	Ensure all identified dead trees in the city managed tree inventory are removed annually.	$$$	• Report removal numbers to BPPC	PW O&M
6.j	Address emergencies and urgent tree work within one week of notification.	$	• Report from service request database response time.	PW O&M
6.k	Promote the elevation of limbs and foliage for traffic safety and line of site clearance at intersections as a high priority.	$	• Report on number of trees pruned annually for sightline issues.	PW O&M
6.l	Program Downtown elevations, sightlines and building clearance at least every other year as needed.	$	• Report numbers of trees pruned.	PW O&M
6.m	Program volunteer tree removal from alleyways on a mid-term cycle.	$	• When schedule allows, remove volunteer trees that are an encroachment issue.	PW O&M
6.n	Revise tree pruning and productivity standards for Public Works and contractors.		• Report number of trees pruned per year	PW O&M
6.o	Develop city and contractor workflows and equipment needs to ensure the inventory is updated as trees are removed, planted, or pruned.	$	• Provide training, tools and software to allow in-house and contractor staff to update work orders in the field.	PW O&M
6.p	Develop and promote the concept of "whole tree life cycle" to include salvaged wood and use of wood products.	$	• Develop outreach materials for print, website, and social media	PW O&M, PIO
6.q	Research local wood workers, tree care companies, and resource recovery operations that may be able to use wood waste generated by the city.	$	• Develop "highest and best use" strategy.	PW O&M
6.r	Create partnerships with companies identified in 6.q and individuals who can use City-generated wood waste.	$	• Report of board feet milled. • Highlight end use of wood products.	PW O&M
6.s	Work with Risk Management to create a tree risk management strategy that identifies objectives and action thresholds for tree risk management, coordinates risk management objectives with a tree inspection program, prioritizes risk mitigation measures and coordinates with work plans, identifies risk assessment priorities, protocols, policies, and final authority for removals, and adds urban forest risk management policies to the City Hazard Mitigation Plan.	$	• Define policies and procedures for tree removal, both during development and in the city ROW.	PW O&M

Action Items		Cost	Method of Measurement	Who is Responsible
6.t	Develop a Policies and Procedures manual that outlines group operations, best management practices and official policies and procedures that guide day-to-day urban forestry operations.	$	• Technical manual for staff created	PW O&M
6.u	Coordinate management strategies for trees in utility rights-of-way including electric, natural gas, water, and other utilities.		• Uphold best management practices to ensure long-term health of the urban forest. Renew and update permit processes and fees. • Uphold that the least amount of work required to meet objectives is done.	PW O&M, PW ENG
6.v	Develop a policy and identify responsibility for quality control, quality assurance, and auditing of tree care operations that are performed by contracted staff to ensure compliance with contract specifications.		• Report on number of call-backs.	PW O&M
6.w	Identify department staff with an interest in tree care. Develop and implement a training program on basic tree care skills, including small branch removal, young tree training, and risk identification. Mentor individuals who demonstrate an aptitude and interest for arboriculture and provide opportunities for advancement and certification pay.	$	• Develop a process that incentivizes City staff to obtain Tree Risk Assessment Qualification (TRAQ) through the International Society of Arboriculture (ISA). (Assists goal 6.b) • Report on certifications attained by Public Works staff.	PW O&M
6.x	Use GIS analytics to evaluate service request/work orders to identify areas of high maintenance concentration and to identify patterns related to disease, pests, or other specific maintenance issues. This data will help inform where pro-active tree management should focus.		• Report findings to BPPC	PW O&M
** $ Low (0-$25,000), $$ Medium ($25,000 -$50,000), $$$ High ($50,000 - $100,000), $$$ Very High (>$100,000)*				

GUIDING PRINCIPLE: SUSTAINABLE RESOURCES

Goal				
7	By 2033, the city will have the resources to fully support implementation of the UFMP.			
Action Items		**Cost**	**Method of Measurement**	**Who is Responsible**
7.a	Achieve appropriate funding to meet Goal OS-6 of the General Plan, to ensure a healthy and robust urban forest.	$$$$	• Annual increase in funding until desired goal is met.	PW O&M
7.b	Continue to seek external funding sources that support tree planting and establishment care projects like the Community Choice Aggregation (CCA) program, to reduce the energy load on the grid by providing shade trees to residents.	$$	• Other sources of funding include dispensary tax, Inflation Reduction Act urban forestry funding.	PW O&M
7.c	Conduct an analysis of mitigation and in-lieu fees to determine if fees are adequate to replace and care for newly planted trees and adjust fees as appropriate.	$	• Conduct fee study and make recommendations	PW O&M
7.d	Explore opportunities to leverage future development projects to increase resources for urban forest management.	$	• Cross reference action item 5. e.	PW O&M
7.e	Annually provide a report on the City's return on investment from the funding that is allocated to urban forest management.	$	• Report to BPPC	PW O&M
7.f	Ensure the City has funding to create a staff position or on-call contract for a certified arborist to effectively manage and implement planning policies on private property including code enforcement, site plan review, post-installation inspections.	$	• Public Works report to BPPC on proposed staffing changes.	PW O&M
7.g	Review 2017 Staffing plan to determine revised needs to attain the goal of General Plan goal OS-6. Include 1 FT position focused on young tree care establishment.	$$$$	• Cross reference action items 6.a, 6.n, 6. J.	PW O&M
7.h	Ensure a City arborist is directly involved in reviewing new development designs, project permits, and removal applications to ensure best arboricultural practices are being instituted.		• Ref 7.f.	PW O&M, Planning
7.i	In partnership with other agencies, bring International Society of Arboriculture training opportunities to Chico that will help support the greater arboriculture industry north of Sacramento.		• Report on number and type of ISA courses hosted in the Chico area. • Report on number of candidates assessed.	PW O&M, CARD
7.j	Pursuant with accepted tree removal policy, establish revenue streams from recycled wood.		• Ref 6.f	PW O&M

Action Items		Cost	Method of Measurement	Who is Responsible
7.k	Explore corporate sponsorship opportunities for the Heritage Tree Program.		• Goal to identify one tree care company that will offer reduced cost of tree maintenance on private Heritage Trees.	PW O&M
7.l	Assess fleet age, condition, and usage hours to determine when equipment used for urban forest maintenance will need to be replaced; once identified, begin purchasing process at least one year prior to the projected "aging out" date.		• Report assessment to PW Fleet manager	PW O&M
7.m	Consider providing the tree crew with a smaller aerial truck for easier maneuvering around the city.		• Report assessment to PW Fleet manager ref 7.l	PW O&M
7.n	Rent or contract for specialty equipment that would not be used often for urban forest management and/or by any other department in the city, or, consider sharing specialty equipment with other nearby cities.		• e.g., Stump grinder.	PW O&M
7.o	Develop a policy to budget for or pursue grant funding to re-inventory publicly owned trees every ten years.	$$$	• Pursue grant funding. • Pursue outreach initiatives to engage the community and interested groups to learn about condition assessments of community trees	PW O&M, CalFire
7.p	Optimize funding from newly established assessment districts CMD's (Chico Maintenance Districts). Work with Public Works Engineering to ensure adequate funding is built into assessment schedules for cyclical tree maintenance.		• Provide amortization costs associated with whole tree life cycle.	PW O&M
7.q	Develop a Pest Vulnerability Matrix		• Liaise with Ag Commissioner and UC Extension agents to determine current and future biological threats.	PW, UCANR
7.r	Develop Emerald Ash Borer (EAB) Action Plan.	$	• If EAB arrives in California from Oregon, monitor and report on the 1179 ash trees in the ROW in Chico	PW O&M
7.s	Develop an Integrated Pest Management Program (IPM)	$	• Report on effective ways to reduce the amount of pesticides used on City landscapes.	PW O&M

** $ Low (0-$25,000), $$ Medium ($25,000 -$50,000), $$$ High ($50,000 - $100,000), $$$ Very High (>$100,000)*

IMPLEMENTATION PLAN

Year 1 Priority Actions

Action Item #			Responsible
1	1.a	Develop an urban forest advisory committee consisting of City staff, community members, and other invested stakeholders to ensure a broad range of voices have a say in urban forest practices in Chico.	PW O&M, and all City departments
2	1.b	Identify both communities of place and communities of interest to grow the network of partners, to assist in community engagement and outreach activities	City with collaboration partners from 1.a
3	1.e	In partnership with the Butte Environmental Council, hold quarterly community engagement activities such as tree planting and care events, educational workshops, and free tree give aways.	BEC and partners from 1.a
4	1.f	Collaborate with a local utility company to develop a free residential shade tree giveaway program.	City and participating utilities
5	1.g	Develop an incentive program that offsets the cost to water a newly planted tree over three years, when residential property owners elect to provide establishment care for a newly planted City-managed tree.	PW and partnering entities
6	1.h	Many desirable tree species are not readily available in the nursery trade. Explore the possibility of a city tree nursery in partnership with civic and non-profit groups.	PW O&M, with collaboration partners from 1.a
7	1.o	Explore and integrate the use of smart phone and tablet applications that support GPS for self-guided tours, tree and urban forest information, games and scavenger hunts that facilitate learning.	Climate Action Corps, educational institutions
8	2.i	Continue to develop programs with Chico Unified School District regarding plantings, species selection, maintenance, management of landscapes, and Arbor Day events.	BEC, CUSD, City
9	3.d	Continue analysis of empty planting sites in the right-of-way. Refine list to remove those identified as unavailable.	PW
10	3.f	Select tree species for individual locations that will provide the highest possible canopy cover for the space given the planting area.	PW
11	3.i	Set neighborhood tree canopy goals and measures to increase total canopy tree cover in the City.	PW, GIS
12	4.a	Limit the planting of non-native tree species that represent more than 5% of the City inventory.	PW
13	4.f	Provide resources and educational materials for private property owners on current and emerging threats to trees, such as drought, pests, and diseases, and steps they can take to improve tree health.	PW

Action Item #			Responsible
14	4.g	Develop a ‘deferred’, ‘preferred’, ‘restricted’, and ‘prohibited’ list of trees for use in the right-of-way.	PW, 1a partners
15	5.b	Review and update the Municipal Code Section 16.66: Tree Preservation Regulations to ensure that defined protected tree regulations apply to all private property trees regardless of qualifications, entitlements, or lot size.	PW, Planning
16	6.b	Annually conduct a level 1 survey of all City-managed trees.	PW O&M
17	7.a	Achieve appropriate funding to meet Goal OS-6 of the General Plan, to ensure a healthy and robust urban forest.	PW O&M
18	7.i	In partnership with other agencies, bring International Society of Arboriculture training opportunities to Chico that will help support the greater arboriculture industry north of Sacramento.	PW O&M, CARD
19	7.q	Develop a Pest Vulnerability Matrix	PW, UCANR

Year 2 – 6 Priority Actions

Action Item #			Responsible
20	1.c	Create a chicotrees.org webpage for community input on the Tree Division Urban Forestry, display current urban forest data like canopy cover, tree inventory statistics, current legislation and annual trees planted and removed.	City
21	1.d	Develop a comprehensive education program to enhance community member understanding of tree maintenance practices including planting, establishment care, pruning, costs of deferred maintenance and the importance of continuing to water trees to maintain tree health during drought conditions.	PW O&M, with collaboration partners from 1.a
22	1.i	Develop outreach efforts that manage resident expectations when non-emergency service requests are submitted.	PW O&M, PIO
23	1.j	Promote habitat values of city street trees and how they act as wildlife corridors from larger open spaces.	PW
24	1.k	Support and develop use of the city owned urban forest as a resource for increasing community food resilience and access to locally sourced food.	Partners from 1.a, Climate Action Corp, BCLFN, BEC
25	1.l	Incorporate urban forestry messaging into existing City initiatives.	PW O&M, PIO, BPPC
26	1.m	Develop plans to direct tree planting and maintenance activities to neighborhoods with the highest need.	PW O&M, Planning, GIS
27	1.n	Develop a demonstration arboretum that highlights trees adapted to projected changes in climate.	PW O&M, PIO, UCANR, CSU, CARD, other partners from 1a
28	2.a	Public outreach during the development of this UFMP indicates that parking lot shade is inadequate. Evaluate the effectiveness of Municipal Code 19.70.60. Identify reasons for success and failure.	Building Division, GIS, CSU, PW O&M, partners from 1.a
29	2.b	Update Municipal Code 19.70.60 parking lot standards for tree planting that provides adequate space and soil volume to support long-term tree growth and health.	Building Division, GIS, PW O&M, partners from 1.a

Action Item #			Responsible
30	2.c	Enforce Municipal Code 19.70.60, which requires parking lots to be covered with 50% shade by year 15. General Plan Action OS-6.1.1 (Urban Forest Maintenance) "Working with commercial parking lot owners to improve the shade canopy."	Building Division, GIS, PW O&M, partners from 1.a
31	2.d	Develop parking lot tree planting standards workshops in collaboration with Building Development.	PW O&M, PIO, CoC, water utility provider, BEC
32	2.e	Develop a comprehensive educational program for commercial, retail, and industrial landowners on how trees add economic value to their business or property, City standards, proper tree maintenance practices, and the importance of continuing to water trees to maintain tree health during drought conditions.	PW O&M, PIO, CoC, water utility provider, BEC
33	2.f	Enforce tree pruning Best Management Practices (BMPs) on private commercial parking lots that are a requirement of development.	PW O&M, PIO, CoC, water utility provider, BEC
34	2.g	Provide resources to Butte Environmental Council to conduct outreach and engagement efforts to businesses along commercial corridors and retail centers.	PW O&M, PIO, CoC, water utility provider, BEC
35	2.h	Develop an urban forest coalition comprised of other significant local and regional landowners like Chico Area Recreation and Park District, Chico Unified School District, Chico State University, Mechoopda Tribe, Butte County, utility companies, and others to ensure shared urban forest goals and policies.	Build on partners from action 1.a
36	3.b	Plant at least 500 more street trees than are removed annually by the City.	PW O&M, Planning, Building Division
37	3.c	Prioritize tree planting actions towards City-managed vacant sites on commercial corridors and neighborhoods with low canopy cover.	PW O&M, Planning, Building Division
38	3.e	Maintain a 5-year average survival rate of 97% for newly planted trees.	PW O&M and partners 1.a
39	3.g	Promote the use of non-native cultivar trees with a proven record of successful establishment and growth in highly demanding municipal forest situations.	PW
40	3.h	Develop City of Chico Best Practices Manual with alternative design standards for City infrastructure such as sidewalks, streets, and curb and gutters, that increase the available space and soil volume for trees, and likelihood of tree preservation when infrastructure conflicts occur.	W, Planning, Building Division
41	3.j	Meet or exceed annual baseline Total Yearly Benefits of public tree assets of $6.6 million as measured by the USDA i-Tree Streets model.	PW
42	4.b	Annually review the City recommended tree species list and update it as appropriate to ensure species are suitable for current and future climate conditions, are low water use, will achieve species diversity standards, and will prioritize well-adapted local and regionally native species.	PW, CSU, Master Gardeners, UCANR
43	4.d	Conduct an analysis of tree species in the inventory that are marked as poor or critical to further understand if they are suitable for the City recommended tree species list, or if they should be removed.	PW
44	4.h	Conduct an analysis of the Northern California black walnut (Juglans hindsii) species, to identify strategies that preserve trees in the short-term. and replace failing trees over the long-term.	PW

Action Item #			Responsible
45	4.i	Develop a long-term plan to replace failing trees based on analysis of the Northern California black walnut (Juglans hindsii).	PW
46	5.a	Ensure that Urban Forest policies and procedures are incorporated into other City standards and management plans.	All City
47	5.c	Update the City Tree Preservation Regulations to apply to capital improvement projects, so trees removed through a project will require replacement.	PW, Planning
48	5.d	Develop, standards and guidelines to better protect and preserve trees during construction.	PW, Planning
49	5.e	Update the standards for new residential developments to require a tree planting plan that will lead to 40% canopy cover for the development project.	PW, Planning, Building Division
50	5.f	Update the General Plan to adopt the canopy cover and urban forestry goals of the UFMP.	PW, Planning
51	5.g	Update the General Plan to reference species selection, planting guidelines, and other best management practices identified in the UFMP.	PW, Planning
52	5.h	Ensure the permit review process for landscape plans aligns with goals of the UFMP, and are approved in consultation with the City's urban forester or a City-qualified certified arborist prior to issuance of permits.	PW, Planning, Building Division
53	5.i	Update the City Design Guidelines Manual to include tree planting guidance and landscape design standards that include minimum tree planting requirements by land use type.	PW, Planning, Building Division, consultant
54	5.j	Establish and implement a performance bond process for development projects to ensure trees are successful 5 years after planting.	PW
55	6.d	Provide all newly planted trees a minimum of 3 years of establishment care and watering.	PW O&M
56	6.e	Identify veteran trees in Bidwell Park and develop additional protection, preservation, and maintenance standards appropriate for their age and condition.	PW O&M
57	6.f	Develop a program to auction high value wood removals to the highest bidder.	PW O&M
58	6.g	Update standard details to align with the standards discussed in this UFMP (Technical Assessment Section 5.3).	PW O&M, PW ENG
59	6.h	Implement the street tree planting plan included in this UFMP.	PW O&M
60	6.i	Ensure all identified dead trees in the City managed tree inventory are removed annually.	PW O&M
61	6.l	Program Downtown elevations, sightlines and building clearance at least every other year as needed.	PW O&M
62	6.k	Promote the elevation of limbs and foliage for traffic safety and line of site clearance at intersections as a high priority.	PW O&M
63	6.l	Program Downtown elevations, sightlines and building clearance at least every other year as needed.	PW O&M

Action Item #			Responsible
64	6.n	Revise tree pruning and productivity standards for Public Works and contractors.	PW O&M
65	6.o	Develop city and contractor workflows and equipment needs to ensure the inventory is updated as trees are removed, planted, or pruned.	PW O&M
66	6.p	Develop and promote the concept of "whole tree life cycle" to include salvaged wood and use of wood products.	PW O&M
67	6.q	Research local wood workers, tree care companies, and resource recovery operations that may be able to use wood waste generated by the City.	PW O&M
68	6.t	Develop a Policies and Procedures manual that outlines group operations, best management practices and official policies and procedures that guide day-to-day urban forestry operations.	PW O&M
69	6.u	Coordinate management strategies for trees in utility rights-of-way including electric, natural gas, water and other utilities.	PW O&M, PW ENG
70	6.w	Identify department staff with an interest in tree care. Develop and implement a training program on basic tree care skills, including small branch removal, young tree training, and risk identification. Mentor individuals who demonstrate an aptitude and interest for arboriculture and provide opportunities for advancement and certification pay.	PW O&M
71	6.x	Use GIS analytics to evaluate service request/work orders to identify areas of high maintenance concentration and to identify patterns related to disease, pests, or other specific maintenance issues. This data will help inform where pro-active tree management should focus.	PW O&M
72	7.b	Continue to seek external funding sources that support tree planting and establishment care projects like the Community Choice Aggregation (CCA) program, to reduce the energy load on the grid by providing shade trees to residents.	PW O&M
73	7.c	Conduct an analysis of mitigation and in-lieu fees to determine if fees are adequate to replace and care for newly planted trees and adjust fees as appropriate.	PW O&M
74	7.d	Explore opportunities to leverage future development projects to increase resources for urban forest management.	PW O&M
75	7.e	Annually provide a report on the City's return on investment from the funding that is allocated to urban forest management.	PW O&M
76	7.f	Ensure the City has funding to create a staff position or on-call contract for a certified arborist to effectively manage and implement planning policies on private property including code enforcement, site plan review, post-installation inspections.	PW O&M

Action Item #			Responsible
77	7.g	Review 2017 Staffing plan to determine revised needs to attain the goal of General Plan goal OS-6. Include 1 FT position focused on young tree care establishment.	PW O&M
78	7.h	Ensure a City arborist is directly involved in reviewing new development designs, project permits, and removal applications to ensure best arboricultural practices are being instituted.	PW O&M, Planning
79	7.l	Assess fleet age, condition, and usage hours to determine when equipment used for urban forest maintenance will need to be replaced; once identified, begin purchasing process at least one year prior to the projected "aging out" date.	PW O&M
80	7.n	Rent or contract for specialty equipment that would not be used often for urban forest management and/or by any other department in the city, or, consider sharing specialty equipment with other nearby cities.	PW O&M
81	7.o	Develop a policy to budget for or pursue grant funding to re-inventory publicly owned trees every ten years.	PW O&M, CalFIRE
82	7.p	Optimize funding from newly established assessment districts CMD's (Chico Maintenance Districts). Work with Public Works Engineering to ensure adequate funding is built into assessment schedules for cyclical tree maintenance.	PW O&M
83	7.r	Develop Emerald Ash Borer (EAB) Action Plan.	PW O&M
84	7.s	Develop an Integrated Pest Management Program (IPM)	PW O&M

Years 7 – 11 Priority Actions

Action Item #			Responsible
85	1.p	Chico attains recognition for promotion of urban forestry standards.	BPPC, PW O&M, PIO
86	2.j	Encourage citizens to remove invasive trees from private property.	PW O&M, partners from action 1. a
87	2.k	Encourage partner entities to apply for recognition e.g., Tree Campus for K-12 schools and hospitals, Tree line USA for utility tree companies.	PW O&M, partners from action 1.a, 2.h.
88	3.k	Ensure no net loss of canopy cover on both public and private land.	PW
89	4.c	Ensure that the top six most common trees in the City inventory have a relative performance index score of 1 or better.	PW
90	4.e	Develop standards for green stormwater infrastructure projects to include trees. Update the tree species selection process for such projects to align with the standards established in the UFMP.	PW O&M, PW ENG
91	4.j	Continue to expand the Tree Inventory and include designated trails in Bidwell Park and other open spaces.	PW
92	5.k	Adopt a policy requiring trees in streetscape improvement projects.	PW O&M, PW ENG, Planning, Building Division
93	5.l	Explore the development of a private tree ordinance to protect trees on private property not associated with development.	PW, Planning
94	5.m	Update and promote the Heritage Tree Ordinance and celebrate historically significant trees.	PW
95	5.n	Update Title 14 to improve its functionality.	PW
96	5.o	Develop programs to remove and replace invasive trees on public property.	PW
97	5.p	Develop a procedure for final approval and acceptance of projects once complete, including the requirement that as-builts are received and scanned in a timely manner.	PW, Building Division
98	5.q	Explore the necessity of a city Solar ordinance.	PW, Planning
99	5.r	Coordinate with stormwater managers to recognize the important contribution and value of trees and tree canopy in stormwater and flood requirements for 85 percentile storm control management plans and strategies.	PW O&M PW ENG
100	5.s	Coordinate with floodplain managers and GIS staff to analyze and model strategies to supplement stormwater and flood control.	PW O&M, PW ENG, GIS
101	5.t	Promote trees and canopy as an efficient and cost-effective part of the solution to managing stormwater.	PW O&M, PW ENG

Action Item #			Responsible
102	5.u	Encourage and promote the benefits of stormwater planting pits, swales, channels and other designs intended to capture and retain stormwater for use by urban trees.	PW O&M, PW ENG
103	5.v	Supplement design standards to support the construction of suspended sidewalks, curb drains, stormwater tree pits, and other designs that promote the temporary storage and infiltration of stormwater; especially in areas with a high percentage of impervious surface and where planter space is limited (e.g., commercial and downtown areas).	PW O&M, PW ENG
104	5.w	Encourage development designs that support the State MS4 General Permit requirements that include provisions for matching the predevelopment hydrograph for 85 percentile storm events with the post-development hydrograph, thereby reducing stormwater and channeling valuable water to support trees and other landscaping.	PW O&M, PW ENG
105	6.a	Achieve a 5-to-7-year pruning cycle and inspection cycle of all City-managed trees.	PW O&M, PW ENG
106	6.c	Complete first formative pruning of trees within 5 years after planting.	PW O&M
107	6.m	Program volunteer tree removal from alleyways on a mid-term cycle.	PW O&M
108	6.j	Address emergencies and urgent tree work within one week of notification.	PW O&M
109	7.k	Explore corporate sponsorship opportunities for the Heritage Tree Program.	PW O&M

Years 12 – 16 Priority Actions

Action Item #			Responsible
110	2.i	Maintain programs with Chico Unified School District regarding plantings, species selection, maintenance, management of landscapes, and Arbor Day events.	BEC, CUSD, City
111	3.a	Maintain a minimum stocking rate of 95% of all identified City-managed planting sites by 2042.	PW O&M
112	3.b	Maintain planting at least 500 more street trees than are removed annually by the City.	PW O&M, Planning, Building Division
113	3.e	Maintain a 5-year average survival rate of 97% for newly planted trees.	PW O&M and partners 1.a
114	3.j	Maintain annual baseline Total Yearly Benefits of public tree assets of $6.6 million as measured by the USDA i-Tree Streets model.	PW
115	4.b	Maintain annual review of the City recommended tree species list and update it as appropriate to ensure species are suitable for current and future climate conditions, are low water use, will achieve species diversity standards, and will prioritize well-adapted local and regionally native species.	PW, CSU, Master Gardeners, UCANR
116	6.a	Maintain a 5-to-7-year pruning cycle and inspection cycle of all City-managed trees.	PW O&M, PW ENG
117	6.b	Maintain annual level 1 survey of all City-managed trees.	PW O&M
118	6.c	Continue the cycle of formative pruning of trees within 5 years after planting.	PW O&M
119	6.d	Maintain providing all newly planted trees a minimum of 3 years of establishment care and watering.	PW O&M
120	6.i	Maintain annual removal of all identified dead trees in the City managed tree inventory.	PW O&M
121	6.l	Maintain programming Downtown elevations, sightlines and building clearance at least every other year as needed.	PW O&M
122	6.r	Create partnerships with companies identified in 6.q and individuals who can use City-generated wood waste.	PW O&M, PIO
123	6.s	Work with Risk Management to create a tree risk management strategy that identifies objectives and action thresholds for tree risk management, coordinates risk management objectives with a tree inspection program, prioritizes risk mitigation measures and coordinates with work plans, identifies risk assessment priorities, protocols, policies, and final authority for removals, and adds urban forest risk management policies to the City Hazard Mitigation Plan.	PW O&M
124	6.v	Develop a policy and identify responsibility for quality control, quality assurance, and auditing of tree care operations that are performed by contracted staff to ensure compliance with contract specifications.	PW O&M

Action Item #			Responsible
125	7.e	Maintain annually providing a report on the City's return on investment from the funding that is allocated to urban forest management.	PW O&M
126	7.i	Maintain partnerships with other agencies that bring International Society of Arboriculture training opportunities to Chico that will help support the greater arboriculture industry north of Sacramento.	PW O&M, CARD
127	7.j	Pursuant with accepted tree removal policy, establish revenue streams from recycled wood.	PW O&M
128	7.m	Consider providing the tree crew with a smaller aerial truck for easier maneuvering around the city.	PW O&M

Photo by Sigmund Sieminski

MONITORING PLAN

The UFMP is an adaptive document that should be reviewed periodically to verify that the goals and objectives are realistic and obtainable based on changes to the City's environmental and economic conditions. The specific actions for periodic review are contained within the monitoring plan and will provide measurable outcomes to determine progress toward the completion of goals and objectives. The monitoring plan is based on the Vibrant Cities Lab, *Community Assessment and Goal-Setting Tool* which is based off the work of Clark et al. (1997) and subsequent updates and revisions by Kenney, van Wassanaer, and Satel (2011) and Leff (2016) and establishes criteria and indicators to measure urban forest sustainability. The Chico Working Group completed the monitoring plan during two meetings in the Spring of 2022 and by consensus scored the Chico urban forest program using the *Community Assessment and Goal-Setting Tool*.

The tool works by stating a desired condition of an urban forest and asking the user to rate the current level of this condition in the City using a numerical rating. It then asks for another numerical rating to indicate what the desired goal for that condition is. The low-level score of -1 reflects actions that have a negative impact. The optimal level score of 4 reflects the best possible standard. The "Total Current Score" reflects the perceived state of how a city is functioning, the "Total Goal Score" where a city wants to be, and the "Gap Score" reflects how far a city is from its desired goal (Vibrant Cities Lab 2018). The "Gap Score" the gap between the current status and a sustainable urban forest program.

RESULTS

The table below reflects a summary of the results for each individual section of the Assessment tool. A city that has a gap score between 20 to 40 is close to achieving the goals of its urban forest program and is progressing towards a sustainable urban forest. Conversely, a gap score of 40+ indicates that a city needs to enhance the implementation of programs and policies to close the gap. While the results show a 'Gap' number of 57 to achieve a sustainable urban forest program, the 'Current' score reflects that the City is already performing many management tasks at a high level.

Section	Current	Goal	Gap
Measure Your Current Tree Canopy and Set Goals	2	4	2
Urban Forest Inventory and Assessment	5	8	3
Know What's Happening to Trees in Your Community	4	8	4
Urban Forest Characteristics	4	6	2
Engaging Peers and Residents in Process	6	14	8
Creating Essential, Effective Public/Private Partnerships	3	10	7
Resource Management: Planning	-1	8	9
Resource Management: Implementation	7	22	15
Resource Management: Monitoring and Maintenance	5	12	7
Total	**35**	**92**	**57**

Scores for individual sections are presented in the following tables.

MEASURE YOUR CURRENT TREE CANOPY AND SET GOALS

Canopy Cover: No Data, No Action	Current	Goal	Gap
Achieve desired degree of tree cover, based on potential or according to goals set for entire municipality and for each neighborhood or land use.	Good (2) The existing canopy is >75%-100% of desired.	Optimal (4) The existing canopy is >75%-100% of desired – at individual neighborhood level as well as overall municipality.	2

URBAN FOREST INVENTORY AND ASSESSMENT

Inventory	Current	Goal	Gap
Current and comprehensive inventory of tree resource to guide its management, including data such as age distribution, species mix, tree condition, and risk assessment.	Good (2) Inventory guides planning, management decisions.	Optimal (4) Systematic comprehensive inventory system of entire urban forest – with information tailored to users and supported by mapping in municipality-wide GIS system. Provides for change analysis.	2
Assessment Methodology	**Current**	**Goal**	**Gap**
Urban forest policy and practice driven by accurate, high-resolution, and recent assessments of existing and potential canopy cover, with comprehensive goals municipality-wide and at neighborhood or smaller management level.	Better (3) Complete, detailed, and spatially explicit, high-resolution Urban Tree Canopy (UTC) assessment based on enhanced data (such as LIDAR) – accompanied by comprehensive set of goals by land use and other parameters.	Optimal (4) As described for "Better" rating – and all utilized effectively to drive urban forest and green infrastructure policy and practice municipality-wide and at neighborhood or smaller management level.	1

KNOW WHAT'S HAPPENING TO TREES IN YOUR COMMUNITY

Assessment of Publicly Owned Trees	Current	Goal	Gap
Current and detailed understanding of the condition and risk potential of all publicly owned trees that are managed intensively (or individually).	Good (2) Complete tree inventory that includes detailed tree condition ratings	Same as current.	0
Assessment of Publicly Owned Trees	**Current**	**Goal**	**Gap**
Detailed understanding of the ecological structure and function of all publicly owned natural areas (such as woodlands, ravines, stream corridors, etc.), as well as usage patterns.	Fair (1) Identified only in natural area survey.	Better (3) Ecological structure and function of all natural areas assessed and documented.	2
Assessment of Trees on Private Property	**Current**	**Goal**	**Gap**
Assessment of Trees on Private Property Understanding of extent, location, and general condition of privately owned trees across the urban forest.	Fair (1) Aerial, point-based assessment – capturing extent and location.	Optimal (4) Bottom-up sample based assessment, as well as detailed UTC analysis of entire urban forest, including private property, integrated into municipality-wide [multi-agency] GIS system. LIDAR and hyper-spectral imaging most helpful.	3

URBAN FOREST CHARACTERISTICS

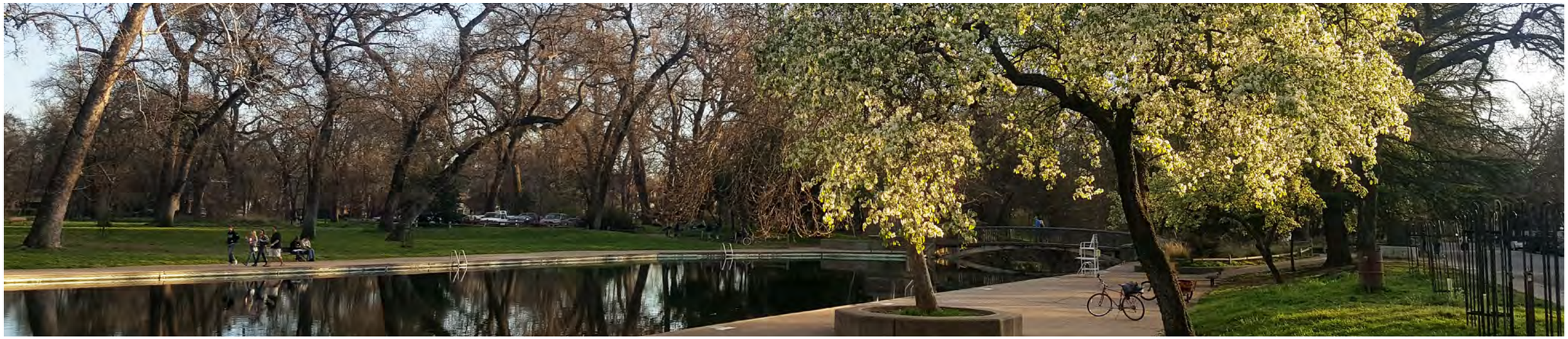
Relative Performance Index by Species	Current	Goal	Gap
Understanding the age, health and condition of publicly-owned trees, by species.	Good (2) Half of the six most common species have higher RPI scores than the average of all species in community. (>1.)	Optimal (4) All six most common species have higher RPI scores than the average of all species in community. (>1.)	2
Use of Native Vegetation	**Current**	**Goal**	**Gap**
Preservation and enhancement of local natural biodiversity.	Good (2) Use of native species is encouraged on a project-appropriate basis in all areas; invasive species are recognized and discouraged on public and private lands.	Same as Current.	0
Assessment of Trees on Private Property Understanding of extent, location, and general condition of privately owned trees across the urban forest.	Fair (1) Aerial, point-based assessment – capturing extent and location.	Optimal (4) Bottom-up sample based assessment, as well as detailed UTC analysis of entire urban forest, including private property, integrated into municipality-wide [multi-agency] GIS system. LIDAR and hyper-spectral imaging most helpful.	3

ENGAGING PEERS AND RESIDENTS IN PROCESS

Align Municipal Departments	Current	Goal	Gap
Align affected municipal departments, county and regional authorities and state agencies behind common agenda.	Fair (1) Municipal departments/agencies recognize potential conflicts and reach out to urban forest managers on an ad hoc basis – and vice versa.	Good (2) Informal teams among departments and agencies communicate regularly and collaborate on a project-specific basis.	1
All Utilities Work with Municipality, Employ BMP's	**Current**	**Goal**	**Gap**
All utilities – above and below ground – employ best management practices and cooperate with municipality to advance goals and objectives related to urban forest issues and opportunities.	Fair (1) Utilities take actions impacting urban forest with no municipal coordination.	Optimal (4) Proactive outreach and coordination efforts by municipality and NGO partners resulting in widespread citizen involvement and structured engagement among diverse neighborhood groups.	3
Environmental Equity	**Current**	**Goal**	**Gap**
Ensure that the benefits of urban forests are made available to all, especially to those in greatest need of tree benefits.	Good (2) Planting and outreach targets neighborhoods with low canopy and a high need for tree benefits.	Optimal (4) Equitable planting and outreach at the neighborhood level is guided by strong resident involvement in low canopy/high need areas. Residents participate actively in identifying needs for their neighborhoods, planning, implementation and monitoring.	2
Trees Acknowledged as Vital Community Resource	**Current**	**Goal**	**Gap**
Stakeholders from all sectors and constituencies within municipality – private and public, commercial and nonprofit, entrepreneurs and elected officials, community groups and individual citizens – understand, appreciate, and advocate for the role and importance of the urban forest as a resource.	Good (2) Trees widely acknowledged as providing environmental, social, and economic services – resulting in some action or advocacy in support of the urban forest.	Optimal (4) Urban forest recognized as vital to the community's environmental, social, and economic well-being.	2

CREATING ESSENTIAL, EFFECTIVE PUBLIC/PRIVATE PARTNERSHIPS

Engage Large Private Landowners and Institutions	Current	Goal	Gap
Large private landholders – including school systems, universities and corporate campuses – embrace and advance municipality-wide urban forest goals and objectives by implementing specific resource management plans.	Fair (1) Municipality educates landowners, provides technical assistance, sets goals and provides incentives for managing resources in accordance with plan.	Good (2) Informal teams among departments and agencies communicate regularly and collaborate on a project-specific basis.	1
All Utilities Work with Municipality, Employ BMP's	**Current**	**Goal**	**Gap**
All utilities – above and below ground – employ best management practices and cooperate with municipality to advance goals and objectives related to urban forest issues and opportunities.	Fair (1) Utilities take actions impacting urban forest with no municipal coordination.	Optimal (4) Proactive outreach and coordination efforts by municipality and NGO partners resulting in widespread citizen involvement and structured engagement among diverse neighborhood groups.	3
Green Industry Embraces Goals, High Standards	**Current**	**Goal**	**Gap**
Green industry works together to advance municipality-wide urban forest goals and objectives, and adheres to high professional standards.	Fair (1) Some cooperation among green industry as well as general awareness and acceptance of municipality-wide goals and objectives.	Optimal (4) Equitable planting and outreach at the neighborhood level is guided by strong resident involvement in low canopy/high need areas. Residents participate actively in identifying needs for their neighborhoods, planning, implementation and monitoring.	2



RESOURCE MANAGEMENT: PLANNING

Develop an Urban Forest Management Plan	Current	Goal	Gap
Develop and implement a comprehensive urban forest management plan for public and private property.	Low (-1) No urban forest management plan.	Optimal (4) New or recent urban forest and green infrastructure management plan which targets public and private tree planting and protection based on assessment of anticipated benefits – and assures these benefits are distributed equitably among neighborhoods.	5
Cooperative Planning with Other Municipalities	**Current**	**Goal**	**Gap**
Cooperation and interaction on urban forest plans among neighboring municipalities within a region, and/or with regional agencies.	Fair (1) Some neighboring municipalities and regional agencies share similar urban forest policies and plans.	Good (2) Some urban forest planning and cooperation across municipalities and regional agencies.	1
Forestry Plan Integrated Into Other Municipal Plans	**Current**	**Goal**	**Gap**
Forestry plan is designed to reinforce, and be reinforced through comprehensive plans, sustainability plans, park development, storm water and watershed plans, neighborhood revitalization, climate mitigation and sustainability plans, etc.	Low (-1) Urban forestry plan mentions how it could meet other municipal objectives, or inform other planning efforts.	Good (2) Once completed, urban forestry planning team works with other agencies to align current and future objectives.	3

RESOURCE MANAGEMENT: IMPLEMENTATION

Urban Forestry Program Capacity (Applies to In-House and Contracted Staff)	Current	Goal	Gap
Maintain sufficient well-trained personnel and equipment – whether in-house or through contracted or volunteer services – to implement municipality-wide urban forest management plan.	Fair (1) Lack of staff training and/or access to adequate equipment limits effectiveness.	Good (2) Team has capacity in terms of trained staff and equipment to achieve many of the goals of the urban forest management plan.	1
Municipality-Wide Urban Forestry Funding	**Current**	**Goal**	**Gap**
Develop and maintain adequate funding to implement municipality-wide urban forest management plan.	Fair (1) Ad hoc funding for emergency, reactive management.	Optimal (4) Sustained, long-term funding from multiple municipal, regional and/or state agencies, along with private sources to implement a comprehensive urban forest management plan, and provide for maintenance and adaptive management as circumstances change.	3
Growing Site Suitability	**Current**	**Goal**	**Gap**
All publicly owned trees are selected for each site and planted in conditions that are modified as needed to ensure survival and maximize current and future tree benefits.	Good (2) Municipality-wide guidelines for the improvement of planting site conditions and selection of suitable species.	Optimal (4) All trees planted in sites with adequate soil quality and quantity, and with sufficient growing space and overall site conditions to achieve their genetic potential and thus provide maximum ecosystem services. Where growing conditions are poor, guidance provided on how to improve soil volume, quality, other factors.	2
Tree Establishment and Maintenance	**Current**	**Goal**	**Gap**
Comprehensive and effective tree planting and establishment program is driven by canopy cover and goals and other considerations according to plan.	Fair (1) Limited planning and post-planting care. Planting takes place on plan-identified sites. None or only fragmentary planting and maintenance protocols.	Optimal (4) Comprehensive tree establishment plan provides concrete guidance on most of the following criteria: site selection, size, age class, diversity of species, native plant choice; planting protocols [e.g. minimum soil volumes, soil conditions]; young tree care, including region appropriate irrigation requirements. Includes provisions and funding for maintenance.	3

Management of Publicly-Owned Natural Areas	Current	Goal	Gap
The ecological integrity of all publicly owned natural areas is protected and enhanced – while accommodating public use where appropriate.	Fair (1) Only reactive management to facilitate public use, e.g. hazard abatement, trail maintenance.	Optimal (4) Management plan for each publicly owned natural area focused on sustaining and, where possible, improving overall ecological integrity (i.e., structure and function) – while facilitating appropriate public use.	3
Policies That Foster Good Urban Forestry on Private Lands	**Current**	**Goal**	**Gap**
Because private lands comprise the majority of canopy cover for most municipalities, plans and policies should address – through rules, fees and incentives – how owners contribute to the overall health of the urban forest and the benefits it delivers.	Fair (1) Strong tree protection ordinance focused on maintaining mature trees with effective procedures.	Optimal (4) All relevant municipal policies require or incentivize adherence by private owners to standards incorporated in the plan. Incentives and sanctions applied when appropriate.	3

RESOURCE MANAGEMENT: MONITORING AND MAINTENANCE

Tree Protection Policy and Enforcement	Current	Goal	Gap
The benefits derived from trees on public and private land are ensured by the enforcement of municipality-wide policies, including tree care "best management practices."	Good (2) Policies and practices in place to protect public trees, generally enforced. As a companion to the public tree care policy, community issues a guide to aid compliance for all affected agency staffs and contractors.	Optimal (4) Integrated municipality-wide policies and practices to protect public and private trees, consistently enforced and with penalties sufficient to deter violations.	2
Monitoring	**Current**	**Goal**	**Gap**
Periodic, cyclical inspection of urban trees to identify health, pests and disease, growth, canopy, site conditions, and potential risks. Regular inspections guide urban forest management activities, including regular maintenance, species selection, planting sites, preventative and reactive disease and pest control.	Fair (1) Monitoring is infrequent and reactive to reported changes in tree health, site condition.	Good (2) Monitoring on a regular basis with rotating schedule for each area. Monitors are professionals or volunteers trained to collect specific data required by municipality. Multi-year data available for trend analyses.	1
Tree Risk Management	**Current**	**Goal**	**Gap**
Comprehensive tree risk management program fully implemented, according to ANSI A300 (Part 10) "Tree Risk Assessment" standards, and supporting industry best management practices.	Fair (1) Citizens and city staff report tree safety issues to the forestry department or manager (e.g. 3-1-1 system, online form, etc.). System tracks the time between damage report and mitigation action.	Optimal (4) Includes "better" but with TRAQ-qualified contractors on city projects. Educate tree care companies and public about importance of TRAQ qualifications.	3
Urban Wood and Green Waste Utilization	**Current**	**Goal**	**Gap**
Create a closed system diverting all urban wood and green waste through reuse and recycling.	Fair (1) While most green waste does not go to landfill, uses are limited to chips or mulch.	Good (2) The majority of green waste is reused or recycled – for energy, products, and other purposes beyond chips or mulch.	1

APPENDIX A

i-Tree Report

i-Tree Ecosystem Analysis

City of Chico i-Tree Report

Urban Forest Effects and Values
December 2021

Summary

Understanding an urban forest's structure, function and value can promote management decisions that will improve human health and environmental quality. An assessment of the vegetation structure, function, and value of the City of Chico i-Tree Report urban forest was conducted during 2021. Data from 34855 trees located throughout City of Chico i-Tree Report were analyzed using the i-Tree Eco model developed by the U.S. Forest Service, Northern Research Station.

- Number of trees: 34,855
- Tree Cover: 303.7 acres
- Most common species of trees: Chinese pistache, California white oak, Red maple
- Percentage of trees less than 6" (15.2 cm) diameter: 34.0%
- Pollution Removal: 7.218 tons/year ($10.3 thousand/year)
- Carbon Storage: 23.45 thousand tons ($4 million)
- Carbon Sequestration: 312.8 tons ($53.4 thousand/year)
- Oxygen Production: 834.2 tons/year
- Avoided Runoff: 126.8 thousand cubic feet/year ($8.47 thousand/year)
- Building energy savings: N/A – data not collected
- Avoided carbon emissions: N/A – data not collected
- Structural values: $139 million

Ton: short ton (U.S.) (2,000 lbs)
Monetary values $ are reported in US Dollars throughout the report except where noted.
Ecosystem service estimates are reported for trees.

For an overview of i-Tree Eco methodology, see Appendix I. Data collection quality is determined by the local data collectors, over which i-Tree has no control.

Table of Contents

I. Tree Characteristics of the Urban Forest

The urban forest of City of Chico i-Tree Report has 34,855 trees with a tree cover of Chinese pistache. The three most common species are Chinese pistache (8.1 percent), California white oak (7.6 percent), and Red maple (6.6 percent).

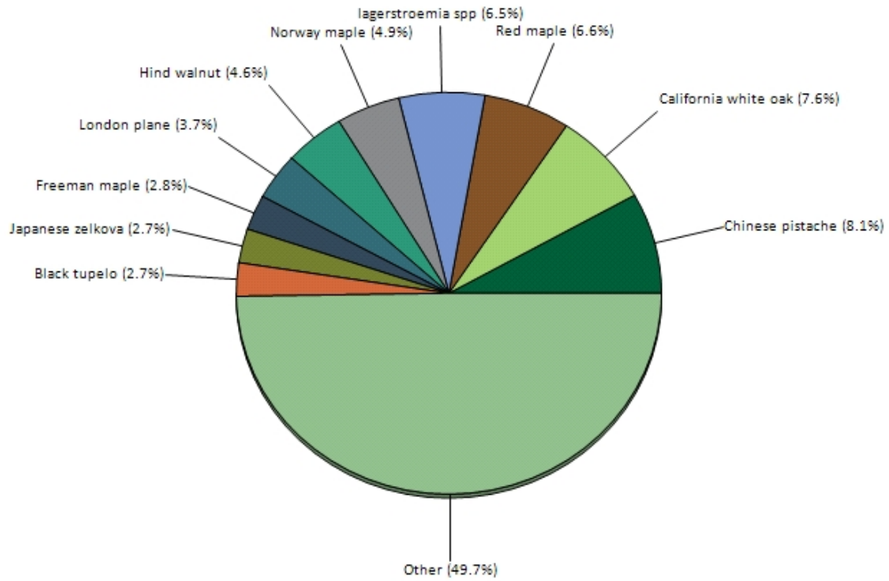


Figure 1. Tree species composition in City of Chico i-Tree Report

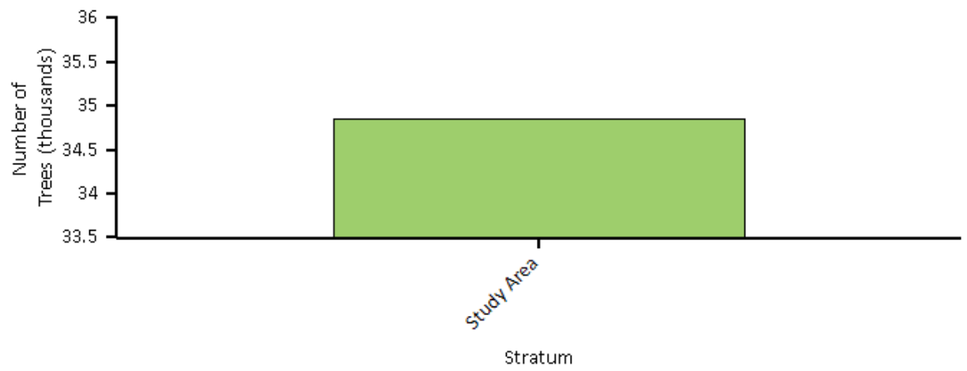


Figure 2. Number of trees in City of Chico i-Tree Report by stratum

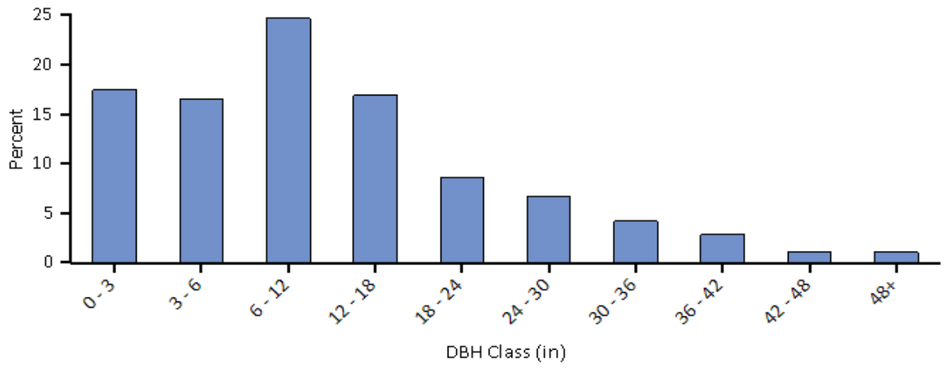


Figure 3. Percent of tree population by diameter class (DBH - stem diameter at 4.5 feet)

Urban forests are composed of a mix of native and exotic tree species. Thus, urban forests often have a tree diversity that is higher than surrounding native landscapes. Increased tree diversity can minimize the overall impact or destruction by a species-specific insect or disease, but it can also pose a risk to native plants if some of the exotic species are invasive plants that can potentially out-compete and displace native species. In City of Chico i-Tree Report, about 46 percent of the trees are species native to North America, while 17 percent are native to California. Species exotic to North America make up 54 percent of the population. Most exotic tree species have an origin from Asia (33 percent of the species).

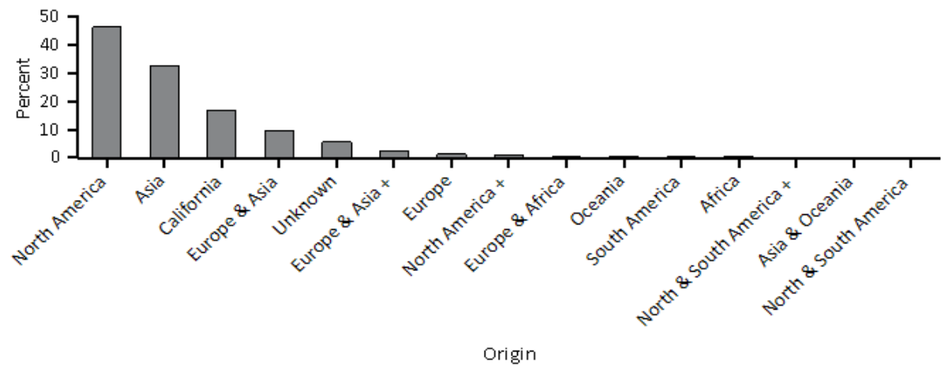


Figure 4. Percent of live tree population by area of native origin, City of Chico i-Tree Report

The plus sign (+) indicates the tree species is native to another continent other than the ones listed in the grouping.

Invasive plant species are often characterized by their vigor, ability to adapt, reproductive capacity, and general lack of natural enemies. These abilities enable them to displace native plants and make them a threat to natural areas. Four of the 305 tree species in City of Chico i-Tree Report are identified as invasive on the state invasive species list (California Invasive Species Advisory Committee 2010). These invasive species comprise 0.4 percent of the tree population though they may only cause a minimal level of impact. The three most common invasive species are Tree of heaven (0.2 percent of population), Chinese tallowtree (0.2 percent), and Blue gum eucalyptus (0.0 percent) (see Appendix V for a complete list of invasive species).

II. Urban Forest Cover and Leaf Area

Many tree benefits equate directly to the amount of healthy leaf surface area of the plant. Trees cover about 303.7 acres of City of Chico i-Tree Report and provide 1258 acres of leaf area.

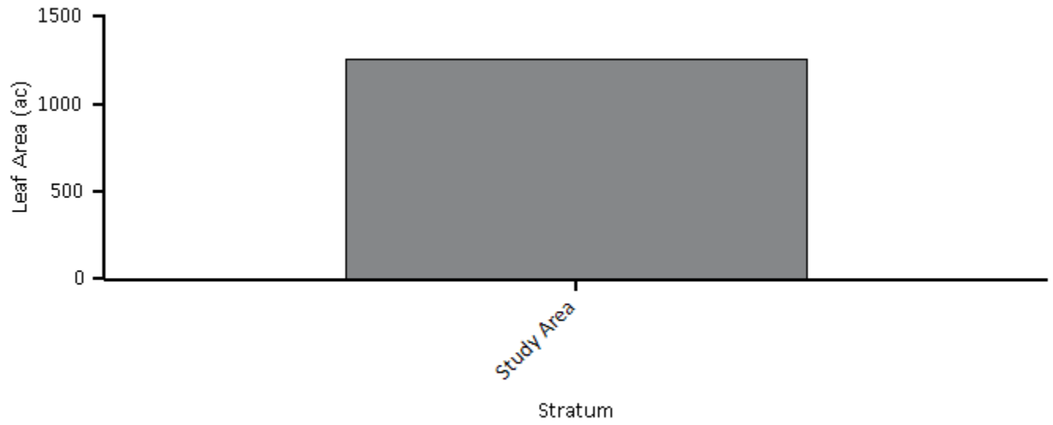


Figure 5. Leaf area by stratum, City of Chico i-Tree Report

In City of Chico i-Tree Report, the most dominant species in terms of leaf area are California white oak, London plane, and Hind walnut. The 10 species with the greatest importance values are listed in Table 1. Importance values (IV) are calculated as the sum of percent population and percent leaf area. High importance values do not mean that these trees should necessarily be encouraged in the future; rather these species currently dominate the urban forest structure.

Table 1. Most important species in City of Chico i-Tree Report

Species Name	*Percent Population*	*Percent Leaf Area*	*IV*
California white oak	7.6	14.0	21.6
London plane	3.7	9.7	13.5
Chinese pistache	8.1	4.6	12.7
Hind walnut	4.6	6.7	11.3
Red maple	6.6	1.1	7.7
lagerstroemia spp	6.5	0.6	7.2
Norway maple	4.9	2.1	7.0
Black tupelo	2.7	3.8	6.5
Chinese hackberry	2.5	3.6	6.1
Japanese zelkova	2.7	3.3	6.0

Common ground cover classes (including cover types beneath trees and shrubs) in City of Chico i-Tree Report are not available since they are configured not to be collected.

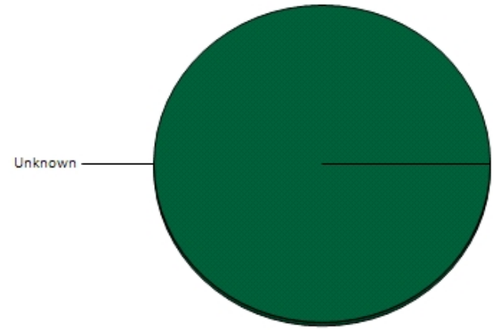


Figure 6. Percent of land by ground cover classes, City of Chico i-Tree Report

III. Air Pollution Removal by Urban Trees

Poor air quality is a common problem in many urban areas. It can lead to decreased human health, damage to landscape materials and ecosystem processes, and reduced visibility. The urban forest can help improve air quality by reducing air temperature, directly removing pollutants from the air, and reducing energy consumption in buildings, which consequently reduces air pollutant emissions from the power sources. Trees also emit volatile organic compounds that can contribute to ozone formation. However, integrative studies have revealed that an increase in tree cover leads to reduced ozone formation (Nowak and Dwyer 2000).

Pollution removal[1] by trees in City of Chico i-Tree Report was estimated using field data and recent available pollution and weather data available. Pollution removal was greatest for ozone (Figure 7). It is estimated that trees remove 7.218 tons of air pollution (ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter less than 2.5 microns (PM2.5)[2], and sulfur dioxide (SO2)) per year with an associated value of $10.3 thousand (see Appendix I for more details).

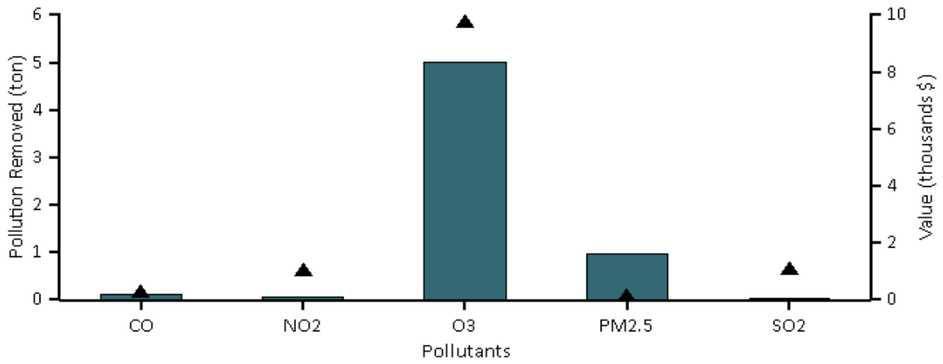


Figure 7. Annual pollution removal (points) and value (bars) by urban trees, City of Chico i-Tree Report

In 2021, trees in City of Chico i-Tree Report emitted an estimated 14.54 tons of volatile organic compounds (VOCs) (7.959 tons of isoprene and 6.58 tons of monoterpenes). Emissions vary among species based on species characteristics (e.g. some genera such as oaks are high isoprene emitters) and amount of leaf biomass. Fifty percent of the urban forest's VOC emissions were from California white oak and Shumard oak. These VOCs are precursor chemicals to ozone formation.[3]

General recommendations for improving air quality with trees are given in Appendix VIII.

[1] Particulate matter less than 10 microns is a significant air pollutant. Given that i-Tree Eco analyzes particulate matter less than 2.5 microns (PM2.5) which is a subset of PM10, PM10 has not been included in this analysis. PM2.5 is generally more relevant in discussions concerning air pollution effects on human health.

[2] Trees remove PM2.5 when particulate matter is deposited on leaf surfaces. This deposited PM2.5 can be resuspended to the atmosphere or removed during rain events and dissolved or transferred to the soil. This combination of events can lead to positive or negative pollution removal and value depending on various atmospheric factors (see Appendix I for more details).

[3] Some economic studies have estimated VOC emission costs. These costs are not included here as there is a tendency to add positive dollar estimates of ozone removal effects with negative dollar values of VOC emission effects to determine whether tree effects are positive or negative in relation to ozone. This combining of dollar values to determine tree effects should not be done, rather estimates of VOC effects on ozone formation (e.g., via photochemical models) should be conducted and directly contrasted with ozone removal by trees (i.e., ozone effects should be directly compared, not dollar estimates). In addition, air temperature reductions by trees have been shown to significantly reduce ozone concentrations (Cardelino and Chameides 1990; Nowak et al 2000), but are not considered in this analysis. Photochemical modeling that integrates tree effects on air temperature, pollution removal, VOC emissions, and emissions from power plants can be used to determine the overall effect of trees on ozone concentrations.

IV. Carbon Storage and Sequestration

Climate change is an issue of global concern. Urban trees can help mitigate climate change by sequestering atmospheric carbon (from carbon dioxide) in tissue and by altering energy use in buildings, and consequently altering carbon dioxide emissions from fossil-fuel based power sources (Abdollahi et al 2000).

Trees reduce the amount of carbon in the atmosphere by sequestering carbon in new growth every year. The amount of carbon annually sequestered is increased with the size and health of the trees. The gross sequestration of City of Chico i-Tree Report trees is about 312.8 tons of carbon per year with an associated value of $53.4 thousand. See Appendix I for more details on methods.

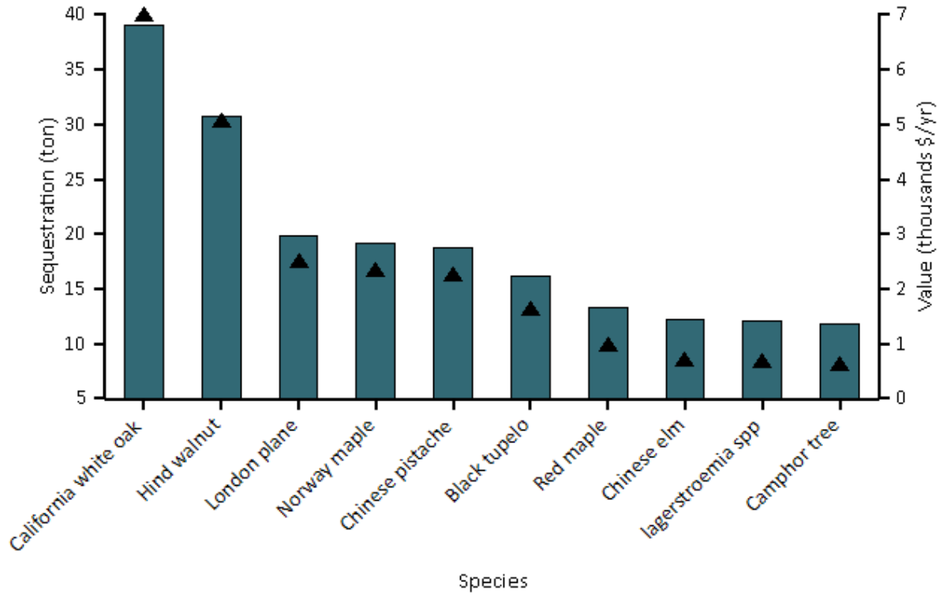


Figure 8. Estimated annual gross carbon sequestration (points) and value (bars) for urban tree species with the greatest sequestration, City of Chico i-Tree Report

Carbon storage is another way trees can influence global climate change. As a tree grows, it stores more carbon by holding it in its accumulated tissue. As a tree dies and decays, it releases much of the stored carbon back into the atmosphere. Thus, carbon storage is an indication of the amount of carbon that can be released if trees are allowed to die and decompose. Maintaining healthy trees will keep the carbon stored in trees, but tree maintenance can contribute to carbon emissions (Nowak et al 2002c). When a tree dies, using the wood in long-term wood products, to heat buildings, or to produce energy will help reduce carbon emissions from wood decomposition or from fossil-fuel or wood-based power plants.

Trees in City of Chico i-Tree Report are estimated to store 23500 tons of carbon ($4 million). Of the species sampled, Hind walnut stores the most carbon (approximately 20.4% of the total carbon stored) and California white oak sequesters the most (approximately 12.8% of all sequestered carbon.)

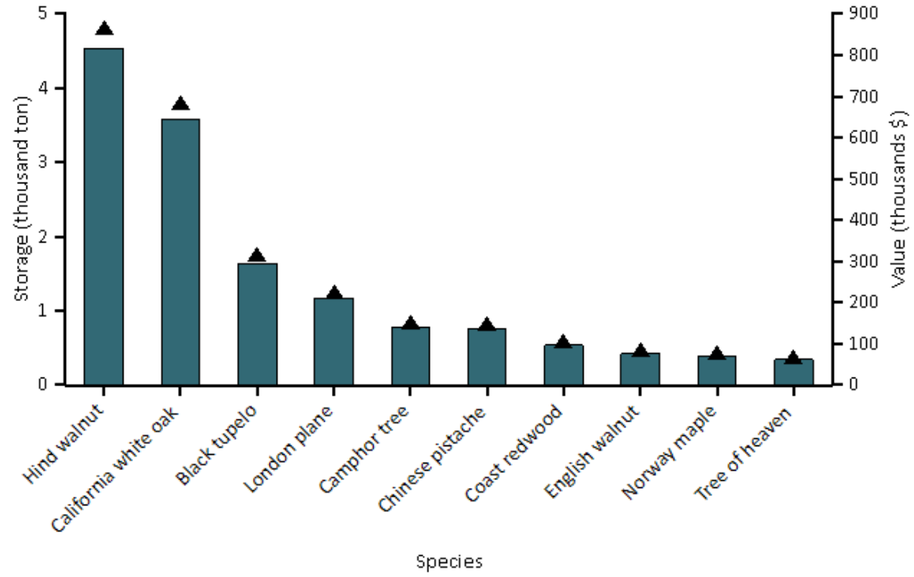


Figure 9. Estimated carbon storage (points) and values (bars) for urban tree species with the greatest storage, City of Chico i-Tree Report

V. Oxygen Production

Oxygen production is one of the most commonly cited benefits of urban trees. The annual oxygen production of a tree is directly related to the amount of carbon sequestered by the tree, which is tied to the accumulation of tree biomass.

Trees in City of Chico i-Tree Report are estimated to produce 834.2 tons of oxygen per year.[4] However, this tree benefit is relatively insignificant because of the large and relatively stable amount of oxygen in the atmosphere and extensive production by aquatic systems. Our atmosphere has an enormous reserve of oxygen. If all fossil fuel reserves, all trees, and all organic matter in soils were burned, atmospheric oxygen would only drop a few percent (Broecker 1970).

Table 2. The top 20 oxygen production species.

Species	*Oxygen (ton)*	*Gross Carbon Sequestration (ton/yr)*	*Number of Trees*	*Leaf Area (acre)*
California white oak	106.44	39.92	2,639	176.37
Hind walnut	80.69	30.26	1,607	84.01
London plane	46.26	17.35	1,302	122.58
Norway maple	44.31	16.62	1,692	26.75
Chinese pistache	43.21	16.21	2,828	57.26
Black tupelo	34.84	13.06	936	48.05
Red maple	26.06	9.77	2,297	13.97
Chinese elm	22.38	8.39	484	16.57
lagerstroemia spp	22.15	8.31	2,276	7.98
Camphor tree	21.47	8.05	341	19.69
Freeman maple	19.17	7.19	984	9.21
Coast redwood	19.14	7.18	550	36.53
Platanus x hispanica	18.62	6.98	380	26.93
Shumard oak	17.45	6.54	799	29.21
English walnut	17.11	6.42	588	22.62
Callery pear	14.69	5.51	672	13.49
Pin oak	13.90	5.21	331	24.43
Japanese zelkova	10.59	3.97	954	41.04
American sycamore	9.67	3.63	218	26.54
Silver maple	9.17	3.44	259	16.81

VI. Avoided Runoff

Surface runoff can be a cause for concern in many urban areas as it can contribute pollution to streams, wetlands, rivers, lakes, and oceans. During precipitation events, some portion of the precipitation is intercepted by vegetation (trees and shrubs) while the other portion reaches the ground. The portion of the precipitation that reaches the ground and does not infiltrate into the soil becomes surface runoff (Hirabayashi 2012). In urban areas, the large extent of impervious surfaces increases the amount of surface runoff.

Urban trees and shrubs, however, are beneficial in reducing surface runoff. Trees and shrubs intercept precipitation, while their root systems promote infiltration and storage in the soil. The trees and shrubs of City of Chico i-Tree Report help to reduce runoff by an estimated 127 thousand cubic feet a year with an associated value of $8.5 thousand (see Appendix I for more details). Avoided runoff is estimated based on local weather from the user-designated weather station. In City of Chico i-Tree Report, the total annual precipitation in 2016 was 10.5 inches.

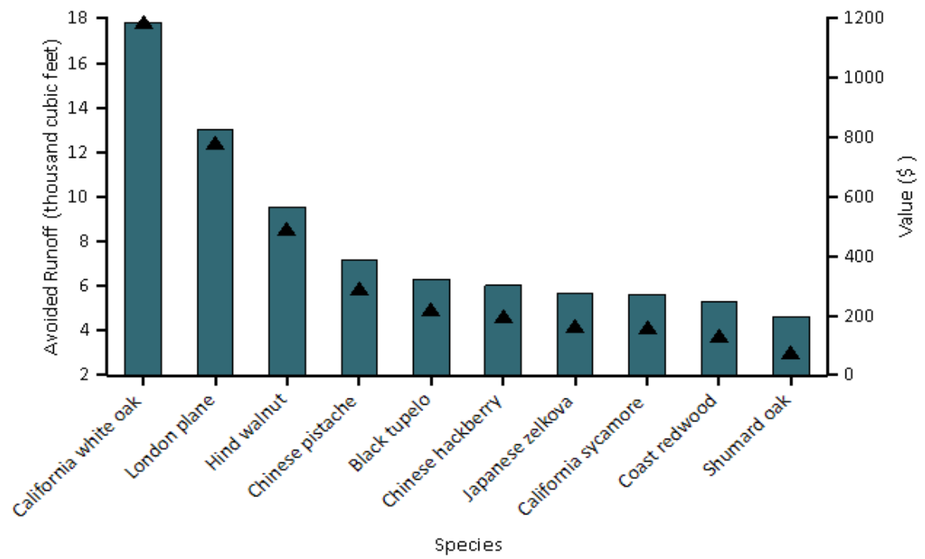


Figure 10. Avoided runoff (points) and value (bars) for species with greatest overall impact on runoff, City of Chico i-Tree Report

VII. Trees and Building Energy Use

Trees affect energy consumption by shading buildings, providing evaporative cooling, and blocking winter winds. Trees tend to reduce building energy consumption in the summer months and can either increase or decrease building energy use in the winter months, depending on the location of trees around the building. Estimates of tree effects on energy use are based on field measurements of tree distance and direction to space conditioned residential buildings (McPherson and Simpson 1999).

Because energy-related data were not collected, energy savings and carbon avoided cannot be calculated.

Table 3. Annual energy savings due to trees near residential buildings, City of Chico i-Tree Report

	Heating	*Cooling*	*Total*
MBTU[a]	0	N/A	0
MWH[b]	0	0	0
Carbon Avoided (pounds)	0	0	0

[a]MBTU - one million British Thermal Units

[b]MWH - megawatt-hour

Table 4. Annual savings [a]($) in residential energy expenditure during heating and cooling seasons, City of Chico i-Tree Report

	Heating	*Cooling*	*Total*
MBTU[b]	0	N/A	0
MWH[c]	0	0	0
Carbon Avoided	0	0	0

[b]Based on the prices of $204.7 per MWH and $12.9396400362223 per MBTU (see Appendix I for more details)

[c]MBTU - one million British Thermal Units

[c]MWH - megawatt-hour

[5] Trees modify climate, produce shade, and reduce wind speeds. Increased energy use or costs are likely due to these tree-building interactions creating a cooling effect during the winter season. For example, a tree (particularly evergreen species) located on the southern side of a residential building may produce a shading effect that causes increases in heating requirements.

VIII. Structural and Functional Values

Urban forests have a structural value based on the trees themselves (e.g., the cost of having to replace a tree with a similar tree); they also have functional values (either positive or negative) based on the functions the trees perform.

The structural value of an urban forest tends to increase with a rise in the number and size of healthy trees (Nowak et al 2002a). Annual functional values also tend to increase with increased number and size of healthy trees. Through proper management, urban forest values can be increased; however, the values and benefits also can decrease as the amount of healthy tree cover declines.

Urban trees in City of Chico i-Tree Report have the following structural values:

- Structural value: $139 million
- Carbon storage: $4 million

Urban trees in City of Chico i-Tree Report have the following annual functional values:

- Carbon sequestration: $53.4 thousand
- Avoided runoff: $8.47 thousand
- Pollution removal: $10.3 thousand
- Energy costs and carbon emission values: $0

(Note: negative value indicates increased energy cost and carbon emission value)

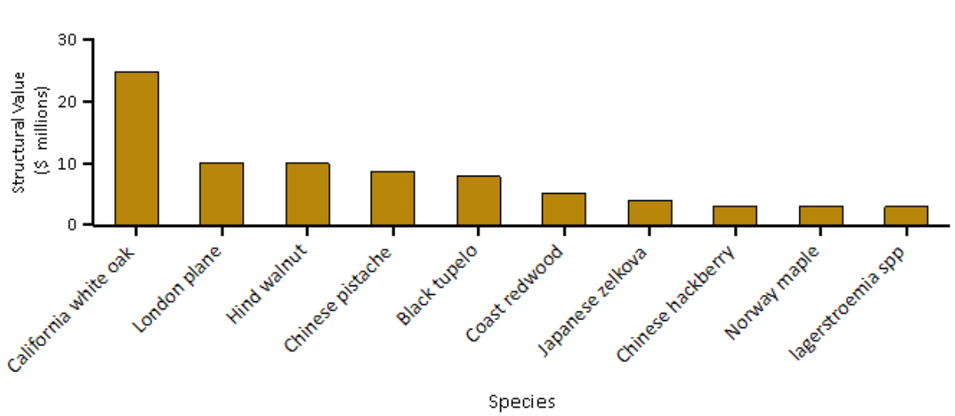


Figure 11. Tree species with the greatest structural value, City of Chico i-Tree Report

IX. Potential Pest Impacts

Various insects and diseases can infest urban forests, potentially killing trees and reducing the health, structural value and sustainability of the urban forest. As pests tend to have differing tree hosts, the potential damage or risk of each pest will differ among cities.Thirty-six pests were analyzed for their potential impact and compared with pest range maps (Forest Health Technology Enterprise Team 2014) for the conterminous United States to determine their proximity to Butte County. Eight of the thirty-six pests analyzed are located within the county. For a complete analysis of all pests, see Appendix VII.

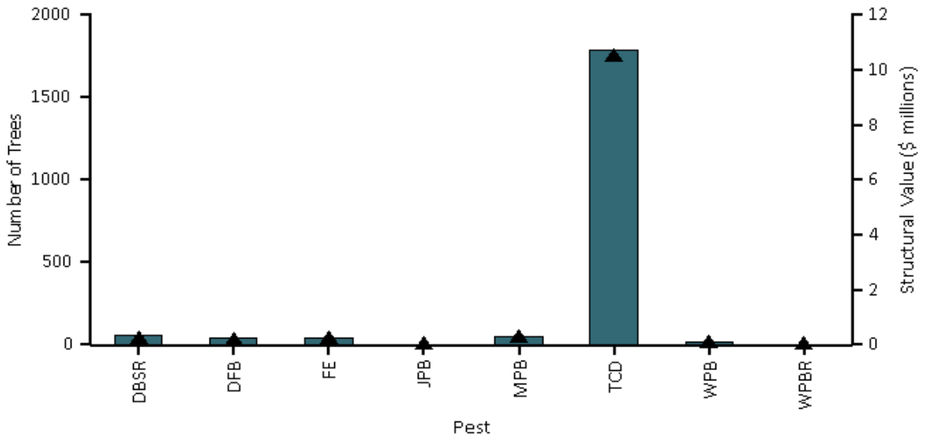


Figure 12. Number of trees at risk (points) and associated compensatory value (bars) for most threatening pests located in the county, City of Chico i-Tree Report

Douglas-fir black stain root disease (DBSR) (Hessburg et al 1995) is a variety of the black stain fungus that attacks Douglas-firs. City of Chico i-Tree Report could possibly lose 0.1 percent of its trees to this pest ($325 thousand in structural value).

Douglas-fir beetle (DFB) (Schmitz and Gibson 1996) is a bark beetle that infests Douglas-fir trees throughout the western United States, British Columbia, and Mexico. Potential loss of trees from DFB is 0.1 percent ($232 thousand in structural value).

One common pest of white fir, grand fir, and red fir trees is the fir engraver (FE) (Ferrell 1986). FE poses a threat to 0.1 percent of the City of Chico i-Tree Report urban forest, which represents a potential loss of $248 thousand in structural value.

The Jeffrey pine beetle (JPB) (Smith et al 2009) is native to North America and is distributed across California, Nevada, and Oregon where its only host, Jeffrey pine, also occurs. This pest threatens 0.0 percent of the population, which represents a potential loss of $0 in structural value.

Mountain pine beetle (MPB) (Gibson et al 2009) is a bark beetle that primarily attacks pine species in the western United States. MPB has the potential to affect 0.1 percent of the population ($315 thousand in structural value).

Thousand canker disease (TCD) (Cranshaw and Tisserat 2009; Seybold et al 2010) is an insect-disease complex that kills several species of walnuts, including black walnut. Potential loss of trees from TCD is 5.0 percent ($10.7 million in structural value).

The western pine beetle (WPB) (DeMars and Roettgering 1982) is a bark beetle and aggressive attacker of ponderosa and Coulter pines. This pest threatens 0.0 percent of the population, which represents a potential loss of $92.9 thousand in structural value.

Since its introduction to the United States in 1900, white pine blister rust (Eastern U.S.) (WPBR) (Nicholls and Anderson 1977) has had a detrimental effect on white pines, particularly in the Lake States. WPBR has the potential to affect 0.0 percent of the population ($0 in structural value).

Appendix I. i-Tree Eco Model and Field Measurements

i-Tree Eco is designed to use standardized field data and local hourly air pollution and meteorological data to quantify urban forest structure and its numerous effects (Nowak and Crane 2000), including:

- Urban forest structure (e.g., species composition, tree health, leaf area, etc.).
- Amount of pollution removed hourly by the urban forest, and its associated percent air quality improvement throughout a year.
- Total carbon stored and net carbon annually sequestered by the urban forest.
- Effects of trees on building energy use and consequent effects on carbon dioxide emissions from power sources.
- Structural value of the forest, as well as the value for air pollution removal and carbon storage and sequestration.
- Potential impact of infestations by pests, such as Asian longhorned beetle, emerald ash borer, gypsy moth, and Dutch elm disease.

Typically, all field data are collected during the leaf-on season to properly assess tree canopies. Typical data collection (actual data collection may vary depending upon the user) includes land use, ground and tree cover, individual tree attributes of species, stem diameter, height, crown width, crown canopy missing and dieback, and distance and direction to residential buildings (Nowak et al 2005; Nowak et al 2008).

During data collection, trees are identified to the most specific taxonomic classification possible. Trees that are not classified to the species level may be classified by genus (e.g., ash) or species groups (e.g., hardwood). In this report, tree species, genera, or species groups are collectively referred to as tree species.

Tree Characteristics:

Leaf area of trees was assessed using measurements of crown dimensions and percentage of crown canopy missing. In the event that these data variables were not collected, they are estimated by the model.

An analysis of invasive species is not available for studies outside of the United States. For the U.S., invasive species are identified using an invasive species list (California Invasive Species Advisory Committee 2010)for the state in which the urban forest is located. These lists are not exhaustive and they cover invasive species of varying degrees of invasiveness and distribution. In instances where a state did not have an invasive species list, a list was created based on the lists of the adjacent states. Tree species that are identified as invasive by the state invasive species list are cross-referenced with native range data. This helps eliminate species that are on the state invasive species list, but are native to the study area.

Air Pollution Removal:

Pollution removal is calculated for ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide and particulate matter less than 2.5 microns. Particulate matter less than 10 microns (PM10) is another significant air pollutant. Given that i-Tree Eco analyzes particulate matter less than 2.5 microns (PM2.5) which is a subset of PM10, PM10 has not been included in this analysis. PM2.5 is generally more relevant in discussions concerning air pollution effects on human health.

Air pollution removal estimates are derived from calculated hourly tree-canopy resistances for ozone, and sulfur and nitrogen dioxides based on a hybrid of big-leaf and multi-layer canopy deposition models (Baldocchi 1988; Baldocchi et al 1987). As the removal of carbon monoxide and particulate matter by vegetation is not directly related to transpiration, removal rates (deposition velocities) for these pollutants were based on average measured values from the literature (Bidwell and Fraser 1972; Lovett 1994) that were adjusted depending on leaf phenology and leaf area. Particulate removal incorporated a 50 percent resuspension rate of particles back to the atmosphere (Zinke 1967). Recent updates (2011) to air quality modeling are based on improved leaf area index simulations, weather and pollution processing and interpolation, and updated pollutant monetary values (Hirabayashi et al 2011; Hirabayashi et al 2012; Hirabayashi 2011).

Trees remove PM2.5 when particulate matter is deposited on leaf surfaces (Nowak et al 2013). This deposited PM2.5 can be resuspended to the atmosphere or removed during rain events and dissolved or transferred to the soil. This combination of events can lead to positive or negative pollution removal and value depending on various atmospheric factors. Generally, PM2.5 removal is positive with positive benefits. However, there are some cases when net removal is negative or resuspended particles lead to increased pollution concentrations and negative values. During some months (e.g., with no rain), trees resuspend more particles than they remove. Resuspension can also lead to increased overall PM2.5 concentrations if the boundary layer conditions are lower during net resuspension periods than during net removal periods. Since the pollution removal value is based on the change in pollution concentration, it is possible to have situations when trees remove PM2.5 but increase concentrations and thus have negative values during periods of positive overall removal. These events are not common, but can happen.

For reports in the United States, default air pollution removal value is calculated based on local incidence of adverse health effects and national median externality costs. The number of adverse health effects and associated economic value is calculated for ozone, sulfur dioxide, nitrogen dioxide, and particulate matter less than 2.5 microns using data from the U.S. Environmental Protection Agency's Environmental Benefits Mapping and Analysis Program (BenMAP) (Nowak et al 2014). The model uses a damage-function approach that is based on the local change in pollution concentration and population. National median externality costs were used to calculate the value of carbon monoxide removal (Murray et al 1994).

For international reports, user-defined local pollution values are used. For international reports that do not have local values, estimates are based on either European median externality values (van Essen et al 2011) or BenMAP regression equations (Nowak et al 2014) that incorporate user-defined population estimates. Values are then converted to local currency with user-defined exchange rates.

For this analysis, pollution removal value is calculated based on the prices of $1,327 per ton (carbon monoxide), $1,436 per ton (ozone), $184 per ton (nitrogen dioxide), $47 per ton (sulfur dioxide), $32,579 per ton (particulate matter less than 2.5 microns).

Carbon Storage and Sequestration:

Carbon storage is the amount of carbon bound up in the above-ground and below-ground parts of woody vegetation. To calculate current carbon storage, biomass for each tree was calculated using equations from the literature and measured tree data. Open-grown, maintained trees tend to have less biomass than predicted by forest-derived biomass equations (Nowak 1994). To adjust for this difference, biomass results for open-grown urban trees were multiplied by 0.8. No adjustment was made for trees found in natural stand conditions. Tree dry-weight biomass was converted to stored carbon by multiplying by 0.5.

Carbon sequestration is the removal of carbon dioxide from the air by plants. To estimate the gross amount of carbon sequestered annually, average diameter growth from the appropriate genera and diameter class and tree condition was added to the existing tree diameter (year x) to estimate tree diameter and carbon storage in year x+1.

Carbon storage and carbon sequestration values are based on estimated or customized local carbon values. For international reports that do not have local values, estimates are based on the carbon value for the United States (U.S. Environmental Protection Agency 2015, Interagency Working Group on Social Cost of Carbon 2015) and converted to local currency with user-defined exchange rates.

For this analysis, carbon storage and carbon sequestration values are calculated based on $171 per ton.

Oxygen Production:

The amount of oxygen produced is estimated from carbon sequestration based on atomic weights: net O2 release (kg/yr) = net C sequestration (kg/yr) × 32/12. To estimate the net carbon sequestration rate, the amount of carbon sequestered as a result of tree growth is reduced by the amount lost resulting from tree mortality. Thus, net carbon sequestration and net annual oxygen production of the urban forest account for decomposition (Nowak et al 2007). For complete inventory projects, oxygen production is estimated from gross carbon sequestration and does not account for decomposition.

Avoided Runoff:

Annual avoided surface runoff is calculated based on rainfall interception by vegetation, specifically the difference between annual runoff with and without vegetation. Although tree leaves, branches, and bark may intercept precipitation and thus mitigate surface runoff, only the precipitation intercepted by leaves is accounted for in this analysis.

The value of avoided runoff is based on estimated or user-defined local values. For international reports that do not have local values, the national average value for the United States is utilized and converted to local currency with user-defined exchange rates. The U.S. value of avoided runoff is based on the U.S. Forest Service's Community Tree Guide Series (McPherson et al 1999; 2000; 2001; 2002; 2003; 2004; 2006a; 2006b; 2006c; 2007; 2010; Peper et al 2009; 2010; Vargas et al 2007a; 2007b; 2008).

For this analysis, avoided runoff value is calculated based on the price of $0.07 per ft^3.

Building Energy Use:

If appropriate field data were collected, seasonal effects of trees on residential building energy use were calculated based on procedures described in the literature (McPherson and Simpson 1999) using distance and direction of trees from residential structures, tree height and tree condition data. To calculate the monetary value of energy savings, local or custom prices per MWH or MBTU are utilized.

For this analysis, energy saving value is calculated based on the prices of $204.70 per MWH and $12.94 per MBTU.

Structural Values:

Structural value is the value of a tree based on the physical resource itself (e.g., the cost of having to replace a tree with a similar tree). Structural values were based on valuation procedures of the Council of Tree and Landscape Appraisers, which uses tree species, diameter, condition, and location information (Nowak et al 2002a; 2002b). Structural value may not be included for international projects if there is insufficient local data to complete the valuation procedures.

Potential Pest Impacts:

The complete potential pest risk analysis is not available for studies outside of the United States. The number of trees at risk to the pests analyzed is reported, though the list of pests is based on known insects and disease in the United States.

For the U.S., potential pest risk is based on pest range maps and the known pest host species that are likely to experience mortality. Pest range maps for 2012 from the Forest Health Technology Enterprise Team (FHTET) (Forest Health Technology Enterprise Team 2014) were used to determine the proximity of each pest to the county in which the urban forest is located. For the county, it was established whether the insect/disease occurs within the county, is within 250 miles of the county edge, is between 250 and 750 miles away, or is greater than 750 miles away. FHTET did not have pest range maps for Dutch elm disease and chestnut blight. The range of these pests was based on known occurrence and the host range, respectively (Eastern Forest Environmental Threat Assessment Center; Worrall 2007).

Relative Tree Effects:

The relative value of tree benefits reported in Appendix II is calculated to show what carbon storage and sequestration, and air pollutant removal equate to in amounts of municipal carbon emissions, passenger automobile emissions, and house emissions.

Municipal carbon emissions are based on 2010 U.S. per capita carbon emissions (Carbon Dioxide Information Analysis Center 2010). Per capita emissions were multiplied by city population to estimate total city carbon emissions.

Light duty vehicle emission rates (g/mi) for CO, NOx, VOCs, PM10, SO2 for 2010 (Bureau of Transportation Statistics 2010; Heirigs et al 2004), PM2.5 for 2011-2015 (California Air Resources Board 2013), and CO2 for 2011 (U.S. Environmental Protection Agency 2010) were multiplied by average miles driven per vehicle in 2011 (Federal Highway Administration 2013) to determine average emissions per vehicle.

Household emissions are based on average electricity kWh usage, natural gas Btu usage, fuel oil Btu usage, kerosene Btu usage, LPG Btu usage, and wood Btu usage per household in 2009 (Energy Information Administration 2013; Energy Information Administration 2014)

- CO2, SO2, and NOx power plant emission per KWh are from Leonardo Academy 2011. CO emission per kWh assumes 1/3 of one percent of C emissions is CO based on Energy Information Administration 1994. PM10 emission per kWh from Layton 2004.
- CO2, NOx, SO2, and CO emission per Btu for natural gas, propane and butane (average used to represent LPG), Fuel #4 and #6 (average used to represent fuel oil and kerosene) from Leonardo Academy 2011.
- CO2 emissions per Btu of wood from Energy Information Administration 2014.
- CO, NOx and SOx emission per Btu based on total emissions and wood burning (tons) from (British Columbia Ministry 2005; Georgia Forestry Commission 2009).

Appendix II. Relative Tree Effects

The urban forest in City of Chico i-Tree Report provides benefits that include carbon storage and sequestration, and air pollutant removal. To estimate the relative value of these benefits, tree benefits were compared to estimates of average municipal carbon emissions, average passenger automobile emissions, and average household emissions. See Appendix I for methodology.

Carbon storage is equivalent to:

- Amount of carbon emitted in City of Chico i-Tree Report in 19 days
- Annual carbon (C) emissions from 16,600 automobiles
- Annual C emissions from 6,800 single-family houses

Carbon monoxide removal is equivalent to:

- Annual carbon monoxide emissions from 1 automobiles
- Annual carbon monoxide emissions from 4 single-family houses

Nitrogen dioxide removal is equivalent to:

- Annual nitrogen dioxide emissions from 84 automobiles
- Annual nitrogen dioxide emissions from 38 single-family houses

Sulfur dioxide removal is equivalent to:

- Annual sulfur dioxide emissions from 6,670 automobiles
- Annual sulfur dioxide emissions from 18 single-family houses

Annual carbon sequestration is equivalent to:

- Amount of carbon emitted in City of Chico i-Tree Report in 0.3 days
- Annual C emissions from 200 automobiles
- Annual C emissions from 100 single-family houses

Appendix III. Comparison of Urban Forests

A common question asked is, "How does this city compare to other cities?" Although comparison among cities should be made with caution as there are many attributes of a city that affect urban forest structure and functions, summary data are provided from other cities analyzed using the i-Tree Eco model.

I. City totals for trees

City	*% Tree Cover*	*Number of Trees*	*Carbon Storage (tons)*	*Carbon Sequestration (tons/yr)*	*Pollution Removal (tons/yr)*
Toronto, ON, Canada	26.6	10,220,000	1,221,000	51,500	2,099
Atlanta, GA	36.7	9,415,000	1,344,000	46,400	1,663
Los Angeles, CA	11.1	5,993,000	1,269,000	77,000	1,975
New York, NY	20.9	5,212,000	1,350,000	42,300	1,676
London, ON, Canada	24.7	4,376,000	396,000	13,700	408
Chicago, IL	17.2	3,585,000	716,000	25,200	888
Phoenix, AZ	9.0	3,166,000	315,000	32,800	563
Baltimore, MD	21.0	2,479,000	570,000	18,400	430
Philadelphia, PA	15.7	2,113,000	530,000	16,100	575
Washington, DC	28.6	1,928,000	525,000	16,200	418
Oakville, ON , Canada	29.1	1,908,000	147,000	6,600	190
Albuquerque, NM	14.3	1,846,000	332,000	10,600	248
Boston, MA	22.3	1,183,000	319,000	10,500	283
Syracuse, NY	26.9	1,088,000	183,000	5,900	109
Woodbridge, NJ	29.5	986,000	160,000	5,600	210
Minneapolis, MN	26.4	979,000	250,000	8,900	305
San Francisco, CA	11.9	668,000	194,000	5,100	141
Morgantown, WV	35.5	658,000	93,000	2,900	72
Moorestown, NJ	28.0	583,000	117,000	3,800	118
Hartford, CT	25.9	568,000	143,000	4,300	58
Jersey City, NJ	11.5	136,000	21,000	890	41
Casper, WY	8.9	123,000	37,000	1,200	37
Freehold, NJ	34.4	48,000	20,000	540	22

II. Totals per acre of land area

City	*Number of Trees/ac*	*Carbon Storage (tons/ac)*	*Carbon Sequestration (tons/ac/yr)*	*Pollution Removal (lb/ac/yr)*
Toronto, ON, Canada	64.9	7.8	0.33	26.7
Atlanta, GA	111.6	15.9	0.55	39.4
Los Angeles, CA	19.6	4.2	0.16	13.1
New York, NY	26.4	6.8	0.21	17.0
London, ON, Canada	75.1	6.8	0.24	14.0
Chicago, IL	24.2	4.8	0.17	12.0
Phoenix, AZ	12.9	1.3	0.13	4.6
Baltimore, MD	48.0	11.1	0.36	16.6
Philadelphia, PA	25.1	6.3	0.19	13.6
Washington, DC	49.0	13.3	0.41	21.2
Oakville, ON , Canada	78.1	6.0	0.27	11.0
Albuquerque, NM	21.8	3.9	0.12	5.9
Boston, MA	33.5	9.1	0.30	16.1
Syracuse, NY	67.7	10.3	0.34	13.6
Woodbridge, NJ	66.5	10.8	0.38	28.4
Minneapolis, MN	26.2	6.7	0.24	16.3
San Francisco, CA	22.5	6.6	0.17	9.5
Morgantown, WV	119.2	16.8	0.52	26.0
Moorestown, NJ	62.1	12.4	0.40	25.1
Hartford, CT	50.4	12.7	0.38	10.2
Jersey City, NJ	14.4	2.2	0.09	8.6
Casper, WY	9.1	2.8	0.09	5.5
Freehold, NJ	38.3	16.0	0.44	35.3

Appendix IV. General Recommendations for Air Quality Improvement

Urban vegetation can directly and indirectly affect local and regional air quality by altering the urban atmosphere environment. Four main ways that urban trees affect air quality are (Nowak 1995):

- Temperature reduction and other microclimate effects
- Removal of air pollutants
- Emission of volatile organic compounds (VOC) and tree maintenance emissions
- Energy effects on buildings

The cumulative and interactive effects of trees on climate, pollution removal, and VOC and power plant emissions determine the impact of trees on air pollution. Cumulative studies involving urban tree impacts on ozone have revealed that increased urban canopy cover, particularly with low VOC emitting species, leads to reduced ozone concentrations in cities (Nowak 2000). Local urban management decisions also can help improve air quality.

Urban forest management strategies to help improve air quality include (Nowak 2000):

Strategy	*Result*
Increase the number of healthy trees	Increase pollution removal
Sustain existing tree cover	Maintain pollution removal levels
Maximize use of low VOC-emitting trees	Reduces ozone and carbon monoxide formation
Sustain large, healthy trees	Large trees have greatest per-tree effects
Use long-lived trees	Reduce long-term pollutant emissions from planting and removal
Use low maintenance trees	Reduce pollutants emissions from maintenance activities
Reduce fossil fuel use in maintaining vegetation	Reduce pollutant emissions
Plant trees in energy conserving locations	Reduce pollutant emissions from power plants
Plant trees to shade parked cars	Reduce vehicular VOC emissions
Supply ample water to vegetation	Enhance pollution removal and temperature reduction
Plant trees in polluted or heavily populated areas	Maximizes tree air quality benefits
Avoid pollutant-sensitive species	Improve tree health
Utilize evergreen trees for particulate matter	Year-round removal of particles

Appendix V. Invasive Species of the Urban Forest

The following inventoried tree species were listed as invasive on the California invasive species list (California Invasive Species Advisory Committee 2010):

Species Name[a]	*Number of Trees*	*% of Trees*	*Leaf Area (ac)*	*Percent Leaf Area*
Tree of heaven	84	0.2	10.1	0.8
Chinese tallowtree	55	0.2	1.7	0.1
Blue gum eucalyptus	9	0.0	0.7	0.1
California peppertree	1	0.0	0.0	0.0
Total	**149**	**0.43**	**12.47**	**0.99**

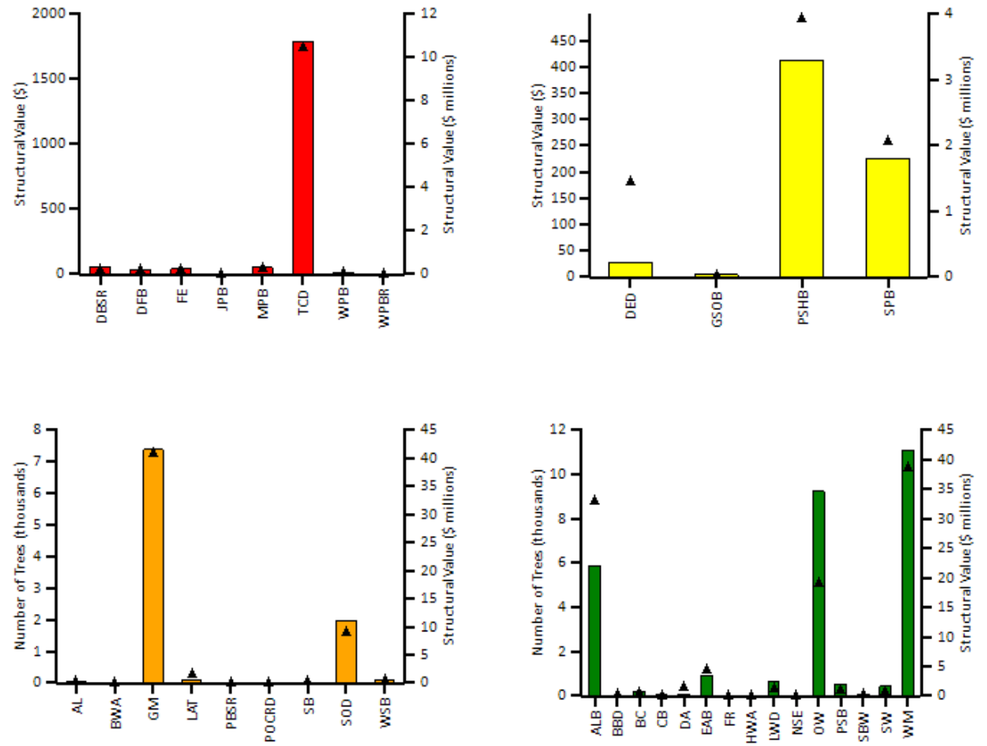
[a]Species are determined to be invasive if they are listed on the state's invasive species list

Appendix VI. Potential Risk of Pests

Thirty-six insects and diseases were analyzed to quantify their potential impact on the urban forest. As each insect/ disease is likely to attack different host tree species, the implications for {0} will vary. The number of trees at risk reflects only the known host species that are likely to experience mortality.

Code	Scientific Name	Common Name	Trees at Risk (#)	Value ($ millions)
AL	Phyllocnistis populiella	Aspen Leafminer	63	0.17
ALB	Anoplophora glabripennis	Asian Longhorned Beetle	8,785	22.06
BBD	Neonectria faginata	Beech Bark Disease	34	0.04
BC	Sirococcus clavigignenti juglandacearum	Butternut Canker	139	0.72
BWA	Adelges piceae	Balsam Woolly Adelgid	1	0.02
CB	Cryphonectria parasitica	Chestnut Blight	25	0.13
DA	Discula destructiva	Dogwood Anthracnose	399	0.34
DBSR	Leptographium wageneri var. pseudotsugae	Douglas-fir Black Stain Root Disease	36	0.33
DED	Ophiostoma novo-ulmi	Dutch Elm Disease	182	0.22
DFB	Dendroctonus pseudotsugae	Douglas-Fir Beetle	28	0.23
EAB	Agrilus planipennis	Emerald Ash Borer	1,198	3.48
FE	Scolytus ventralis	Fir Engraver	29	0.25
FR	Cronartium quercuum f. sp. Fusiforme	Fusiform Rust	6	0.03
GM	Lymantria dispar	Gypsy Moth	7,247	41.57
GSOB	Agrilus auroguttatus	Goldspotted Oak Borer	4	0.04
HWA	Adelges tsugae	Hemlock Woolly Adelgid	0	0.00
JPB	Dendroctonus jeffreyi	Jeffrey Pine Beetle	0	0.00
LAT	Choristoneura conflictana	Large Aspen Tortrix	277	0.55
LWD	Raffaelea lauricola	Laurel Wilt	354	2.48
MPB	Dendroctonus ponderosae	Mountain Pine Beetle	42	0.31
NSE	Ips perturbatus	Northern Spruce Engraver	10	0.01
OW	Ceratocystis fagacearum	Oak Wilt	5,075	34.62
PBSR	Leptographium wageneri var. ponderosum	Pine Black Stain Root Disease	8	0.09
POCRD	Phytophthora lateralis	Port-Orford-Cedar Root Disease	6	0.04
PSB	Tomicus piniperda	Pine Shoot Beetle	255	1.95
PSHB	Euwallacea nov. sp.	Polyphagous Shot Hole Borer	491	3.30
SB	Dendroctonus rufipennis	Spruce Beetle	33	0.09
SBW	Choristoneura fumiferana	Spruce Budworm	58	0.32
SOD	Phytophthora ramorum	Sudden Oak Death	1,587	11.08
SPB	Dendroctonus frontalis	Southern Pine Beetle	257	1.80
SW	Sirex noctilio	Sirex Wood Wasp	224	1.71
TCD	Geosmithia morbida	Thousand Canker Disease	1,747	10.73
WM	Operophtera brumata	Winter Moth	10,325	41.57
WPB	Dendroctonus brevicomis	Western Pine Beetle	8	0.09
WPBR	Cronartium ribicola	White Pine Blister Rust	0	0.00
WSB	Choristoneura occidentalis	Western Spruce Budworm	98	0.62

In the following graph, the pests are color coded according to the county's proximity to the pest occurrence in the United States. Red indicates that the pest is within the county; orange indicates that the pest is within 250 miles of the county; yellow indicates that the pest is within 750 miles of the county; and green indicates that the pest is outside of these ranges.



Note: points - Number of trees, bars - Structural value

Based on the host tree species for each pest and the current range of the pest (Forest Health Technology Enterprise Team 2014), it is possible to determine what the risk is that each tree species in the urban forest could be attacked by an insect or disease.

Spp. Risk	Risk Weight	Species Name	AL	ALB	BBD	BC	BWA	CB	DA	DBSR	DED	DFB	EAB	FE	FR	GM	GSOB	HWA	JPB	LAT	LWD	MPB	NSE	OW	PBSR	POCRD	PSB	PSHB	SB	SBW	SOD	SPB	SW	TCD	WM	WPB	WPBR	WSB
	22	Ponderosa pine																																				
	20	Douglas fir																																				
	11	Scots pine																																				
	11	Quaking aspen																																				
	10	willow spp																																				
	10	Weeping willow																																				
	10	White spruce																																				
	10	Coastal live oak																																				
	10	California black oak																																				
	10	White fir																																				
	9	Blue spruce																																				
	8	Pin oak																																				
	8	Northern red oak																																				
	8	River birch																																				
	8	Paper birch																																				
	8	Pinyon pine																																				
	7	Camphor tree																																				
	7	European white birch																																				
	7	Holly oak																																				
	7	Boxelder																																				
	7	plum spp																																				
	6	English oak																																				
	6	cottonwood spp																																				
	6	Pacific madrone																																				
	6	spruce spp																																				
	5	California white oak																																				
	5	Shumard oak																																				
	5	Shingle oak																																				
	5	Black walnut																																				
	5	Interior live oak																																				
	5	Bur oak																																				
	5	Scarlet oak																																				
	5	Willow oak																																				
	5	Water oak																																				
	5	Blue oak																																				
	5	White alder																																				

Spp. Risk	Risk Weight	Species Name	AL	ALB	BBD	BC	BWA	CB	DA	DBSR	DED	DFB	EAB	FE	FR	GM	GSOB	HWA	JPB	LAT	LWD	MPB	NSE	OW	PBSR	POCRD	PSB	PSHB	SB	SBW	SOD	SPB	SW	TCD	WM	WPB	WPBR	WSB
	5	Northern pin oak																																				
	5	Silver leaf oak																																				
	5	Turkey oak																																				
	5	Live oak																																				
	5	Laurel oak																																				
	5	Loblolly pine																																				
	5	Pitch pine																																				
	5	oak spp																																				
	5	White oak																																				
	5	Chinkapin oak																																				
	4	Hind walnut																																				
	4	Chinese elm																																				
	4	Sawtooth oak																																				
	4	Cork oak																																				
	4	Japanese pine																																				
	4	European beech																																				
	4	Aleppo pine																																				
	4	pine spp																																				
	4	Italian stone pine																																				
	4	Canary island pine																																				
	4	Pacific dogwood																																				
	4	Washington hawthorn																																				
	4	Siberian elm																																				
	4	California buckeye																																				
	4	California laurel																																				
	4	apple spp																																				
	4	Austrian pine																																				
	4	Asian white birch																																				
	4	Monterey pine																																				
	4	Red pine																																				
	4	pear spp																																				
	4	American basswood																																				
	4	American elm																																				
	4	Horse chestnut																																				
	4	Japanese red pine																																				
	4	European ash																																				
	4	Southern crabapple																																				
	4	White poplar																																				

Spp. Risk	Risk Weight	Species Name	AL	ALB	BBD	BC	BWA	CB	DA	DBSR	DED	DFB	EAB	FE	FR	GM	GSOB	HWA	JPB	LAT	LWD	MPB	NSE	OW	PBSR	POCRD	PSB	PSHB	SB	SBW	SOD	SPB	SW	TCD	WM	WPB	WPBR	WSB
	4	Black poplar																																					
	4	Southern California walnut																																					
	4	Afghan pine																																					
	4	Sycamore maple																																					
	3	Callery pear																																					
	3	Coast redwood																																					
	3	elm spp																																					
	3	Green ash																																					
	3	Littleleaf linden																																					
	3	Evergreen pear																																					
	3	Japanese flower crabapple																																					
	3	European crabapple																																					
	3	'Bradford' callery pear																																					
	3	Bay laurel																																					
	3	Sweetgum																																					
	3	Cuperlin																																					
	3	Apricot																																					
	3	hawthorn spp																																					
	3	Bigleaf linden																																					
	3	Smooth hawthorn																																					
	3	Port orford cedar																																					
	3	Smoke tree																																					
	3	Toyon																																					
	3	Italian alder																																					
	3	'Aristocrat' callery pear																																					
	3	Black hawthorn																																					
	3	Eastern hophornbeam																																					
	3	Hinoki cypress																																					
	3	English elm																																					
	3	California peppertree																																					
	3	Eleyi crapapple																																					
	3	alder spp																																					
	3	camellia spp																																					
	3	hazelnut spp																																					
	3	Silver dollar eucalyptus																																					
	3	Avocado																																					

Spp. Risk	Risk Weight	Species Name	AL	ALB	BBD	BC	BWA	CB	DA	DBSR	DED	DFB	EAB	FE	FR	GM	GSOB	HWA	JPB	LAT	LWD	MPB	NSE	OW	PBSR	POCRD	PSB	PSHB	SB	SBW	SOD	SPB	SW	TCD	WM	WPB	WPBR	WSB
	2	Red maple																																					
	2	Norway maple																																					
	2	White ash																																					
	2	California sycamore																																					
	2	Bigtooth maple																																					
	2	Silver maple																																					
	2	Sugar maple																																					
	2	Velvet ash																																					
	2	Oregon ash																																					
	2	Rocky mountain maple																																					
	2	Black maple																																					
	1	London plane																																					
	1	Freeman maple																																					
	1	Narrow-leafed ash																																					
	1	October glory red maple																																					
	1	Flowering dogwood																																					
	1	Trident maple																																					
	1	Japanese maple																																					
	1	Modesto ash																																					
	1	Kousa dogwood																																					
	1	Purple blow maple																																					
	1	Persian silk tree																																					
	1	Peach																																					
	1	dogwood spp																																					
	1	Northern hackberry																																					
	1	Common plum																																					
	1	Sweet cherry																																					
	1	American chestnut																																					
	1	ash spp																																					
	1	Fremont cottonwood																																					
	1	Red horsechestnut																																					
	1	Summit ash																																					
	1	Amur maple																																					
	1	Columnar maple																																					
	1	Schwedleri norway maple																																					

Spp. Risk	Risk Weight	Species Name	AL	ALB	BBD	BC	BWA	CB	DA	DBSR	DED	DFB	EAB	FE	FR	GM	GSOB	HWA	JPB	LAT	LWD	MPB	NSE	OW	PBSR	POCRD	PSB	PSHB	SB	SBW	SOD	SPB	SW	TCD	WM	WPB	WPBR	WSB
	1	Paperbark maple																																				
	1	Rose-of-sharon																																				
	1	Crimson king norway maple																																				
	1	American plum																																				
	1	Tatar maple																																				
	1	Black cherry																																				
	1	Alternateleaf dogwood																																				
	1	Shamel ash																																				
	1	Caucasian ash																																				
	1	maple spp																																				
	1	Pin cherry																																				
	1	Hedge maple																																				

Note:
Species that are not listed in the matrix are not known to be hosts to any of the pests analyzed.

Species Risk:

- Red indicates that tree species is at risk to at least one pest within county
- Orange indicates that tree species has no risk to pests in county, but has a risk to at least one pest within 250 miles from the county
- Yellow indicates that tree species has no risk to pests within 250 miles of county, but has a risk to at least one pest that is 250 and 750 miles from the county
- Green indicates that tree species has no risk to pests within 750 miles of county, but has a risk to at least one pest that is greater than 750 miles from the county

Risk Weight:
Numerical scoring system based on sum of points assigned to pest risks for species. Each pest that could attack tree species is scored as 4 points if red, 3 points if orange, 2 points if yellow and 1 point if green.

Pest Color Codes:

- Red indicates pest is within Butte county
- Red indicates pest is within 250 miles county
- Yellow indicates pest is within 750 miles of Butte county
- Green indicates pest is outside of these ranges

References

Abdollahi, K.K.; Ning, Z.H.; Appeaning, A., eds. 2000. Global climate change and the urban forest. Baton Rouge, LA: GCRCC and Franklin Press. 77 p.

Baldocchi, D. 1988. A multi-layer model for estimating sulfur dioxide deposition to a deciduous oak forest canopy. Atmospheric Environment. 22: 869-884.

Baldocchi, D.D.; Hicks, B.B.; Camara, P. 1987. A canopy stomatal resistance model for gaseous deposition to vegetated surfaces. Atmospheric Environment. 21: 91-101.

Bidwell, R.G.S.; Fraser, D.E. 1972. Carbon monoxide uptake and metabolism by leaves. Canadian Journal of Botany. 50: 1435-1439.

British Columbia Ministry of Water, Land, and Air Protection. 2005. Residential wood burning emissions in British Columbia. British Columbia.

Broecker, W.S. 1970. Man's oxygen reserve. Science 168(3939): 1537-1538.

Bureau of Transportation Statistics. 2010. Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel. Washington, DC: Burea of Transportation Statistics, U.S. Department of Transportation. Table 4-43.

California Air Resources Board. 2013. Methods to Find the Cost-Effectiveness of Funding Air Quality Projects. Table 3 Average Auto Emission Factors. CA: California Environmental Protection Agency, Air Resources Board.

California Invasive Species Advisory Committee. 2010. The California Invasive Species List. CA: Invasive Species Council of California. <http://www.iscc.ca.gov/docs/CaliforniaInvasiveSpeciesList.pdf>

Carbon Dioxide Information Analysis Center. 2010. CO2 Emissions (metric tons per capita). Washington, DC: The World Bank.

Cardelino, C.A.; Chameides, W.L. 1990. Natural hydrocarbons, urbanization, and urban ozone. Journal of Geophysical Research. 95(D9): 13,971-13,979.

Cranshaw, W.; Tisserat, N. 2009. Walnut twig beetle and the thousand cankers disease of black walnut. Pest Alert. Ft. Collins, CO: Colorado State University.

Seybold, S.; Haugen, D.; Graves, A. 2010. Thousand Cankers Disease. Pest Alert. NA-PR-02-10. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry.

DeMars, C. J., Jr.; Roettgering, B. H. 1982. Western Pine Beetle. Forest Insect & Disease Leaflet 1. Washington, DC: U.S. Department of Agriculture, Forest Service. 8 p.

Eastern Forest Environmental Threat Assessment Center. Dutch Elm Disease. http://threatsummary.forestthreats.org/threats/threatSummaryViewer.cfm?threatID=43

Energy Information Administration. 1994. Energy Use and Carbon Emissions: Non-OECD Countries. Washington, DC: Energy Information Administration, U.S. Department of Energy.

Energy Information Administration. 2013. CE2.1 Fuel consumption totals and averages, U.S. homes. Washington, DC:

Energy Information Administration, U.S. Department of Energy.

Energy Information Administration. 2014. CE5.2 Household wood consumption. Washington, DC: Energy Information Administration, U.S. Department of Energy.

Federal Highway Administration. 2013. Highway Statistics 2011.Washington, DC: Federal Highway Administration, U.S. Department of Transportation. Table VM-1.

Ferrell, G. T. 1986. Fir Engraver. Forest Insect & Disease Leaflet 13. Washington, DC: U. S. Department of Agriculture, Forest Service. 8 p.

Forest Health Technology Enterprise Team. 2014. 2012 National Insect & Disease Risk Maps/Data. Fort Collins, CO: U.S. Department of Agriculture, Forest Service. http://www.fs.fed.us/foresthealth/technology/nidrm2012.shtml

Georgia Forestry Commission. 2009. Biomass Energy Conversion for Electricity and Pellets Worksheet. Dry Branch, GA: Georgia Forestry Commission.

Gibson, K.; Kegley, S.; Bentz, B. 2009. Mountain Pine Beetle. Forest Insect & Disease Leaflet 2. Washington, DC: U. S. Department of Agriculture, Forest Service. 12 p.

Heirigs, P.L.; Delaney, S.S.; Dulla, R.G. 2004. Evaluation of MOBILE Models: MOBILE6.1 (PM), MOBILE6.2 (Toxics), and MOBILE6/CNG. Sacramento, CA: National Cooperative Highway Research Program, Transportation Research Board.

Hessburg, P. F.; Goheen, D. J.; Bega, R.V. 1995. Black Stain Root Disease of Conifers. Forest Insect & Disease Leaflet 145. Washington, DC: U.S. Department of Agriculture, Forest Service.

Hirabayashi, S. 2011. Urban Forest Effects-Dry Deposition (UFORE-D) Model Enhancements, http://www.itreetools.org/eco/resources/UFORE-D enhancements.pdf

Hirabayashi, S. 2012. i-Tree Eco Precipitation Interception Model Descriptions, http://www.itreetools.org/eco/resources/iTree_Eco_Precipitation_Interception_Model_Descriptions_V1_2.pdf

Hirabayashi, S.; Kroll, C.; Nowak, D. 2011. Component-based development and sensitivity analyses of an air pollutant dry deposition model. Environmental Modeling and Software. 26(6): 804-816.

Hirabayashi, S.; Kroll, C.; Nowak, D. 2012. i-Tree Eco Dry Deposition Model Descriptions V 1.0

Interagency Working Group on Social Cost of Carbon, United States Government. 2015. Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866. http://www.whitehouse.gov/sites/default/files/omb/inforeg/scc-tsd-final-july-2015.pdf

Layton, M. 2004. 2005 Electricity Environmental Performance Report: Electricity Generation and Air Emissions. CA: California Energy Commission.

Leonardo Academy. 2011. Leonardo Academy's Guide to Calculating Emissions Including Emission Factors and Energy Prices. Madison, WI: Leonardo Academy Inc.

Lovett, G.M. 1994. Atmospheric deposition of nutrients and pollutants in North America: an ecological perspective. Ecological Applications. 4: 629-650.

McPherson, E.G.; Maco, S.E.; Simpson, J.R.; Peper, P.J.; Xiao, Q.; VanDerZanden, A.M.; Bell, N. 2002. Western Washington and Oregon Community Tree Guide: Benefits, Costs, and Strategic Planting. International Society of Arboriculture, Pacific Northwest, Silverton, OR.

McPherson, E.G.; Simpson, J.R. 1999. Carbon dioxide reduction through urban forestry: guidelines for professional and volunteer tree planters. Gen. Tech. Rep. PSW-171. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 237 p.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Crowell, A.M.N.; Xiao, Q. 2010. Northern California coast community tree guide: benefits, costs, and strategic planting. PSW-GTR-228. Gen. Tech. Rep. PSW-GTR-228. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, CA.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Gardner, S.L.; Vargas, K.E.; Maco, S.E.; Xiao, Q. 2006a. Coastal Plain Community Tree Guide: Benefits, Costs, and Strategic Planting PSW-GTR-201. USDA Forest Service, Pacific Southwest Research Station, Albany, CA.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Gardner, S.L.; Vargas, K.E.; Xiao, Q. 2007. Northeast community tree guide: benefits, costs, and strategic planting.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Maco, S.E.; Gardner, S.L.; Cozad, S.K.; Xiao, Q. 2006b. Midwest Community Tree Guide: Benefits, Costs and Strategic Planting PSW-GTR-199. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, CA.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Maco, S.E.; Gardner, S.L.; Vargas, K.E.; Xiao, Q. 2006c. Piedmont Community Tree Guide: Benefits, Costs, and Strategic Planting PSW-GTR 200. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, CA.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Maco, S.E.; Xiao Q.; Mulrean, E. 2004. Desert Southwest Community Tree Guide: Benefits, Costs and Strategic Planting. Phoenix, AZ: Arizona Community Tree Council, Inc. 81 :81.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Scott, K.I.; Xiao, Q. 2000. Tree Guidelines for Coastal Southern California Communities. Local Government Commission, Sacramento, CA.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Xiao, Q. 1999. Tree Guidelines for San Joaquin Valley Communities. Local Government Commission, Sacramento, CA.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Xiao, Q.; Maco, S.E.; Hoefer, P.J. 2003. Northern Mountain and Prairie Community Tree Guide: Benefits, Costs and Strategic Planting. Center for Urban Forest Research, USDA Forest Service, Pacific Southwest Research Station, Albany, CA.

McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Xiao, Q.; Pittenger, D.R.; Hodel, D.R. 2001. Tree Guidelines for Inland Empire Communities. Local Government Commission, Sacramento, CA.

Murray, F.J.; Marsh L.; Bradford, P.A. 1994. New York State Energy Plan, vol. II: issue reports. Albany, NY: New York State Energy Office.

National Invasive Species Information Center. 2011. Beltsville, MD: U.S. Department of Agriculture, National Invasive Species Information Center. http://www.invasivespeciesinfo.gov/plants/main.shtml

Nicholls, T. H.; Anderson, R. L. 1977. How to Identify White Pine Blister Rust and Remove Cankers. St. Paul, MN: U.S. Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry

Nowak, D.J. 1994. Atmospheric carbon dioxide reduction by Chicago's urban forest. In: McPherson, E.G.; Nowak, D.J.; Rowntree, R.A., eds. Chicago's urban forest ecosystem: results of the Chicago Urban Forest Climate Project. Gen. Tech. Rep. NE-186. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station: 83-94.

Nowak, D.J. 1995. Trees pollute? A "TREE" explains it all. In: Proceedings of the 7th National Urban Forestry Conference. Washington, DC: American Forests: 28-30.

Nowak, D.J. 2000. The interactions between urban forests and global climate change. In: Abdollahi, K.K.; Ning, Z.H.; Appeaning, A., eds. Global Climate Change and the Urban Forest. Baton Rouge, LA: GCRCC and Franklin Press: 31-44.

Nowak, D.J., Hirabayashi, S., Bodine, A., Greenfield, E. 2014. Tree and forest effects on air quality and human health in the United States. Environmental Pollution. 193:119-129.

Nowak, D.J., Hirabayashi, S., Bodine, A., Hoehn, R. 2013. Modeled PM2.5 removal by trees in ten U.S. cities and associated health effects. Environmental Pollution. 178: 395-402.

Nowak, D.J.; Civerolo, K.L.; Rao, S.T.; Sistla, S.; Luley, C.J.; Crane, D.E. 2000. A modeling study of the impact of urban trees on ozone. Atmospheric Environment. 34: 1601-1613.

Nowak, D.J.; Crane, D.E. 2000. The Urban Forest Effects (UFORE) Model: quantifying urban forest structure and functions. In: Hansen, M.; Burk, T., eds. Integrated tools for natural resources inventories in the 21st century. Proceedings of IUFRO conference. Gen. Tech. Rep. NC-212. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station: 714-720.

Nowak, D.J.; Crane, D.E.; Dwyer, J.F. 2002a. Compensatory value of urban trees in the United States. Journal of Arboriculture. 28(4): 194 - 199.

Nowak, D.J.; Crane, D.E.; Stevens, J.C.; Hoehn, R.E. 2005. The urban forest effects (UFORE) model: field data collection manual. V1b. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station, 34 p. http://www.fs.fed.us/ne/syracuse/Tools/downloads/UFORE_Manual.pdf

Nowak, D.J.; Crane, D.E.; Stevens, J.C.; Ibarra, M. 2002b. Brooklyn's urban forest. Gen. Tech. Rep. NE-290. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 107 p.

Nowak, D.J.; Dwyer, J.F. 2000. Understanding the benefits and costs of urban forest ecosystems. In: Kuser, John, ed. Handbook of urban and community forestry in the northeast. New York, NY: Kluwer Academics/Plenum: 11-22.

Nowak, D.J.; Hoehn, R.; Crane, D. 2007. Oxygen production by urban trees in the United States. Arboriculture & Urban Forestry. 33(3):220-226.

Nowak, D.J.; Hoehn, R.E.; Crane, D.E.; Stevens, J.C.; Walton, J.T; Bond, J. 2008. A ground-based method of assessing urban forest structure and ecosystem services. Arboriculture and Urban Forestry. 34(6): 347-358.

Nowak, D.J.; Stevens, J.C.; Sisinni, S.M.; Luley, C.J. 2002c. Effects of urban tree management and species selection on atmospheric carbon dioxide. Journal of Arboriculture. 28(3): 113-122.

Peper, P.J.; McPherson, E.G.; Simpson, J.R.; Albers, S.N.; Xiao, Q. 2010. Central Florida community tree guide: benefits, costs, and strategic planting. Gen. Tech. Rep. PSW-GTR-230. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, CA.

Peper, P.J.; McPherson, E.G.; Simpson, J.R.; Vargas, K.E.; Xiao Q. 2009. Lower Midwest community tree guide: benefits, costs, and strategic planting. PSW-GTR-219. Gen. Tech. Rep. PSW-GTR-219. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, CA.

Schmitz, R. F.; Gibson, K. E. 1996. Douglas-fir Beetle. Forest Insect & Disease Leaflet 5. R1-96-87. Washington,DC: U. S. Department of Agriculture, Forest Service. 8 p.

Smith, S. L.; Borys, R. R.; Shea, P. J. 2009. Jeffrey Pine Beetle. Forest Insect & Disease Leaflet 11. Washington, DC: U. S. Department of Agriculture, Forest Service. 8 p.

U.S. Environmental Protection Agency. 2010. Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards. Washington, DC: U.S. Environmental Protection Agency. EPA-420-R-10-012a

U.S. Environmental Protection Agency. 2015. The social cost of carbon. http://www.epa.gov/climatechange/EPAactivities/economics/scc.html

van Essen, H.; Schroten, A.; Otten, M.; Sutter, D.; Schreyer, C.; Zandonella, R.; Maibach, M.; Doll, C. 2011. External Costs of Transport in Europe. Netherlands: CE Delft. 161 p.

Vargas, K.E.; McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Gardner, S.L.; Xiao, Q. 2007a. Interior West Tree Guide.

Vargas, K.E.; McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Gardner, S.L.; Xiao, Q. 2007b. Temperate Interior West Community Tree Guide: Benefits, Costs, and Strategic Planting.

Vargas, K.E.; McPherson, E.G.; Simpson, J.R.; Peper, P.J.; Gardner, S.L.; Xiao, Q. 2008. Tropical community tree guide: benefits, costs, and strategic planting. PSW-GTR-216. Gen. Tech. Rep. PSW-GTR-216. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, CA.

Worrall, J.J. 2007. Chestnut Blight. Forest and Shade Tree Pathology. http://www.forestpathology.org/dis_chestnut.html

Zinke, P.J. 1967. Forest interception studies in the United States. In: Sopper, W.E.; Lull, H.W., eds. Forest Hydrology. Oxford, UK: Pergamon Press: 137-161.

APPENDIX B

Urban Forest Summit Results

Urban Forest Summit

July 31, 2021, 10am-1pm, Arc Pavilion

59 attendees, 36 volunteer hours

Attendee demographics

Category	Demographics of Attendees		U.S. Census Bureau Demographics of the City of Chico	
Age	60 or older	48%	65 or older	13%
Housing Type	Single family home	79.5%	Single family home	60.6%
Housing Status	Homeowner	70.5%	Homeowner	44.7%
Race	White	81.8%	White	70.6%
Education	Bachelor's degree or higher	70.5%	Bachelor's degree or higher	37.4%
Ethnicity	Hispanic, Latino/a/x	13.6%	Hispanic, Latino/a/x	18.4%

Post-it Activity

What do you love about Chico's Trees?	What should improve about Chico's Trees?	What do you hope for the future of Chico's trees?
• Shade and cooling • Habitat for wildlife • Diversity • Beauty • Fall colors • Maturity and size • Environmental and health benefits • Iconic to Chico's history	• More funding • More education for community members • Improved tree maintenance • Collaboration with utility companies • Improved planning and development • Improved maintenance • Increased tree planting in specific locations • Species selection	• More trees in specific areas • Better aligned planning and development • More healthy, larger trees • More native trees • More edible trees • More climate-adapted species

What do you love about Chico's trees

Shade
- Shade (10)*
- Cooler temperatures (4)

Habitat for wildlife
- Habitat (7)
- Birds (5)
- Wildlife (6)
- Insects
- Life (2)

Diversity/Beauty/Color/Size
- Aesthetics (3)
- Biodiversity (5)
- Autumn colors (5)
- Beauty (3)
- Love the old asymmetric walnut trees
- A tall canopy
- Mature and established (5)

*If answers were repeated by participants, the number of times it was stated is listed in parenthesis. 1

Environmental & health benefits

- Cleaner air (5)
- Oxygen production (2)
- Reduced soil erosion
- Mental Health and Well-being (2)
- Carbon sequestration
- Captures rainwater
- Absorbs carbon dioxide
- Make cars drive slower, by driving through more pleasant areas

History

- Legacy
- You see chico's history in a glance
- Connection to the past

What should improve about Chico's trees

Funding and education

- Sustainable funding for public mix of street tree and front yard trees
- Every grade school grade should donate and plant a tree at their school. It ties in well with science curriculum and is an example of community stewardship
- Educate ourselves about the Tuscan water district and articial recharge
- More public education on tree biology, species selection, growth rate, soils

Increased environmental considerations

- Protect the water in our shallow acquifier
- I think urban trees should be valued as part of urban ecosystems and regarded as habitat for wildlife
- Shade vs solar energy. Is there a balance?

Collaboration with utility companies

- Engage and monitor plans proposed by the Butte County Water Department
- PG&E needs to plant more trees than they remove. They do nothing right now
- Avoid destructive pruning around powerlines. Move the lines instead
- Add EIS category for shade in 10+ line set backs. Need trees for energy conservation

Improved planning and development

- We need the planning commission to plant big planting strips on streets (5)
- Planning starts with the environment—not how much money can be made on each development (3)
- Increased trees in parking lots, at least 50% shade (2)
- Are developers given a list of trees best suited for parking lots?
- All developments should be required to have trees that shade street parking
- More street trees in housing developments (2)
- Require and enforce permitting to remove trees on private property
- Less pavement (eg. decreased parking lot requirements and increased plantable surface) (2)

Maintenance

- Create a system of maintenance for trees' health (8)
- Maintenance of old trees along wires (Vallombrosa/park)
- Hire full time city arborist and tree maintenance crew (2)
- We have too few juvenile trees
- Formative pruning of young trees
- Start planting juvenile trees now and not only when a tree dies
- Better tree replacement considerations (2)
- Sustain uneven age
- Multiheight canopy
- Don't plant trees in medians that die in concrete. Not good!

Increased trees in specific locations

- We should have more trees in parking lots (3)
- Plant more trees at schools
- Plant more trees on the south side of streets
- Plant more trees in concrete dominated areas (3)
- Add to the new homeless camp
- More along streets and in suburban neighborhoods
- Planting of trees in new development areas
- More space for trunk growth for trees in sidewalks
- Bike trails lined with trees

Species selection

- I want to see more trees giving canopy shade east of town center (32) and in commercial centers
- Replant black walnut replacement trees
- Maintain healthy valley oaks
- More natives that provide habitat and drought tolerant (7)
- Tripping on roots from lifted sidewalks...plant trees that don't do that
- They continue to be valued, nurtured, and planted
- Plant more trees, plentify and abundant
- More and bigger! (2)
- Diverse tree types (2)
- More sycamores
- Better species selection so that they thrive (2)
- Phase out trash/unsavory species or species that don't fit (2)
- Publicly accessible edible species (3)
- No Chinese pistache!

What do you hope for the future of Chico's trees?

More trees in specific areas

- More trees in sunny areas where shade is needed
- Plant more oaks near the new animal shelter location
- Shaded parking lots
- Shaded avenues for walkers (3)
- Create a larger wildlife corridor
- 100% full shade on streets
- Large trees on private property become "neighborhood trees" to guarantee forest continuity for all.
- Restore parks, greways, street cooridoes
- Greener schools
- I hope the city trees continue to revitalize degraded lands and promote agriculture to help reduce carbon and greenhouse emissions
- Equity

Better aligned planning and development

- Prioritized in new development. Small lots can not safely hold large trees. New development should have mandatory areas for trees to grow into maturity.
- Parking lots over 50% shaded and actually enforced (4)
- Plant more trees particularly in parking lots
- Planning begins with environment including trees. Arborist tree map and evaluation before developing a design
- Design stormwater rain garden integration into parking lots/street plantings
- An encompassing plan that agencies and property owners agree to create stewardship
- Summer is getting more intense. Chico needs to fund more tree maintenance/planting if we want the city to be livable in 20 years
- Improve ordinances/code to create greener developments
- More variety in future development. Developers monocrop too often

More healthy, larger trees

- Taking care of champion trees
- Take better care of what we've got. Don't plant more
- City assistance with heritage tree on private property
- Best pruning practices
- Planting of correct size of trees for the space
- More! Bigger!
- That their health is a priority for the city of trees
- Space to allow to grow to maturity. Old trees drop big limbs. They need space to avoid the chainsaw.
- Love the tall street trees (sycamores, redwoods, cedars), even though they might not be native.
- Protect aquifer so more tree roots can reach water.
- Select trees that will thrive where they are planted. Too many stunted trees.

Native trees

- Large native oaks should have municipal protection (legally) that reflects their ecological/aesthetic/historic value. They enrich our city.
- More native trees are planted (4)
- Recognizing awesome trees
- Restoration of the urban forest with native plants

Edible trees

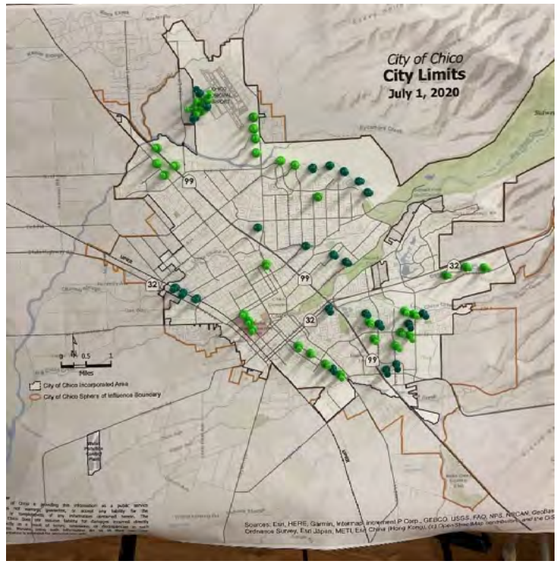
- Edible landscaping provides food
- Free fruit (food forests)
- More edibles. Legistlate nuts/fruits for food resiliency

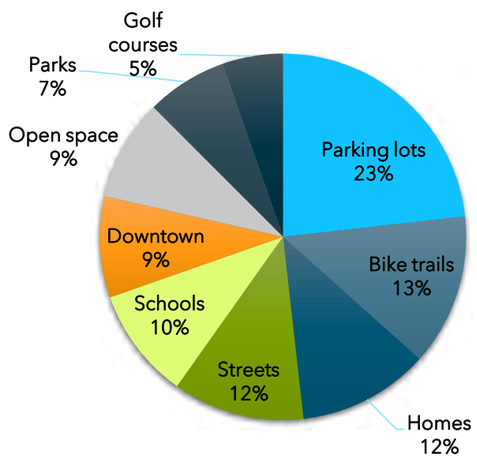
Climate adapted species

- More drought tolerant species (6)
- We hope there is enough water in Butte County to keep trees irrigated and thriving
- Survival as the climate warms
- Do not plant invasive species like tree of heaven
- A way to require solar without discouraging planting trees
- Inform homewoners about how to care for their street trees (i.e. do they need to be watered during a drought)
- More self sustaining Mediterranean trees, not just natives. More groves.

Where Should the City Plant More Trees?

Attendees placed a push pin where they would like to see more trees.





DUDEK

Developing a Vision Statement

The vision statement of Chico's urban forest is developed with input from the City of Chico, the Urban Forest Master Plan Working Group, and the Urban Forest Summit attendees. Below is the input from the Urban Forest Summit attendees.

Category	Responses
Phrases to describe the ideal Chico urban forest	- Sustainable - Well managed - Formative pruning/longevity - Best management practices - Diversity of species - Lots of shade - Management of older trees/when to phase them out - Recognition/protection/preservation of old trees - Wildlife habitat - Access for children - Sufficient funding - 80% urban tree canopy on double lane roads - Don't plant more trees than can be managed -
Benefits from trees	- Link between established urban forest and groundwater/sustainable groundwater - Planning for the changing climate -
Values of Chico living	- Create more global sense of ownership and education about the UF - More education - Urban forest and fire safety/defensible space - Affordability of maintenance to allow residents to maintain their trees - Improve ordinance to increase shade in parking lots -

Proposed Vision Statement:

Our urban forest will be a resilient network of trees and understory vegetation that is sustainably managed through responsible stewardship by the City and residents, provides equitable social, economic and ecosystem benefits to all residents and wildlife, and reflects Chico's identity and legacy as the City of Trees using traditional ecological knowledge as a base.

Group Idea Generation Results

Engage How do we get more residents involved in the urban forest	Preserve How do we help preserve the existing urban forest?	Grow Where/how can we get more trees planted on non-City owned land
○ Improved marketing/outreach campaigns ○ Public education campaigns ○ Citizen science programs ○ Focus on climate change	○ Protecting existing trees in developed areas ○ Protecting existing trees in undeveloped space and during construction ○ Protecting trees in general ○ Increased education	○ Host events and contests to incentivize tree planting ○ Protect private trees ○ Improved development and planning ○ Proper planting and establishment care ○ Increased education ○ Appropriate enforcement of ordinances ○ Plant trees in specific locations

Engage: How do we get more residents involved in the urban forest?

Improved marketing/outreach campaigns

- QR code for survey in various places
  - Cafes
  - Laundromats
  - Co-op
  - Parks/on trees
  - Little free libraries
  - Tables at community events
  - Bars
  - Tree themed drinks at bars
  - High schools
  - College
  - Grade schools
  - Facebook groups
  - Rental facebook groups
- Door knock in areas underrepresented in survey resules or are in need of more trees
- Focus group sessions at apartment complexes
- Offer incentives for participation
- Partner with Sunrise Redding
- Offer tree tours to community members
- Community-centered outreach to students, renters
  - Specific, focused on neighborhoods/cooridors
- Talk to community organizations to access their audiences
  - Arts
  - Biking groups
  - Unions

- Flyers in break rooms of fast food places, doctor's offices, employers of all types
- Talk to agricultural groups like Ducks Unlimited
- Rebates for getting rid of lawns and keeping trees
- Engage schools, churches, tribers
- Start volunteer groups
  - Over all we need to make sure people can guarantee their trees will be maintained in the future.
- City contracts with landscaping and tree companies
  - Incentivize eco-friendly practices
  - Educate private home landscapers
  - Incentivize landscapers and arborists to use BMPs/less watering
- Talk to Nord complexes about HWY 32 trees

Public education campaigns

- Education of public about the importance of biodiversity
  - Workshops through CARD, Chico Creek Nature Center
  - Classroom education
- Educate on medicinal and nutrituional values of all trees and plants
- Emphasize household economic benefits in education
- Education on how to maintain parkway strip trees
  - Residents are responsible for watering young trees, but some don't know this
- "Sponsor a Tree" program to give people some "ownership" if not on their property. Similar to "Adopt a Highway" program

Citizen Science

- Free bird houses and bad boxes for renters
- Pick locations that can be used for fruit trees that could have volunteers monitor the seasonality of the specific fruit

Climate Change Focus

- Emphasize economic benefits of planting on private land, especially households
  - Energy savings
  - Shade
  - Soil cover
- Broaden focus to emphasize importance of regional ecological and climate impacts
  - People need to know why they should care

Protect: How do we help preserve the existing urban forest?

Protecting Existing trees in developed areas

- Remove roadside parking space to reroute sidewalk around large trees lifting sidewalks.
- Incentivize existing parking lot owners to expand islands
- Collect seeds from existing heritage trees to cultivate and pass on strong genetics

- Identify trees at the end of their life cycle and ensure that there are trees established to take their place prior to removal
- Incentivize and require permeable walkway/parking lot installation during construction upgrades
- When it is possible, remove targets under mature trees to reduce risk

Protecting Existing trees in undeveloped space and during construction

- Require root protection zones around trees
- Tunnel under rather than trench through major roots
- Require healthy trees to be integrated into designs
- Require healthy stands of trees to be left as open space or built into landscapes during large developments
- Create financial incentives for building plans that preserve existing trees, and provide good environments to plant new trees
- Eliminate some roadside parking in new developments to allow for large tree planting sites that will not lift sidewalk in the future
- Identify site conditions and require plant material that can thrive in those conditions
- Create property assessments specifically for tree care prior to subdivision of land developments. Do not make Tree Department compete with Police and Fire for funds
- Mandate natural neighborhood parks in new large developments that allow for trees to grow without risk of striking targets. Use California Park walking trails and open spaces as an example.

Protecting trees in general

- Determine a tiering system to categorize trees and their level of importance.
- Nominate more Heritage trees
- Provide money and equipment to property owners to protect trees during droughts
- Create Municipal pruning standards that tree contractors INCLUDING utility contractors must abide by
- Require utility companies to give notice to property owners regarding line clearance
- Enforce and fine violators of tree ordinance. Harsher penalties for large developers that may see fines as a cost of doing business
- Allow neighborhood organizations to establish tree standards for their neighborhood.
- Invite arborists to schools to educate our youth and allow them to help with proper tree planting
- Expand city tree crew

Education

- Educate city planners and developers on tree health, allow Urban Forester more input on future development
- Create easy to use public access web site on Chico as a tree city that will have useful and educational information on the following using layperson terms and easy to understand concepts
    - Proper tree selection based on soil, yard size, purpose of tree, water conditions etc.
    - Formative tree pruning basics to allow tree owners to correct flaws in growth while trees are in a juvenile stage

DUDEK

    - List of vetted arborists
    - Tips for tree friendly landscaping practices- Normalize mulching, keeping leaves under dripline to reduce compaction, drip irrigation, pairing landscape plants and trees that have like needs, etc.
    - Contact information for local garden clubs
    - Volunteer opportunities to assist with urban forest enhancement
    - Lists of undesirable and invasive trees to avoid
    - List of medicinal, edible, and wildlife sustaining trees
    - List of endemic trees and their growth condition
    - List of trees suitable for a Mediterranean climate
    - Education for trees and rooftop solar to coexist

Grow: Where/how can we get more trees planted on non-City owned land?

Host events and contests to incentivize tree planting

- Free tree give-away events, with advisors to provide recommendations on placement, species, etc.
- Contests for best lawn replacement attempts (like the way people do for Christmas light displays)
- Rebates for trees that serve as pollinator plants
- Look at other cities where there are successful programs
- Get the land owner to donate removal of asphalf in exchange for getting a free tree
- Team with more non-profits such as CA Native Plant Society, Altacal Audubon, Service groups
- Community outreach and education, mass advertisements
- Tree planting events and seed starter clubs
- Free tree planting coupon iven to every property sold

Protect private trees

- Expand cmc 16.66 to protect all private trees
- Plant trees on private property and incentivize residents by providing tax credits for their contribution towards the $6.6 Million in environmental benefits
- Are developers given a list of trees best suited for parking lots? Or % canopy required for parking lots?

Improved development and planning

- Developer fees to maintain trees—not just plant but maintain as well!
- Consider effects of solar panels, ie don't remove trees for solar!

Proper planting

- Ensure the success of planting by only planting between October-February
- Trees provided where bike paths pass businesses so that bikers can stop at the store

Education

- Classroom volunteers to teach kids value of trees, and plant at the school or someone's home
- Educate residents about the importance o trees, passive solar, drought tolerance, habitat
- Neighborhood worksops and free tree give-aways

Enforcement

- Require that all shopping center/parking lots plant larger trees and maintain them
- A tree island in parking lots for ever 10 proposed parking spaces. All islands required to have trees
- Trees in parking lots where electric charges are going to be installed. Cars take about an hour to charge, and batteries need to stay cool.
- Require wide sidewalk planter strips for street trees in all new developments
- Hold developers accountale to agreed upon tree/green space
- City ordinances/permitting requirements for businesses with large parking lots to plant shade trees
- Require homeowners to allow ciy tree plantings in the front yards if they do not have planter strips
- Penalize corporations that have large parking lots ith little or no shade
- Enforcement of existing laws

Locations

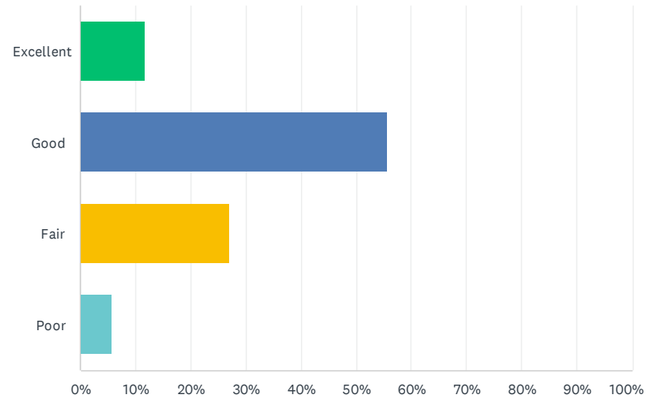
- On private propery so that home owners will buy into the urban forest and maintain them
- Parking lots (kmart, etc.)
- Mangrove Ave business owners
- North Esplanade business owners
- On church properties/in their parking lots so that members will uy into the urban forest and maintain them
- South Chico industrial areas (park, Fair, E. Park/Skyway)
- Along major roads to serve as major noise mitigation
- Use newly planted trees on school property as a living classroom with new curriculum
- Convince schools to plant trees around the perimeter of their fields

APPENDIX C

Online Survey Results

Q1 What rating would you give the health and appearance of public space street trees in Chico? Public space street trees are defined as trees in the right-of-way, in parks, and other publicly owned land.

Answered: 315 Skipped: 1

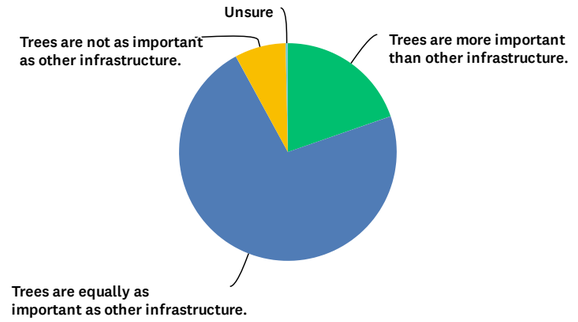


ANSWER CHOICES	RESPONSES	
Excellent	11.75%	37
Good	55.56%	175
Fair	26.98%	85
Poor	5.71%	18
TOTAL		315

City of Chico Urban Forest Master Plan Survey

Q2 Trees are considered part of the City's infrastructure. How important do you think trees are compared to other infrastructure like streets, sidewalks, water, sewer, traffic signals, lighting, etc.?

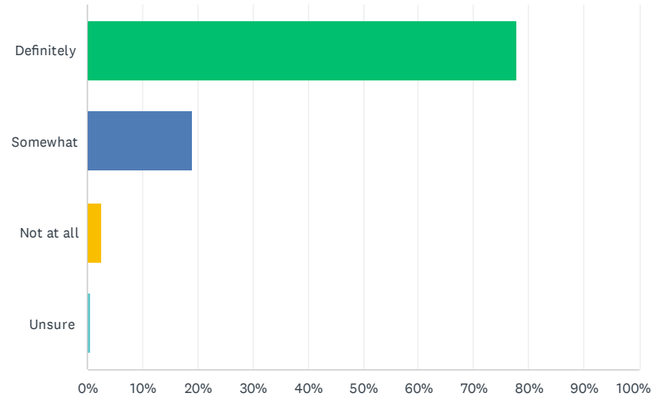
Answered: 315 Skipped: 1



ANSWER CHOICES	RESPONSES	
Trees are more important than other infrastructure.	19.68%	62
Trees are equally as important as other infrastructure.	72.38%	228
Trees are not as important as other infrastructure.	7.62%	24
Unsure	0.32%	1
TOTAL		315

Q3 I consider my neighborhood street trees a valuable community asset that contributes to my quality of life in Chico.

Answered: 316 Skipped: 0

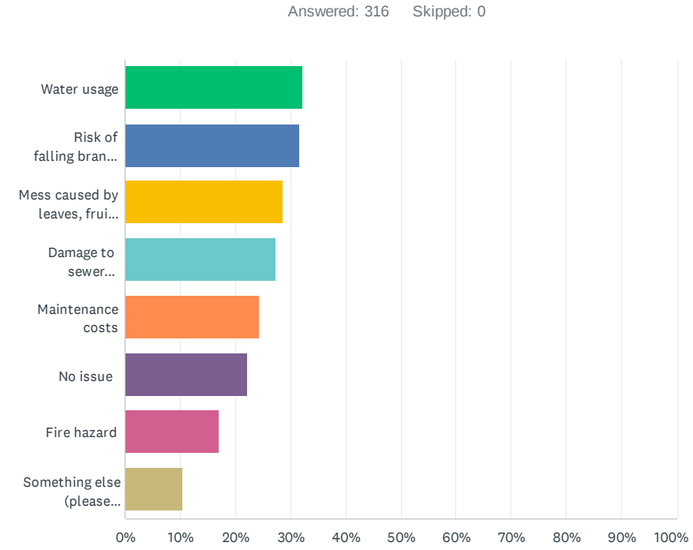


ANSWER CHOICES	RESPONSES	
Definitely	77.85%	246
Somewhat	18.99%	60
Not at all	2.53%	8
Unsure	0.63%	2
TOTAL		316

City of Chico Urban Forest Master Plan Survey

Q4 Select the option that best represents the main concerns you have about growing and/or maintaining trees on your property. Check all that apply.

Answered: 316 Skipped: 0



ANSWER CHOICES	RESPONSES	
Water usage	32.28%	102
Risk of falling branch damage	31.65%	100
Mess caused by leaves, fruit, and bark drop	28.48%	90
Damage to sewer pipes/sidewalks	27.22%	86
Maintenance costs	24.37%	77
No issue	22.15%	70
Fire hazard	17.09%	54
Something else (please specify)	10.44%	33
Total Respondents: 316		

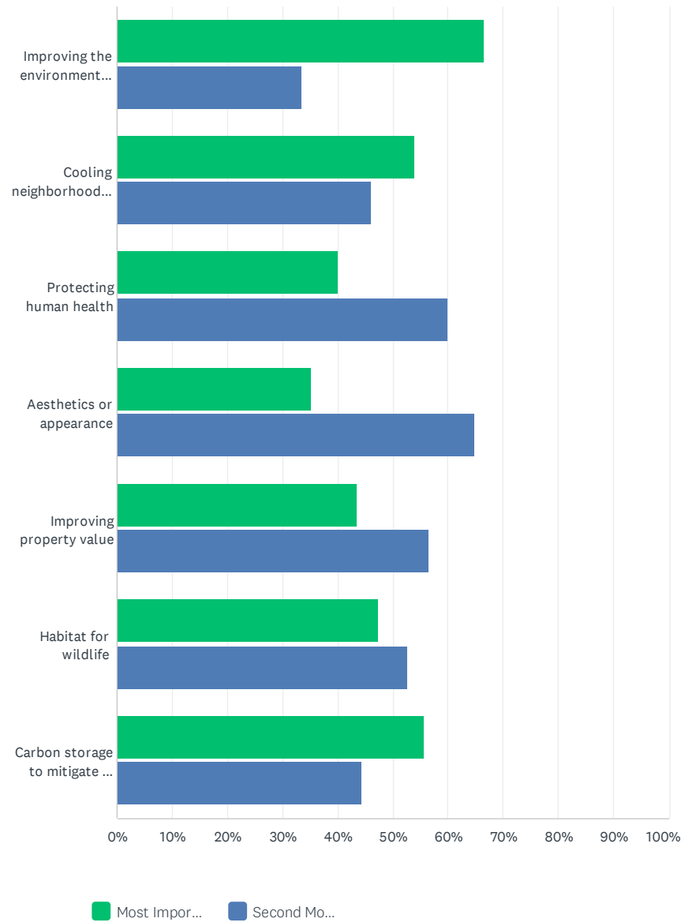
#	SOMETHING ELSE (PLEASE SPECIFY)	DATE
1	Tree health	4/10/2022 4:49 AM
2	Dead tree removal/replacement Floral Ave	3/29/2022 6:22 PM

3	This last storm cause my pistachio tree to break in half. It need to be taken down. Looking for a good tree for the area and is drought tolerant.	11/13/2021 6:35 PM
4	Dead/ dying because of disease/ pests	10/6/2021 4:59 PM
5	Damage to my house by large untrimmed branches of overhanging street trees	9/10/2021 5:31 PM
6	The trees on Cal Park Dr. are in very poor repair. The water runs off the median where they are and runs across the street. At the corner of Cal Park and Alameda Park Circle in the median, they are mostly dead and heading towards Yosemite there are whole sections dead	8/28/2021 12:44 PM
7	Cost of water to maintain	8/15/2021 11:52 AM
8	I live in an HOA. The trees are well taken care of because we pay big time. Too much water for the grass, though.	8/14/2021 11:30 AM
9	Invasive trees as camphor tree	8/1/2021 7:14 PM
10	Lack of proper care for the municipal trees	8/1/2021 7:06 PM
11	parasites e.g. mistletoe	7/31/2021 6:59 PM
12	Right tree (species) right place	7/31/2021 8:23 AM
13	Physical space for multiple trees to mature.	7/30/2021 4:25 PM
14	The Trees not being trimmed enough and people not being able to use solar in Chico	7/28/2021 12:11 PM
15	Concern with NEIGHBOR'S tree - mess and fire hazard.	7/28/2021 8:40 AM
16	Collection of fruit to benefit those in need	7/28/2021 2:39 AM
17	Tree stress during drought	7/27/2021 7:16 PM
18	Incorrect tree species; beautiful older trees subject to extremely poor care and trimming practices; either poorly trained or uncaring city staff.	7/27/2021 4:31 PM
19	Growing non native tree species can disrupt the balance in the ecosystem.	7/26/2021 4:20 PM
20	The homeless taking up camp under our trees. Sawing off limbs to start fires at will with no reprecussions	7/25/2021 3:52 PM
21	I love my trees, especially my Valley Oak. :)	7/25/2021 7:30 AM
22	Untended trees / overgrowth on walkways	7/25/2021 5:54 AM
23	Transient related issues, feces, garbage, tents, gray water waste, sewerage, fires	7/23/2021 6:02 PM
24	I do not own property. I rent. Otherwise I would love to have more trees.	7/22/2021 7:39 PM
25	Want native trees that provide adequate shade	7/21/2021 12:37 AM
26	Effective maintenance to proactively deal with all of the above	7/19/2021 12:09 PM
27	Lack of care, pruning & maintence for all trees especially dead/ dying	7/16/2021 7:30 AM
28	Landlord	7/15/2021 6:45 PM
29	Don't own property.	7/15/2021 3:34 PM
30	Poorly selected species	7/12/2021 8:30 AM
31	The "city owned trees" that's are on the property that are never maintained by the city often cause damage to property and cars yet it is not the fault of Chico for neglecting to properly maintain their trees. The cost for the damages shouldn't be put on the homeowner when they are the city's responsibility to maintain them.	7/6/2021 10:33 AM
32	the lack of community education about the importance of our urban forest. for one they provide excellent habitat for rodent control, then there's	7/3/2021 6:07 PM
33	It would be great to have a choice of species (I hate hackberries and [redacted] would not let me replace it while its young), and i was told i could not prune it myself.	7/3/2021 4:07 PM

City of Chico Urban Forest Master Plan Survey

Q5 Of the following options, select the top TWO most important benefits that trees provide in your neighborhood.

Answered: 315 Skipped: 1

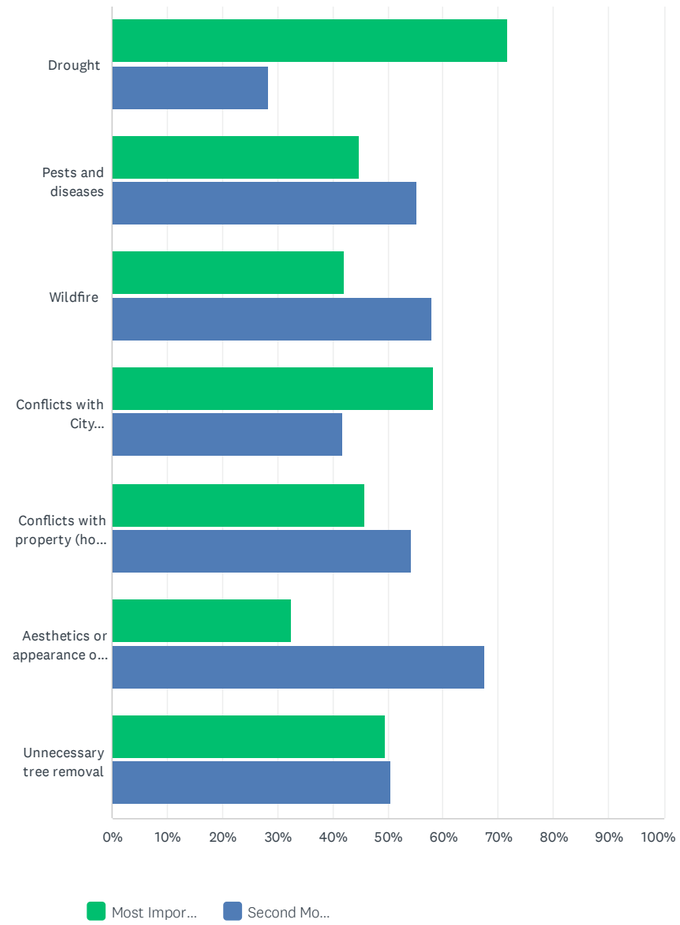


	MOST IMPORTANT	SECOND MOST IMPORTANT	TOTAL
Improving the environment (such as air quality, water pollution)	66.45% 101	33.55% 51	152
Cooling neighborhoods and homes	54.04% 87	45.96% 74	161
Protecting human health	40.00% 8	60.00% 12	20
Aesthetics or appearance	35.21% 25	64.79% 46	71
Improving property value	43.48% 10	56.52% 13	23
Habitat for wildlife	47.31% 44	52.69% 49	93
Carbon storage to mitigate for climate change	55.71% 39	44.29% 31	70

City of Chico Urban Forest Master Plan Survey

Q6 Of the following options, select the top TWO threats facing trees in your neighborhood.

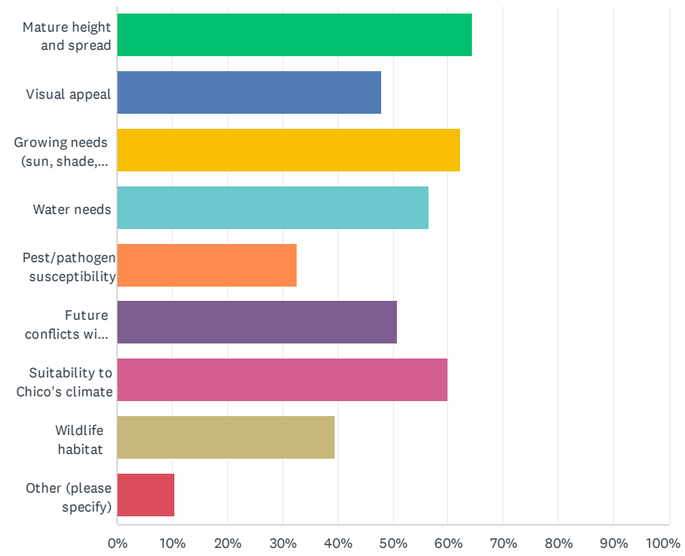
Answered: 313 Skipped: 3



	MOST IMPORTANT	SECOND MOST IMPORTANT	TOTAL
Drought	71.67% 129	28.33% 51	180
Pests and diseases	44.78% 30	55.22% 37	67
Wildfire	42.00% 21	58.00% 29	50
Conflicts with City infrastructure	58.18% 32	41.82% 23	55
Conflicts with property (home foundation, driveway, etc.)	45.78% 38	54.22% 45	83
Aesthetics or appearance of unmaintained trees	32.35% 22	67.65% 46	68
Unnecessary tree removal	49.40% 41	50.60% 42	83

Q7 What factors are important to consider when selecting a tree to plant on your private property? Check all that apply.

Answered: 315 Skipped: 1



ANSWER CHOICES	RESPONSES	
Mature height and spread	64.44%	203
Visual appeal	47.94%	151
Growing needs (sun, shade, soil type, etc.)	62.22%	196
Water needs	56.51%	178
Pest/pathogen susceptibility	32.70%	103
Future conflicts with infrastructure (e.g., sewer pipes, water pipes, irrigation, etc.)	50.79%	160
Suitability to Chico's climate	60.00%	189
Wildlife habitat	39.37%	124
Other (please specify)	10.48%	33
Total Respondents: 315		

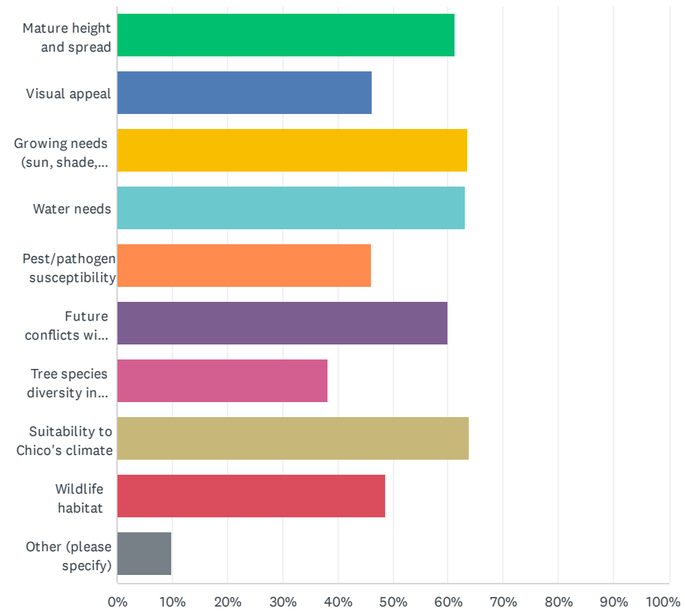
#	OTHER (PLEASE SPECIFY)	DATE

1	native	3/9/2022 10:16 AM
2	Native status	2/2/2022 11:24 AM
3	Mess caused by berries, pods, seed drop, etc	1/14/2022 7:18 PM
4	Powerlines	10/6/2021 4:59 PM
5	clean trees, not messy ones that shed all yearlong like Magnolias	9/21/2021 8:30 PM
6	compatibility with pre-existing trees	9/10/2021 5:31 PM
7	Valley and Blue Oaks should be planted - native to Chico	8/15/2021 11:52 AM
8	species, prioritize natives and those likely to thrive	8/10/2021 8:50 AM
9	space	8/9/2021 2:06 PM
10	producing food (fruit, nuts)	8/5/2021 6:13 PM
11	Does not cause allergy	8/1/2021 7:13 PM
12	I live in an apartment.	8/1/2021 12:38 PM
13	Renter, Can't plant trees.	8/1/2021 6:22 AM
14	Fruit baring	7/31/2021 9:22 PM
15	Maintenance cost	7/31/2021 6:59 PM
16	Longevity, non-invasive	7/30/2021 4:52 PM
17	Will I be able to put solar in place	7/28/2021 12:11 PM
18	No species invasive to natural parks.	7/27/2021 6:48 PM
19	n/a	7/26/2021 11:54 PM
20	Provides edible food for people	7/26/2021 5:40 PM
21	I only want to grow food - so mostly fruit trees & Native species	7/26/2021 2:43 PM
22	Climate readiness	7/26/2021 11:42 AM
23	HOW the tree is planted.	7/25/2021 7:30 AM
24	Reduced regulation by not planting anything at all	7/25/2021 5:54 AM
25	Deep rooted trees that can tap the water table vs shallow rooted trees that need supplimental irrigation	7/23/2021 6:54 AM
26	Location (is NOT UNDER POWERLINES)	7/16/2021 7:30 AM
27	Historical value	7/15/2021 3:34 PM
28	native species only	7/10/2021 2:20 PM
29	California native	7/7/2021 6:39 AM
30	For the love of all that is holy, STOP planting Sycamore trees next to sidewalks. The large roots ruin the sidewalk and make them near impossible to walk down, especially for elderly and those who have physical limitations.	7/6/2021 10:33 AM
31	I don't have any private property	7/3/2021 5:11 PM
32	maintenance needs and expense	7/3/2021 4:57 PM
33	Propensity for summer limb drop, having secondary functions like fruit or medicine	7/3/2021 4:07 PM

City of Chico Urban Forest Master Plan Survey

Q8 What factors are important to consider when the City selects a tree to plant on public property? Check all that apply.

Answered: 315 Skipped: 1



ANSWER CHOICES	RESPONSES	
Mature height and spread	61.27%	193
Visual appeal	46.35%	146
Growing needs (sun, shade, soil type, etc.)	63.49%	200
Water needs	63.17%	199
Pest/pathogen susceptibility	46.03%	145
Future conflicts with infrastructure (e.g., sidewalks, overhead utilities, etc.)	60.00%	189
Tree species diversity in my neighborhood	38.10%	120
Suitability to Chico's climate	63.81%	201
Wildlife habitat	48.57%	153
Other (please specify)	9.84%	31
Total Respondents: 315		

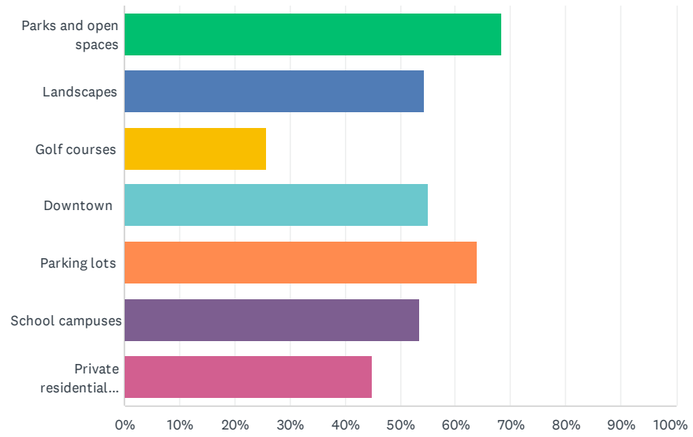
#	OTHER (PLEASE SPECIFY)	DATE
1	native	3/9/2022 10:16 AM
2	Fruiting/ seed production	10/6/2021 4:59 PM
3	Tree does not drop lots of leaves all year round, like the Eucalyptus planted next to our community mailbox, What a mess and a fire hazard !	8/27/2021 2:58 PM
4	location	8/16/2021 8:53 PM
5	Native oaks are the best solution - adapted to our climate so need less water, and wildlife benefits	8/15/2021 11:52 AM
6	Invasive trees as camphor trees	8/1/2021 7:14 PM
7	Healthy for people. Does not cause allergy or asthma.	8/1/2021 7:13 PM
8	Cost..stop using [redacted] prevailing wages to plant a stupid [redacted] tree	8/1/2021 6:01 PM
9	Maintenance needs	8/1/2021 2:29 PM
10	Impact on existing sidewalk and roads	8/1/2021 7:39 AM
11	Maintenance of tree	8/1/2021 6:51 AM
12	Mess from nuts seeds spread into adjacent properties	8/1/2021 4:13 AM
13	species that are native to california	7/31/2021 9:31 PM
14	maintenance cost	7/31/2021 6:59 PM
15	Longevity, non-invasive,	7/30/2021 4:52 PM
16	putting the right tree in the appropriate planting site.	7/29/2021 9:36 PM
17	Is a tree really the appropriate choice	7/28/2021 2:39 AM
18	No species that are invasive into natural parks.	7/27/2021 6:48 PM
19	Shade for structures	7/26/2021 5:40 PM
20	Make sure the tree is planted correctly, i.e., pull the roots out before sticking it in the hole. Most people don't do enough of that.	7/25/2021 7:30 AM
21	Contaminants such as sap and odor	7/25/2021 5:54 AM

City of Chico Urban Forest Master Plan Survey

22	limb drop	7/24/2021 4:31 PM
23	Wether or not they will be ruined by transient fires or feces	7/23/2021 6:02 PM
24	typical lifespan of the tree (i.e. does it start dropping branches and dying after 35 years? If so, lets not)	7/21/2021 4:09 PM
25	Native for biodiversity	7/20/2021 5:32 PM
26	n/a	7/19/2021 9:49 PM
27	native species	7/10/2021 2:20 PM
28	Maintenance needs	7/9/2021 4:24 PM
29	Habitat creation and shade creation	7/7/2021 6:39 AM
30	Native species	7/6/2021 7:20 PM
31	best native tree species is higher priority than visual appeal because wildlife habitat is essential	7/3/2021 4:57 PM

Q9 Where would you like to see more trees planted in Chico? Select all that apply.

Answered: 305 Skipped: 11

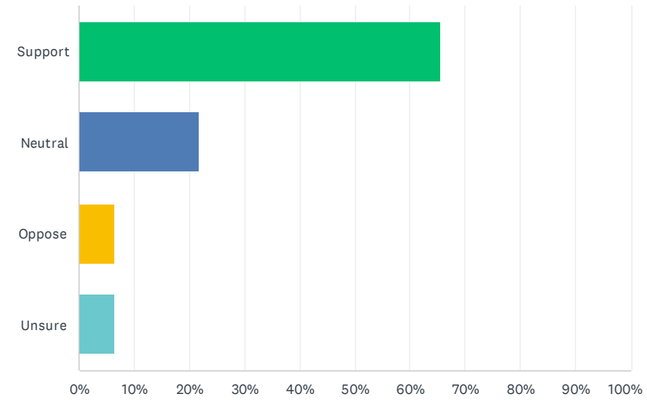


ANSWER CHOICES	RESPONSES	
Parks and open spaces	68.52%	209
Landscapes	54.43%	166
Golf courses	25.90%	79
Downtown	55.08%	168
Parking lots	63.93%	195
School campuses	53.44%	163
Private residential property	44.92%	137
Total Respondents: 305		

City of Chico Urban Forest Master Plan Survey

Q10 Are you in support of the City's Chapter 14 tree protection ordinance protecting street trees?

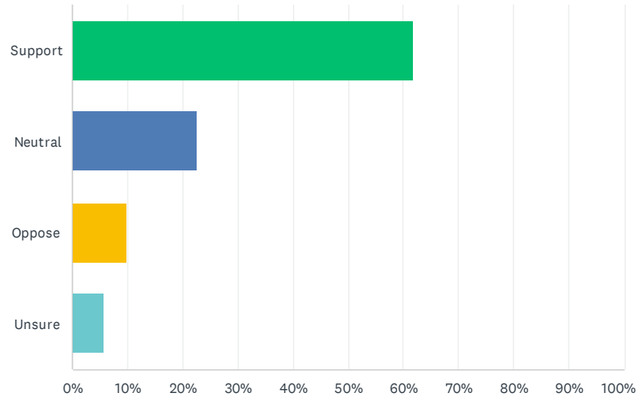
Answered: 295 Skipped: 21



ANSWER CHOICES	RESPONSES	
Support	65.42%	193
Neutral	21.69%	64
Oppose	6.44%	19
Unsure	6.44%	19
TOTAL		295

Q11 Are you in support of the City's Chapter 16 tree protection ordinance protecting private trees during development/construction?

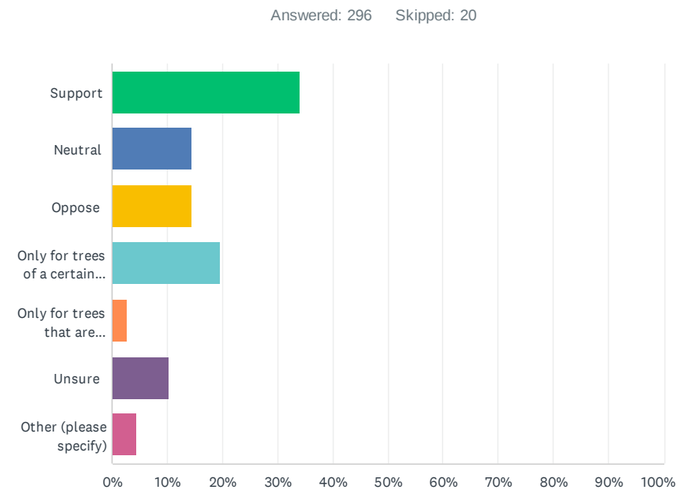
Answered: 293 Skipped: 23



ANSWER CHOICES	RESPONSES	
Support	61.77%	181
Neutral	22.53%	66
Oppose	9.90%	29
Unsure	5.80%	17
TOTAL		293

Q12 In terms of private property trees (such as trees in residential yards, business properties, privately-owned parking lots, etc.), would you support the creation of a tree protection ordinance for trees in existing development that extends protection to all trees?

Answered: 296 Skipped: 20



ANSWER CHOICES	RESPONSES	
Support	34.12%	101
Neutral	14.53%	43
Oppose	14.53%	43
Only for trees of a certain size or species (e.g., oaks)	19.59%	58
Only for trees that are visible from the street or are accessible to the public	2.70%	8
Unsure	10.14%	30
Other (please specify)	4.39%	13
TOTAL		296

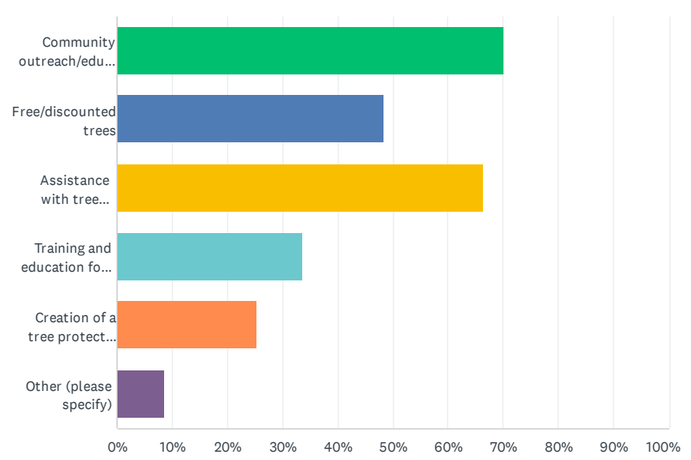
#	OTHER (PLEASE SPECIFY)	DATE
1	Removal of tress which endanger homes or infrastructure should be allowed after review if protection is extended to all trees.	9/10/2021 7:31 PM
2	depends on the ordinance language	8/16/2021 8:58 PM
3	support. Except the challenge that arises from the cost of watering the tree in addition to	8/15/2021 11:58 AM

	drought years. It makes most sense to plant our native oaks as they are adapted to no water in summers	
4	Trees that are diseased or dead need to be removed as appropriate.	8/14/2021 11:36 AM
5	tree protection has to include no blowers and no poison!	8/14/2021 6:06 AM
6	only for trees of a certain size or species OR if removing would leave a large uncovered area with no shade, environmental/animal habitat	7/31/2021 3:39 PM
7	Not for "trash" trees like ailanthus or other invasive species. For all other trees I would SUPPORT this measure.	7/29/2021 9:41 PM
8	Only if the private property was also using solar would I support	7/28/2021 12:14 PM
9	I strongly oppose added regulation when it comes to property owner rights. When a particular site is looked at for development infrastructure, site design, building design are always considered along with preservation of existing trees. The reality is is that new development requires a lot of impacts that prohibit the preservation of some trees. Most if not all projects add to the urban canopy with our current development regulations.	7/27/2021 11:41 AM
10	Generally a good idea	7/26/2021 11:55 PM
11	Only if said trees pose a danger to humans or the property of others.	7/24/2021 12:32 AM
12	Has to be considered weather tree is viable or not.	7/12/2021 8:38 AM
13	Stricter regulations on alteration/removal for native tree species, requiring replacement plantings to be native spp of local provenance - otherwise I support the regulations as written	7/3/2021 5:00 PM

City of Chico Urban Forest Master Plan Survey

Q13 What approach do you think would have the most impact towards achieving neighborhoods and residential homes with large and healthy trees? Check all that apply.

Answered: 291 Skipped: 25



ANSWER CHOICES	RESPONSES	
Community outreach/education for residents about tree species selection and care/maintenance	70.10%	204
Free/discounted trees	48.45%	141
Assistance with tree maintenance and care costs (e.g., pruning, watering, etc.)	66.32%	193
Training and education for local tree care businesses	33.68%	98
Creation of a tree protection ordinance for all trees on private property	25.43%	74
Other (please specify)	8.59%	25
Total Respondents: 291		

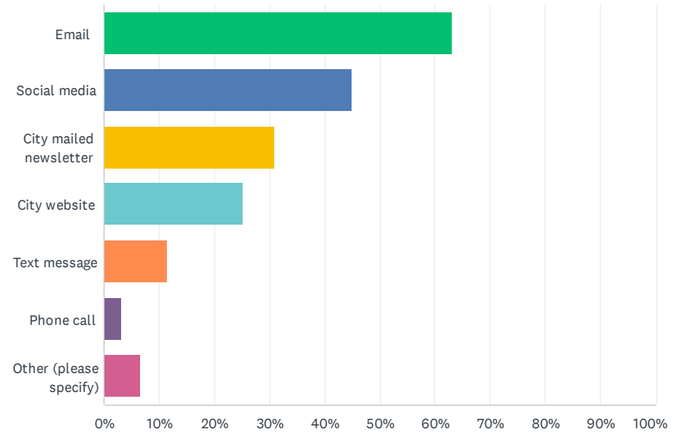
#	OTHER (PLEASE SPECIFY)	DATE
1	importance of native habitat	3/9/2022 10:17 AM
2	Creation of local pride in "city of trees" designation, and widespread adoption of fostering the health and increased numbers of city trees as positive environmental action.	9/10/2021 7:31 PM
3	Advice/verbal support to owners when they decide to "trim" their trees. My neighbor has ruined 5 trees on her property without realizing she has done so, Cut down 2 street trees but left the stumps. Cut down 4-5 healthy crape myrtle leaving large stumps that are now sprouting, massacred 2 Carolina laurels, but planted 4 large trees within 5' of each other.	8/27/2021 3:25 PM

4	no blowers and no poison!	8/14/2021 6:06 AM
5	Don't let developers cut down so many mature trees (even with replanting mitigation). Preserve them, work around them, value them higher.	8/5/2021 7:52 AM
6	Implementation of Regenerative practices for our landscapes.	8/2/2021 6:49 AM
7	trees in my area have out lived there life span and I can't afford the permits to have them removed. get rid of the permits	8/1/2021 5:44 PM
8	Stop promoting “drought resistant “ landscaping AKA rock yards. The planet needs more trees!	8/1/2021 1:05 AM
9	Training & education available freely re growing trees. Your question above maybe means the same thing, but sounds like it is FOR tree-care business, not businesses who additionally take on trees.	7/31/2021 1:27 PM
10	Incentives for those who have/plant Native species.	7/30/2021 5:39 PM
11	Re-direct general funds back to the tree maintenance program.	7/29/2021 9:41 PM
12	Education. Supervision so you have proper planting. Stop making people plant trees where they ruin sidewalks etc. It is stupid?	7/28/2021 4:05 PM
13	It woul be helpful if city was the leader by example instead of lacing an urban forester, being uncaring, inefficient, ineffective and making wrong choices.	7/27/2021 4:35 PM
14	Obviously assistance with costs would help but I highly doubt the City could afford such a program so I vote no	7/27/2021 11:41 AM
15	n/a	7/26/2021 11:40 PM
16	I'll say it again:Plant the trees correctly!	7/25/2021 7:32 AM
17	Reduced regulation and allowing property owners to decide what is best for their property - thus not threatening people with future consequences for what they plant today	7/25/2021 5:56 AM
18	Maintaining the native forest	7/20/2021 5:34 PM
19	n/a	7/19/2021 9:44 PM
20	Less space dedicated to roads and parking.	7/15/2021 3:37 PM
21	Restricting new trees on public property to species native to area	7/9/2021 4:27 PM
22	STOP planting sycamore trees	7/6/2021 10:36 AM
23	the removal of trees leaning more than 15 degrees otherwise the city is liable for property damage when the tree fall over.Athe “act of god” escape clause does not apply.	7/3/2021 6:18 PM
24	education on habitat values of natives - training the landscape workers to not massacre trees/shrubs and to comprehend the higher value of native spp	7/3/2021 5:00 PM
25	Having a good site to refer to that lists good trees for the area, their mature size, benefits, problems. Also supporting early training/pruning for species that are likely to have included bark issues like all the chinese pistaches and bradford pears etc	7/3/2021 4:13 PM

City of Chico Urban Forest Master Plan Survey

Q14 What is the best way for the City to communicate with you about the urban forest and its management? Check all that apply.

Answered: 285 Skipped: 31



ANSWER CHOICES	RESPONSES	
Email	63.16%	180
Social media	44.91%	128
City mailed newsletter	30.88%	88
City website	25.26%	72
Text message	11.58%	33
Phone call	3.16%	9
Other (please specify)	6.67%	19
Total Respondents: 285		

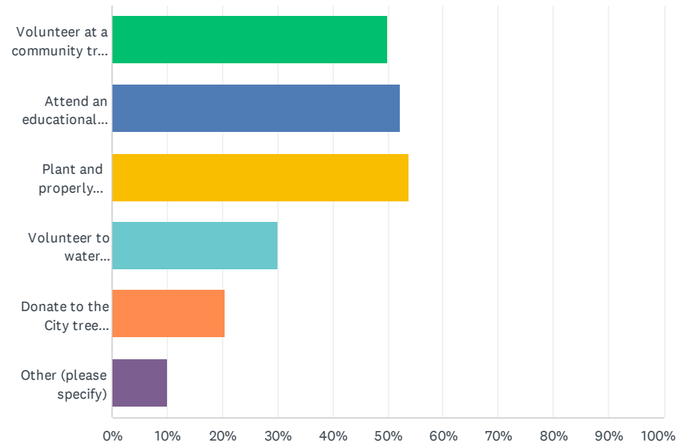
#	OTHER (PLEASE SPECIFY)	DATE
1	Seminar	4/10/2022 7:27 AM
2	Flyer	2/17/2022 8:25 AM
3	TV and Radio PSAs profiling trees as part of our community.	9/10/2021 7:39 PM
4	Radio/tv public service announcements	8/27/2021 3:40 PM
5	None	8/21/2021 2:35 PM
6	Community booth	8/21/2021 1:49 PM

7	billboards, letters to the editor	8/14/2021 11:43 AM
8	Signs placed around the city to keep the subject fresh in the public's minds each time they drive/walk by them. Essentially these would be signs that have short urban forest tips written on them about how to care for their trees etc. etc./messages to motivate the viewer to contribute to the urban forest environment.	8/2/2021 1:00 AM
9	Newsletter by email	8/1/2021 7:21 PM
10	Press release local newspaper	7/30/2021 5:02 PM
11	Highlighted TV news events	7/28/2021 9:20 AM
12	Newspaper since we're lucky enough to have one!	7/27/2021 11:11 PM
13	How about well written regular postings in our local newspapers?	7/27/2021 4:42 PM
14	If City website, it needs to be prominent, not buried.	7/24/2021 4:40 PM
15	Use networks of people: Associations, Rotary, large employers	7/23/2021 2:22 PM
16	n/a	7/19/2021 9:44 PM
17	Newspaper	7/19/2021 12:20 PM
18	Billboard, banners, booths at farmer's market.	7/15/2021 3:44 PM
19	press releases & workshops & Zoom town halls.	7/3/2021 6:50 PM

City of Chico Urban Forest Master Plan Survey

Q15 Which of the following activities would you be willing to participate in to support the City's tree canopy goals? Check all that apply.

Answered: 279 Skipped: 37



ANSWER CHOICES	RESPONSES	
Volunteer at a community tree planting	49.82%	139
Attend an educational workshop	52.33%	146
Plant and properly maintain a tree on your private property	53.76%	150
Volunteer to water City-owned trees near your property	30.11%	84
Donate to the City tree donation fund	20.43%	57
Other (please specify)	10.04%	28
Total Respondents: 279		

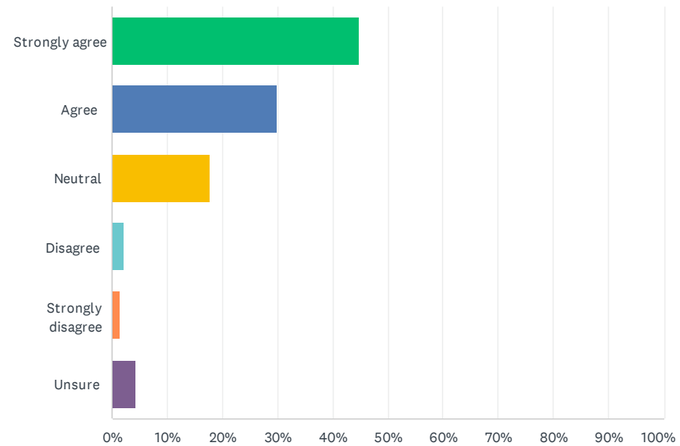
#	OTHER (PLEASE SPECIFY)	DATE
1	educational outreach	3/9/2022 10:24 AM
2	Help educate	10/6/2021 5:03 PM
3	cultivate trees planted in the curb strip in front of my house. Also, lobbying for inclusion of tree cultivation in city planning of infrastructure changes/repairs and new construction A	9/10/2021 7:39 PM
4	I have volunteered to be on a landscaping committee for the HOA. We have a pretty good tree maintenance program since what we plant size-wise is very important.	8/28/2021 1:02 PM
5	None	8/21/2021 2:35 PM

6	contact environmental organizations for input	8/16/2021 9:02 PM
7	I can assist with education of planting & maintaining native oaks in Chico	8/15/2021 12:08 PM
8	stop blowers and poison!	8/14/2021 6:08 AM
9	pay my water bill to keep my trees alive	8/2/2021 10:26 AM
10	Instead of [redacted] away time and money on this, why don't you figure out a way to fix your homeless problem	8/1/2021 6:04 PM
11	is this not what our tax dollars are for?	7/28/2021 4:16 PM
12	Attend The Traditional Ecological Knowledge workshop on trees that are not invasive.	7/28/2021 12:18 PM
13	Donate sapling dogwood and redbuds that sprout in my yard.	7/27/2021 11:11 PM
14	I have beautiful, appropriate, well care for trees on my property which the city tried to inappropriately trim.	7/27/2021 4:42 PM
15	provide 600 acres of land for volunteer tree planting	7/27/2021 8:39 AM
16	n/a	7/26/2021 11:56 PM
17	n/a	7/26/2021 11:41 PM
18	Canvas for dangerous tree limbs or unhealthy trees	7/25/2021 11:43 AM
19	I'd be willing to make a donation to the City trees, HOWEVER, if the city would cut back on hiring more cops, lower the City Manager's, City Clerk's, all heads of Depts., we'd have more money for trees.	7/25/2021 7:40 AM
20	Being a taxpayer	7/25/2021 5:59 AM
21	my family would do anything to help with Chico's trees but NOT with vagrants camping in our parks and destroying downtown. It would be a waste. They destroy our lands, parks and waterways.	7/23/2021 6:05 PM
22	Working with the Vina groundwater agency to prioritize monitoring and maintaining the water table that deep rooted trees use for evapotranspiration.	7/23/2021 7:07 AM
23	n/a	7/19/2021 9:44 PM
24	Help prune trees in the community.	7/12/2021 8:41 AM
25	Online education or workshop	7/6/2021 12:38 PM
26	community outreach event for tree education(especially volunteer opportunities) & fundraiser.	7/3/2021 6:50 PM
27	help develop lists of suitable trees for habitat values	7/3/2021 5:03 PM
28	Offer my little neighborhood nursery as a location for educational material or trees for sale/giveaway	7/3/2021 4:21 PM

City of Chico Urban Forest Master Plan Survey

Q16 Rate your reaction to the following statement: Homeowners should be encouraged to increase the number of healthy trees on their property.

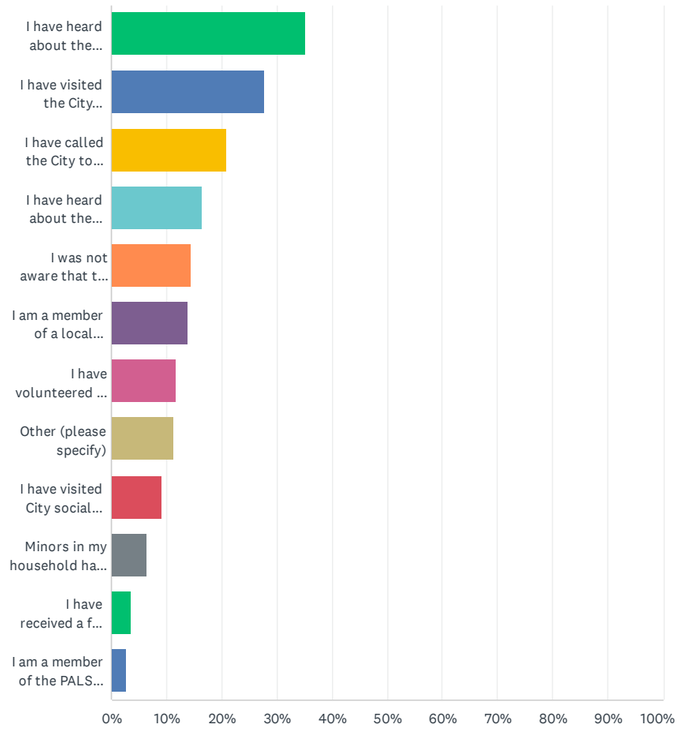
Answered: 288 Skipped: 28



ANSWER CHOICES	RESPONSES	
Strongly agree	44.79%	129
Agree	29.86%	86
Neutral	17.71%	51
Disagree	2.08%	6
Strongly disagree	1.39%	4
Unsure	4.17%	12
TOTAL		288

Q17 The City of Chico manages over 34,000 street trees and other trees in parks and open spaces. What is your awareness of the City of Chico urban forest program? Check all that apply.

Answered: 281 Skipped: 35



City of Chico Urban Forest Master Plan Survey

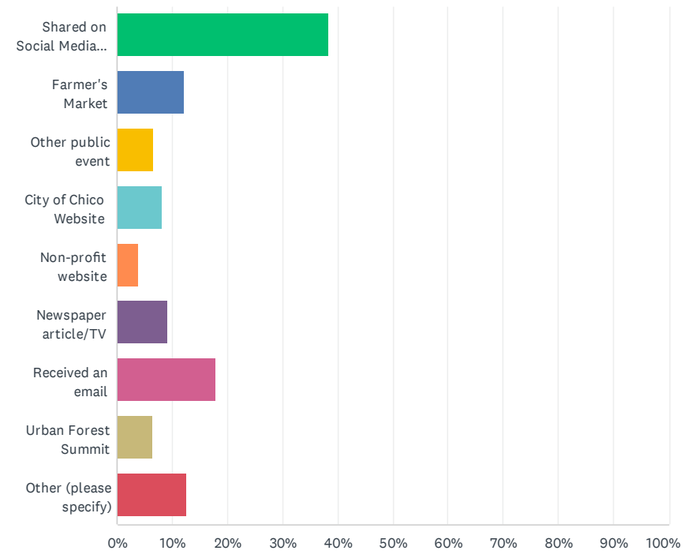
ANSWER CHOICES	RESPONSES	
I have heard about the City's tree care activities and plans on local tv, radio or newspapers	35.23%	99
I have visited the City webpage to find more information about trees	27.76%	78
I have called the City to report tree-related issues or concerns	21.00%	59
I have heard about the Voluntary Heritage Tree Program	16.37%	46
I was not aware that the City manages trees	14.59%	41
I am a member of a local non-profit that supports the City's urban forestry initiatives	13.88%	39
I have volunteered in park or neighborhood tree planting events	11.74%	33
Other (please specify)	11.39%	32
I have visited City social media sites to find more information about trees	9.25%	26
Minors in my household have participated in school campus tree planting events such as Arbor Day	6.41%	18
I have received a free tree from the City or partnering local non-profit agency	3.56%	10
I am a member of the PALS (Partners, Ambassadors, Leaders and Stewards) volunteer program	2.85%	8
Total Respondents: 281		

#	OTHER (PLEASE SPECIFY)	DATE
1	I am a consulting Utility Forester under PG&E Veg Managment, I've patrolled around the powerlines in the city	10/6/2021 5:03 PM
2	I work at CARD	9/15/2021 10:31 AM
3	I maintain (water and fertilize) city trees next to my property	9/10/2021 7:39 PM
4	I've seen them at work	8/21/2021 2:15 PM
5	I was not aware of any of these	8/15/2021 12:08 PM
6	I'm aware the City doesn't have enough resources for urban trees. I water and get professional pruning for our street tree myself. I'm not sure the City is replanting fast enough.	8/5/2021 8:04 AM
7	I'm not really too educated on the urban forest plan. I just have a passion for protecting the health of local forests after losing all of my trees to the campfire.	8/2/2021 1:00 AM
8	If it's on city property the city has to manage the trees. I already knew that	8/1/2021 6:04 PM
9	I love trees	8/1/2021 4:42 PM
10	I notice that a lot of city trees are in need of maintenance	8/1/2021 6:58 AM
11	I have enjoyed city planted/maintained tress, esp. along E 8th St.	7/31/2021 1:29 PM
12	I have worked directly with the Urban Forest Manager on design and construction projects.	7/28/2021 5:05 PM
13	I volunteered to water baby oak trees in upper park	7/28/2021 12:03 PM
14	I have watched with sadness the deteriotion and destruction of the Bidwell Park tree canopy. I have opposed removal of trees on school sites to no success.	7/27/2021 4:42 PM
15	no answer	7/26/2021 11:56 PM
16	n/a	7/26/2021 11:50 PM
17	n/a	7/26/2021 11:41 PM
18	I have heard about the city's program via word of mouth	7/26/2021 6:21 AM

19	I'm a member of Chico Tree Advocates	7/25/2021 7:40 AM
20	I have friends that help plant neighborhood trees	7/24/2021 4:40 PM
21	I am aware of the Chico's rich history and so I am aware of it's trees.	7/23/2021 6:05 PM
22	I am aware of the regulations regarding trees in Chico	7/23/2021 2:22 PM
23	Served on the city tree committee	7/20/2021 5:36 PM
24	n/a	7/19/2021 9:44 PM
25	None of the above apply	7/19/2021 4:27 PM
26	I read most of the Urban Forestry Plan off the BEC website.	7/15/2021 3:44 PM
27	I was a Park Commissioner who was chartered with dealing with Chico's trees	7/13/2021 10:26 AM
28	None	7/6/2021 12:38 PM
29	I had no clue they managed trees because most of them do not look maintained. The large amount of overgrown trees and dead branches that fall and cause damage support the idea that one may think there is no management being done on the trees.	7/6/2021 10:42 AM
30	Member of Garden Club that invites speakers	7/4/2021 5:35 PM
31	I've commented to City Council and others on urban forestry activities and plans	7/3/2021 5:03 PM
32	I have presented arbor day activities, mostly as an employee of western environmental consultants	7/3/2021 4:21 PM

Q18 How did you hear about this survey?

Answered: 286 Skipped: 30



ANSWER CHOICES	RESPONSES	
Shared on Social Media (Facebook, Instagram, Nextdoor, etc)	38.46%	110
Farmer's Market	12.24%	35
Other public event	6.64%	19
City of Chico Website	8.04%	23
Non-profit website	3.85%	11
Newspaper article/TV	9.09%	26
Received an email	17.83%	51
Urban Forest Summit	6.29%	18
Other (please specify)	12.59%	36
Total Respondents: 286		

#	OTHER (PLEASE SPECIFY)	DATE
1	Online Action News article.	4/10/2022 5:00 AM

2	work with city of Chico	3/28/2022 11:34 AM
3	Google	2/10/2022 5:46 PM
4	Who ever runs city of chico fb responded to me, really appreciate it!	10/6/2021 5:03 PM
5	Master Gardeners	8/28/2021 1:02 PM
6	Chico Summerfest	8/25/2021 11:26 PM
7	Chico Summerfest	8/25/2021 11:22 PM
8	Chico Summerfest	8/25/2021 11:17 PM
9	Chico Summerfest	8/25/2021 11:01 PM
10	Chico Summerfest	8/25/2021 10:54 PM
11	Chico Summerfest	8/25/2021 10:37 PM
12	Summerfest	8/21/2021 1:49 PM
13	Summerfest	8/21/2021 1:47 PM
14	Altacal Audubon Society	8/16/2021 9:02 PM
15	Shared in Altacal Audubon's newsletter	8/15/2021 12:08 PM
16	AltaCal newsletter	8/14/2021 11:43 AM
17	BEC	8/10/2021 8:53 AM
18	Web news feed	8/1/2021 7:25 PM
19	Shared with me by a friend	8/1/2021 7:21 PM
20	Google news	8/1/2021 4:42 PM
21	Text from friend.	8/1/2021 9:12 AM
22	Google news feed	8/1/2021 8:01 AM
23	Google news	8/1/2021 6:58 AM
24	Online news outlet	8/1/2021 5:46 AM
25	sibling, and friends who attended urban forest summit	7/31/2021 3:41 PM
26	DACC meeting	7/30/2021 9:06 PM
27	chico builders assoc	7/27/2021 8:40 AM
28	BEC enewsletter	7/25/2021 6:18 PM
29	Friend	7/25/2021 5:39 PM
30	A friend with Chico Tree Advocates e-mailed me this survey.	7/25/2021 7:40 AM
31	City staff	7/24/2021 4:40 PM
32	Butte Environmental Council	7/22/2021 7:45 PM
33	Family member	7/22/2021 2:53 PM
34	I work as an Urban Forest Coordinator, helping plan upcoming Urban Forest Summit	7/19/2021 10:04 PM
35	from a friend	7/19/2021 1:04 PM
36	we need to double our tree budget. the police get 48.8 % of our city budget, this is a good place to start when redirecting monies into our tree budget. tree maintence is a public safety issue too. I remember when we lost our majestic Dutch Elms because of city mismanagement. we need a citizens oversight commission to watch out for the welfare of our urban forest.	7/3/2021 6:50 PM

City of Chico Urban Forest Master Plan Survey

Q19 Do you have any other additional comments, suggestions or concerns about Chico's urban forest?

Answered: 152 Skipped: 164

#	RESPONSES	DATE
1	We live near Lindo Channel. There are a lot of vines growing over beautiful trees. The vines are affecting the tree health and pulling some over.	4/10/2022 5:00 AM
2	I would love to help launch an initiative in elementary schools to educate about the importance of trees, particularly native trees, and encourage stewardship and activism in the next generation. I'm a 5th grade teacher in Chico and I would be happy to develop and launch an initiative at my school, Little Chico Creek.	1/22/2022 6:30 PM
3	We recently contacted the urban forester to identify the tree that the city planted along the sidewalk in front of our house as we have questions about its care. We did not receive a response. It would be helpful to have a way to identify the trees by address	1/14/2022 7:27 PM
4	I believe education for the public would be ideal to start!	10/6/2021 5:03 PM
5	Reducing unwanted species	9/15/2021 10:31 AM
6	When planting street trees select trees which provide a large shade canopy and not small ornamentals.	9/12/2021 9:09 AM
7	Just 'right tree, right place' and please plant a variety of species.	9/6/2021 6:38 PM
8	Many of the urban trees have died in my area (CalPark). I have been in contact with Chico operations and maintenance dept. in regard to water running down Bruce and Cal Park Dr. with trees dying in those areas probably because of lack of water. This is terrible considering the water situation. I need to call again next week because nothing has been done since the last time I called about 2 weeks ago. No one seems too stressed about it but have shown some concern over water running down the street. Am I the only one concerned about this? I would think this department would be inundated with phone calls about this. The trees are dying and water is being wasted.	8/28/2021 1:02 PM
9	Chico trees add great value esthetically and are an under appreciated environmental service to Chico. Redding has a public service announcement on NPR every morning about protecting their sewer system - about grease, wipes and roots. I notice these announcements changed my behavior over time. Suggest a similar campaign for Chico trees. My biggest concern is wildfires when we have a canopy of unmanaged trees and dry ground cover. Drive along Vallombrosa and E.8th alongside lower Bidwell Park. One spark, a little wind and we will have an inferno.	8/27/2021 3:40 PM
10	Climate change has led to the destruction of so many trees and natural reserves on this planet. Human beings need to wake up and realize this because it's reached critical mass.	8/25/2021 11:01 PM
11	No	8/21/2021 2:35 PM
12	Would love to see more healthy trees!	8/21/2021 2:16 PM
13	Maintaining the trees health	8/21/2021 1:47 PM
14	In the past few years I have witnessed mature trees in my neighborhood being removed at alarming rates, and associated habitat for birds and critters go away as well. I understand why they are taking them down due to the cost to water and the threat damage from them if they don't water them. I think the best solution is the planting of our native oaks as all of the wildlife rely on acorns, and the trees are adapted to living in this environment without any watering once established... and they provide excellent shade. Thank you for the opportunity to provide comments, and for all you do to protect our precious shade and quality of life the trees provide here	8/15/2021 12:08 PM
15	I worry about fire. Maybe goats are a problem, but I would like to see a lot of goats in our	8/14/2021 11:43 AM

	Bidwell Park and elsewhere eating the grass, etc. Find ways of removing brush, i.e. the kindling	
16	no blowers and no poisons!	8/14/2021 6:08 AM
17	Coordination with PG&E tree trimming, they butcher so many trees. We have 4 large trees on our property. It is a heafty fee to get them trimmed and maintained. One of them is on city property, which the city used to come and trim. Now it is on the removal list	8/9/2021 2:16 PM
18	I fully support FREE tree give aways	8/7/2021 8:42 AM
19	Have we been keeping up the urban forest sufficiently as our trees age? Can we protect more trees from destruction as new houses get built? How can we force new construction to protect MORE mature trees plus add new ones?	8/5/2021 6:18 PM
20	Concerned it's not getting enough attention (replanting, pruning, expanding). Very concerned that fast/profitable development is a higher priority than our environment--far too many mature trees get removed. Replacing them with young trees is not sufficient. Concerned that we're not replenishing groundwater, which would benefit trees; too much pavement, esp in new development, means water runs off to the sewer instead of soaking into the ground.	8/5/2021 8:04 AM
21	Maybe send your knowledge, experience, and ideas to Paradise	8/3/2021 3:21 PM
22	will property owners be able to afford to water their trees	8/2/2021 10:26 AM
23	Concerns about utility wire problems and tree health, aesthetics from annual trimming	8/1/2021 7:25 PM
24	Seriously, you guys are going to piss away all this time energy and money about something as inconsequential as a tree beautification project. Why don't you figure out a way to help the veterans, or that disgusting [redacted] homeless problem you have. And moving it up to the airport is not fixing the problem	8/1/2021 6:04 PM
25	the fees and permits to handle dying trees on private property are excessive. I've called the city out to look at a tree to tell me its fine and a month or two later it fell over. Get rid of the permit fees.	8/1/2021 5:48 PM
26	All plants and trees are pretty cool!	8/1/2021 4:42 PM
27	We need a lot more trees in Chico to keep residential and commercial neighborhoods cool on summer and to enhance property values	8/1/2021 11:43 AM
28	No	8/1/2021 8:23 AM
29	No	8/1/2021 8:01 AM
30	Love the trees!!! Chico is the City Of Trees! However, I'm really concerned about limb drop - especially with the drought and the heat. Just yesterday, two sycamores near where I live had limbs drop.....blocking traffic in the street. If someone had been under them, ouch! The other thing that is concerning are the roots - we just took out a sycamore root under our front porch. Our front porch has to be rebuilt due to this root pushing up the concrete. Total cost = $5,000. And that's just one root!! So....love the trees.....but some issues there as well.	8/1/2021 4:53 AM
31	Keep Chico green! We love the leaves, the shade, all of it!	8/1/2021 1:12 AM
32	I think some of the city trees in the barber neighborhood are not well taken care of. Neighbors would like to plant better trees and take good care of them, but they can't remove the not-well-taken-care of city trees.	7/31/2021 9:27 PM
33	Thank you for such a beautiful, tree-filled town.	7/31/2021 1:29 PM
34	Continue to fund and manage the urban forest in Chico. It is important. Use more native and drought tolerant species to meet changing climate	7/31/2021 8:30 AM
35	Drought, the aquifer, climate change	7/30/2021 9:06 PM
36	Would like education about water table. Is it dropping enough to become beyond reach of trees' roots? The trees at my house look stressed.	7/30/2021 6:20 PM
37	It would benefit the appearance and health of the trees to be trimmed appropriately around power lines. Too many have been hacked away with no regard for the tree.	7/30/2021 5:46 PM
38	Concerned about the number of trees lost or removed at Chico High School and some	7/30/2021 5:02 PM

City of Chico Urban Forest Master Plan Survey

	Elementary Schools that have not been replaced.	
39	I think outreach such as this survey is most important Too many of us take our trees for granted. Each tree is a living member of our community and needs to be treated as such.	7/30/2021 2:30 PM
40	The city leaders and council need to make caring for our urban forest a top priority, not just lip service!	7/29/2021 9:59 PM
41	New owner or developer needs to provide tree canopy for parking lot. (no trees now) Grocery Outlet needs to water and maintain trees in their parking lot.	7/29/2021 12:41 PM
42	You have contractors plant trees in the front yard on new homes which is nice. Then you require a 4' strip of landscape with trees in it between the side walk and the street. Takes as much water as a full yard behind it. The trees start buckling the sidewalk at the owners expense. Cal water charges more then PG & E which is highway robbery and then you wonder why people do not maintain it. Come up with a plan that is owner friendly and environmentally friendly.	7/28/2021 4:16 PM
43	What about the wetlands here in Chico?	7/28/2021 12:18 PM
44	I'm still sad that Warner Street went from a canopy of mature camphor and sycamore trees to a sun-baked wasteland of gravel parking lot and aluminum butts, I mean seats at the stadium.	7/28/2021 12:03 PM
45	There are some trees that can be invasive, and I hope that they do not fall under the tree protections (like "tree of heaven"). If someone wants to remove one of those (or other invasive species), they should not be fined.	7/28/2021 11:38 AM
46	I would like to see more emphasis on native trees being planted if possible, so as to improve wildlife habitat. Also just more info going out to the public about the program/goals etc.	7/28/2021 9:20 AM
47	Are developers/park planners(CARD)/parking lots/, etc...given a list of native trees to plant that are compatabile with Chico climate? A requirement to plant native trees I think should be included with every project.	7/28/2021 8:55 AM
48	The dead and down trees and waste from the trees in Bidwell Park need to be cleaned out. It is a dangerous fuel source for vegetation fires and provides more hiding places for Chico's homeless population; which are also a big source of the fires.	7/28/2021 8:01 AM
49	Hope you've replaced the forester. Too important to be left empty. Perhaps I'm wrong that the post was vacant.	7/27/2021 11:11 PM
50	I'm glad to hear that this tree summit is happening. I feel that we are losing our tall tree canopy as many homeowners seem to prefer planting shorter trees these days. I see many beautiful trees being removed or maimed and I can't understand why people don't value them more.	7/27/2021 7:22 PM
51	Who can identify little volunteer trees that sprout in my yard?	7/27/2021 6:47 PM
52	This survey was way to long	7/27/2021 5:02 PM
53	Thank you!	7/27/2021 5:00 PM
54	The city needs to hire and retain a qualified Urban Forester. The city should and could form an alliance with CARD and CUSD so those entities know tree care, stop planting the wrong species and stop their bad tree practices.	7/27/2021 4:42 PM
55	Please meet with applicants early in the design process to use trees to enhance the project, and preservation to drive project design .	7/27/2021 4:27 PM
56	No new added regulations to new development	7/27/2021 11:43 AM
57	The current tree program is a good one. no need to add more laws or rules.	7/27/2021 9:38 AM
58	The city removed a tree in my front yard that was fine and then planted a new tree with no root barriers. They require us to install root barriers but they don't use them	7/27/2021 8:40 AM
59	I would like to see our beautiful Bidwell Park cleared of all illegal living quarters of transients who are destroying our green spaces and sensitive environmental areas. These transients have NO stake in our community and cut branches from park trees, begin illegal fires, urinate and defecate near our creeks, threaten citizens using the park for exercise and recreation, trash and contaminate the park and have no respect for environmental laws! Why can California cities not enforce their own laws without outside interference and frivolous lawsuits?	7/26/2021 6:36 PM

	This is the most pressing issue in our city today and the citizens of Chico who live, work and recreate here want action taken to preserve this treasure of a park, gifted to Chico with restrictions and guidelines which must be followed!	
60	I certainly hope that the Chico Urban Forest is a continued investment and priority for our City!	7/26/2021 5:44 PM
61	Need to start planting more native trees, and listen to Mechoopda tribe for best practices to managing the land. As well as adding controlled burns to areas that need it to prevent massive wildfires for future generations.	7/26/2021 4:25 PM
62	Chico is the city of trees! We need to keep it that's way.	7/26/2021 8:25 AM
63	No	7/25/2021 8:56 PM
64	I love trees and appreciate the importance of trees for the environment, our health, and their beauty. I, also, understand the cost of maintaining healthy trees in the urban environment; thus, am concerned about how and who will be responsible for this maintenance.	7/25/2021 5:39 PM
65	The trees on the midway and Bidwell park need to be trimmed more often as the limbs fall.	7/25/2021 4:52 PM
66	Allocate funding to trimb overhanging trees on powerlines and constant pruning and limbing.	7/25/2021 11:43 AM
67	Homeless individuals tear down branches in the park to build shelters and ruin trees! What is being done about this? I haven't seen anyone being issued citations for this! It's so reprehensible!	7/25/2021 10:51 AM
68	Our Urban Forest is one of biggest assets to our community. We all love our "leafy" canopy and yet we take it for granted. I'd rather have more trees and fewer cops, especially now that climate change is out of control. Trees make our town more sustainable. I could go on but you get the idea - I love trees.	7/25/2021 7:40 AM
69	Fire prevention. Carr Fire can happen here, and trees are the fuel. CoC should bake fire protection into every tree it plants.	7/25/2021 5:59 AM
70	I'd like for more people to know about and volunteer their trees for the heritage program as well as an updated site or pdf of heritage trees. There hasn't been any new heritage trees added for years that I can tell - I love that this summit is coming up and I also would love to have the city recognize the idea of fruit trees like figs, or citrus for urban foraging. And also I think many residents hate the evil spikey ball trees - sweet gum- please never plant any more of those again. Thanks!	7/25/2021 1:00 AM
71	as a homeowner we need help maintaining, watering, or removing older, larger trees. and yes, that includes financial assistance.	7/24/2021 5:19 PM
72	I support more trees on private property, though it seems some trees are being removed to allow for solar installations. This balance needs to be discussed.	7/24/2021 4:40 PM
73	Please start trimming the trees in Lower Bidwell Park. They need help desperately	7/24/2021 4:10 PM
74	A major concern is the lack of care and clearing in Bidwell Park of dead and dying trees and brush for fire safety	7/24/2021 7:58 AM
75	My family is extremely concerned about the vagrant population destroying our parks, waterways (which effects everything) and our greenways.....We no longer go to the parks or downtown. The smell and presence of scary looking violent people and their drug use are a major deterrent. It is disheartening Chico has come to this condition.	7/23/2021 6:05 PM
76	City owned trees are destroying my sewage connection. I have to frequently pay for rooting. The rooting company suggested the pipes may need repair. They're city trees, the city should pay for repair. I've also invested over a thousand dollars in pruning to keep the trees from growing over my structure. I shouldn't have to do that.	7/23/2021 10:50 AM
77	The unirrigated urban forest requires a robust groundwater level > 50-70' to provide subirrigation to endure the dry periods. Residential redwood trees seem out of place as the giant trunks and towering canopy can disrupt infrastructure and present safety risks. Birch trees are too shallow-rooted to survive without irrigation.	7/23/2021 7:07 AM
78	We are in a never ending drought. The city of Chico and BEC seem to be obsessed with the idea of a "city of trees". I understand the benefit of trees, they purify the air and water and provide valuable shade in the heat island etc. But our current climate situation simply cannot	7/23/2021 12:29 AM

City of Chico Urban Forest Master Plan Survey

	support the large non-native species that we see everywhere in Chico. Planting Chinese Pistache trees on every corner equates to future fuel for fire. Not to mention the damage caused by summer limb drop. We should plant vegetation for the climate we have, not the climate we want..	
79	Want to learn more	7/22/2021 2:53 PM
80	BEC is awesome	7/21/2021 4:13 PM
81	We need to evaluate the costs/benefits of the small vs large trees in the city.	7/20/2021 5:36 PM
82	The city has cut down too many trees. Some over 100 years old!	7/19/2021 9:56 PM
83	I'm interested in how the City is collaborating with the local Native American tribe, Mechoopda on this. A partnership with them on this issue is critical and very important	7/19/2021 4:30 PM
84	No	7/19/2021 4:27 PM
85	Plant more oak trees	7/19/2021 1:04 PM
86	Establish standards for tree maintenance by city (ie, park, engineers) staff, utilities, and commercial tree maintenance companies.	7/19/2021 12:20 PM
87	Class 1 bikeways in particular are in need of tree canopy — like the new one between In n Out and Notre Dame, the old rail path to the airport, and especially the path adjacent to the railroad north of 4th Ave.	7/15/2021 3:44 PM
88	One of Chico's biggest urban forest problems are the non-native, exotic, invasive trees that have proliferated since the State Forestry developed the nursery where Cedar Grove. They introduced a lot of exotics that have clearly taken over the community. Caltalpas that the Park Department ignores have taken over the riparian habitat from Cedar Grove all the way to the Sacramento River. Privets and ailanthus are everywhere in town. We need to manage invasive exotics everywhere public and private property. Your survey talks about public trees in neighborhoods, well there are many neighborhoods that don't have public or street trees in them.	7/13/2021 10:26 AM
89	how educated is the City of Chico in using traditional ecological knowledge to educate the urban forest program & it's employees?	7/10/2021 2:31 PM
90	The City, unfortunately, doesn't do much to protect trees along Lindo Channel on West Lindo Ave. The aggressive-mowing allows people to park their cars on the shoulder (something rarely done when the county maintained Lindo Channel), and the City never plants replacement trees when trees are lost.	7/7/2021 10:51 AM
91	I think the tree ordinances shown above are not strong enough. Fines should be steeper and trees on private property should be strongly protected as community, not public, goods. The newer rooftop solar requirements create conflict for homeowners' decisions about planting more trees. And, we need to be planting oaks, not exotics, to support habitat for local insects and birds that are seriously in decline. Thanks for the opportunity to share my thoughts and opinions. Chico' s urban forest is extremely important.	7/7/2021 6:54 AM
92	The trees are clearly in need of maintenance. Even our grand Esplanade looks to be on the decline.	7/7/2021 6:36 AM
93	Trees truly make Chico unique and a wonderful place to live. My friends and family that visit are always wowed by our trees.	7/6/2021 10:35 PM
94	I would like to see options for planting in public right of way in sidewalk planter space in neighborhoods. Alternatives to trees, when they aren't an option. I would be nice if spaces could be seeded with native seeds or turned into small garden areas. Obviously this wouldn't be able to be maintained by the City and would require maintenance by the adjacent owner. Perhaps the City could provide native seed mix (at cost? Or a small profit that's returned back to the program?) as well as planting and care information so residents can create habitat space for native pollinators. Maybe residents could sign up for a program like this freely so the City can track the data.	7/6/2021 7:27 PM
95	NO	7/6/2021 6:00 PM
96	NO	7/6/2021 5:54 PM

City of Chico Urban Forest Master Plan Survey

97	NO	7/6/2021 5:48 PM
98	NO	7/6/2021 5:42 PM
99	NO	7/6/2021 5:31 PM
100	NO	7/6/2021 5:05 PM
101	NO	7/6/2021 4:54 PM
102	NO	7/6/2021 4:42 PM
103	NO	7/6/2021 4:30 PM
104	NO	7/6/2021 4:28 PM
105	no	7/6/2021 4:20 PM
106	NO	7/6/2021 4:16 PM
107	NO	7/6/2021 4:14 PM
108	no	7/6/2021 4:10 PM
109	NO	7/6/2021 4:01 PM
110	NO	7/6/2021 4:01 PM
111	NO	7/6/2021 3:58 PM
112	NO	7/6/2021 3:52 PM
113	NO	7/6/2021 3:47 PM
114	NO	7/6/2021 3:46 PM
115	no	7/6/2021 3:43 PM
116	NO	7/6/2021 3:34 PM
117	no	7/6/2021 3:32 PM
118	no	7/6/2021 3:23 PM
119	no	7/6/2021 3:06 PM
120	NO	7/6/2021 2:54 PM
121	no	7/6/2021 2:52 PM
122	NO	7/6/2021 2:46 PM
123	no	7/6/2021 2:42 PM
124	NO	7/6/2021 2:42 PM
125	NO	7/6/2021 2:34 PM
126	NO	7/6/2021 2:29 PM
127	NO	7/6/2021 2:26 PM
128	no	7/6/2021 2:26 PM
129	NO	7/6/2021 2:15 PM
130	NO	7/6/2021 2:15 PM
131	NO	7/6/2021 2:09 PM
132	NO	7/6/2021 2:05 PM
133	NO	7/6/2021 1:55 PM
134	NO	7/6/2021 1:55 PM

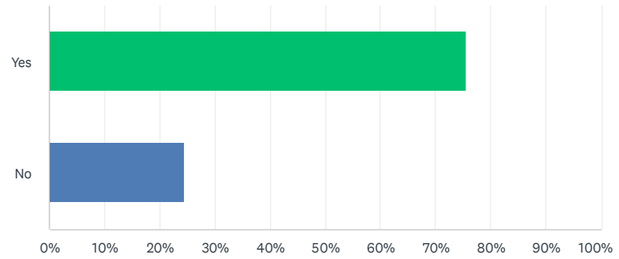
City of Chico Urban Forest Master Plan Survey

135	NO	7/6/2021 1:54 PM
136	NO	7/6/2021 1:42 PM
137	The guards are expected to patrol at irregular intervals	7/6/2021 1:27 PM
138	NO	7/6/2021 1:27 PM
139	NO	7/6/2021 1:15 PM
140	NO	7/6/2021 1:08 PM
141	NO	7/6/2021 1:06 PM
142	NO	7/6/2021 1:01 PM
143	NO	7/6/2021 12:38 PM
144	I have a small home in the aves that had 2 giant tulip trees and 15 or so other smaller trees- I've already replaced my sewer line abd the cost of watering is very high and difficult during extreme drought. I would like to remove some of the smaller trees and add drought resistant foliage and growth- cost is too much. Grants or assistance planning would be great.	7/6/2021 12:38 PM
145	NO	7/6/2021 12:34 PM
146	My biggest concern is the large trees that overhang the roadway.	7/6/2021 11:40 AM
147	I have questions regarding trees in my neighborhood	7/4/2021 5:35 PM
148	Get funding to make Bidwell Park Fire Resistant	7/4/2021 7:32 AM
149	thanks for a[redacted]good survey!!! who do we have an Urban Forester these days??? to whom do we address our suggestions for the tree section of our city website???	7/3/2021 6:50 PM
150	Don't cut the trees lining the Esplanade	7/3/2021 5:03 PM
151	PG&E needs to be watched and not allowed to cut down trees unless condemned by the Urban Forester or an arborist. They have eliminated a lot of street trees.	7/3/2021 4:26 PM
152	As we are suffering in drought it is hard to see neighbors and others in this community stop watering their yards. I am happy to see lawns die but wish folks could be more educated on how to water the trees to maintain our canopy. All this cement work along Park Ave and their doesnt seem to be a plan for adding trees. The current ones are far from healthy or sufficient to make shade. Walking on park ave in the summer even as early as 9am it is sooooo hot.	7/3/2021 4:21 PM

City of Chico Urban Forest Master Plan Survey

Q20 Do you work in Chico?

Answered: 282 Skipped: 34

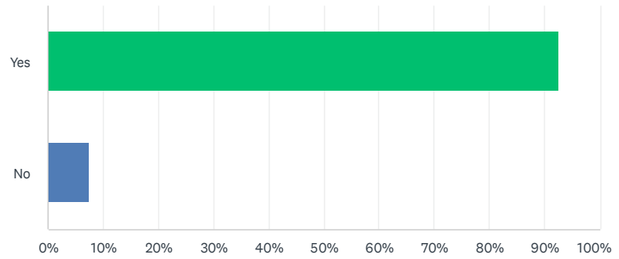


ANSWER CHOICES	RESPONSES	
Yes	75.53%	213
No	24.47%	69
TOTAL		282

City of Chico Urban Forest Master Plan Survey

Q21 Do you live in Chico?

Answered: 284 Skipped: 32



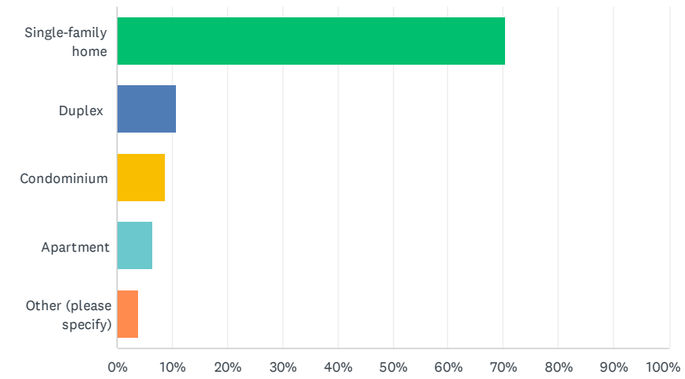
ANSWER CHOICES	RESPONSES	
Yes	92.61%	263
No	7.39%	21
TOTAL		284

Q22 What is your 5-digit zipcode?

Answered: 277 Skipped: 39

Q23 Which of the following best describes your housing type?

Answered: 284 Skipped: 32

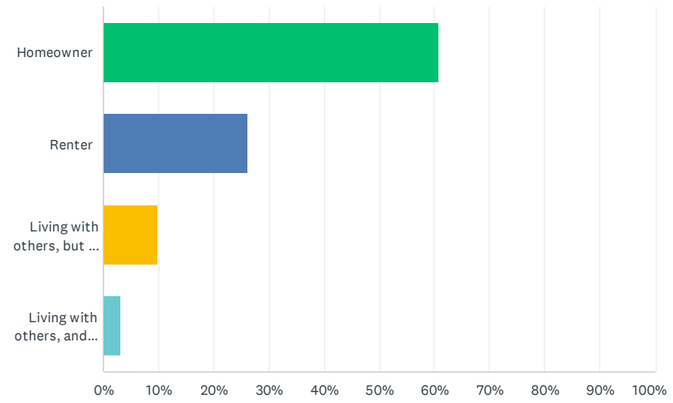


ANSWER CHOICES	RESPONSES	
Single-family home	70.42%	200
Duplex	10.56%	30
Condominium	8.80%	25
Apartment	6.34%	18
Other (please specify)	3.87%	11
TOTAL		284

#	OTHER (PLEASE SPECIFY)	DATE
1	NA	9/21/2021 12:33 PM
2	trailer	8/16/2021 9:04 PM
3	I am homeless, living in my van	7/27/2021 5:04 PM
4	Just moved here	7/26/2021 11:58 PM
5	Mobile home in seniors only community	7/26/2021 2:49 PM
6	Decline to state	7/25/2021 6:00 AM
7	decline to state for others' privacy	7/20/2021 1:29 PM
8	n/a	7/19/2021 9:40 PM
9	Room rental with other roommates	7/19/2021 4:28 PM
10	Technically a triplex, but practically subdivided between the street and the alley.	7/15/2021 3:45 PM
11	cooperative multi-person household	7/10/2021 2:34 PM

Q24 Which of the following best describes your current housing situation?

Answered: 278 Skipped: 38



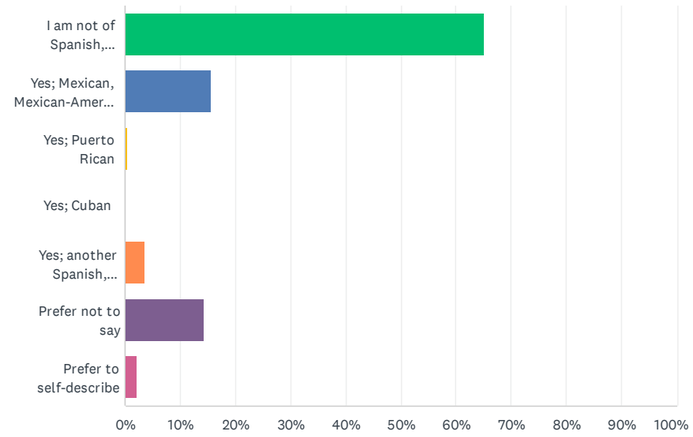
ANSWER CHOICES	RESPONSES	
Homeowner	60.79%	169
Renter	26.26%	73
Living with others, but not paying rent or mortgage	9.71%	27
Living with others, and paying a portion of rent or mortgage	3.24%	9
TOTAL		278

#	IF OTHER, PLEASE SPECIFY.	DATE
1	Lost home in Campfire	8/25/2021 11:02 PM
2	Rebuilt home after 40 years in Paradise	8/3/2021 3:23 PM
3	unhoused	7/27/2021 5:04 PM
4	Just moved here	7/26/2021 11:58 PM
5	Mobile home owner AND rent the place it sits on.	7/26/2021 2:49 PM
6	Our homeless neighbors need shade,especially in this awful, long heat wave. The city shold provide a shaded camp ground for them.	7/25/2021 7:43 AM
7	Decline to state	7/25/2021 6:00 AM
8	n/a	7/19/2021 9:34 PM

City of Chico Urban Forest Master Plan Survey

Q25 Are you of Hispanic, Latino/a/x, or Spanish origin? Check all that apply.

Answered: 281 Skipped: 35

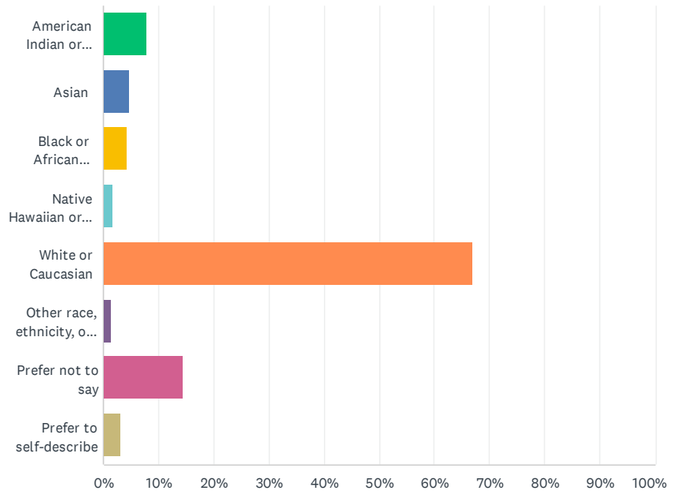


ANSWER CHOICES	RESPONSES	
I am not of Spanish, Hispanic, or Latino/a/x origin	65.12%	183
Yes; Mexican, Mexican-American, Chicano/a/x	15.66%	44
Yes; Puerto Rican	0.36%	1
Yes; Cuban	0.00%	0
Yes; another Spanish, Hispanic, or Latino/a/x origin	3.56%	10
Prefer not to say	14.23%	40
Prefer to self-describe	2.14%	6
Total Respondents: 281		

#	PREFER TO SELF-DESCRIBE	DATE
1	I'm an American, that's all that matters. An I love the country I live in.	8/2/2021 1:08 AM
2	How does my heritage have any effect on trees?	7/28/2021 8:04 AM
3	Human	7/27/2021 6:48 PM
4	American	7/27/2021 8:41 AM
5	English/White	7/19/2021 9:24 PM
6	Peruvian/German	7/10/2021 2:34 PM

Q26 Which of the following best describes you? Check all that apply.

Answered: 282 Skipped: 34



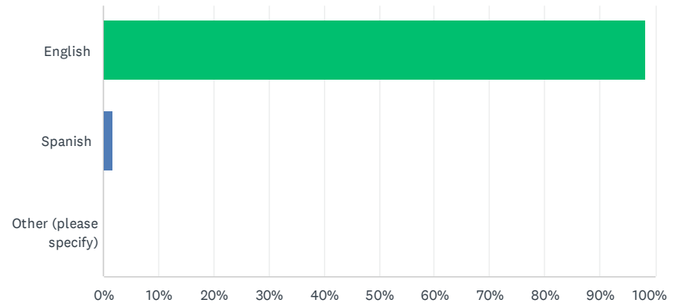
ANSWER CHOICES	RESPONSES	
American Indian or Alaskan Native	7.80%	22
Asian	4.61%	13
Black or African American	4.26%	12
Native Hawaiian or other Pacific Islander	1.77%	5
White or Caucasian	67.02%	189
Other race, ethnicity, or origin	1.42%	4
Prefer not to say	14.54%	41
Prefer to self-describe	3.19%	9
Total Respondents: 282		

#	PREFER TO SELF-DESCRIBE	DATE
1	Euro-American	9/10/2021 7:40 PM
2	I am related to the Choctaw. I also come from Irish decent. My family dates back to at least before the 19th century. I am also part German from my father's side.	8/2/2021 1:08 AM
3	Once again, how does my heritage have any effect on trees?	7/28/2021 8:04 AM

4	Human	7/27/2021 6:48 PM
5	Husband and Father	7/27/2021 8:41 AM
6	Very mixed	7/19/2021 10:06 PM
7	Portuguese and Spanish	7/12/2021 8:43 AM
8	Peruvian/German	7/10/2021 2:34 PM
9	Chicano/First Nations	7/3/2021 6:55 PM

Q27 What is the primary language spoken in your home?

Answered: 281 Skipped: 35



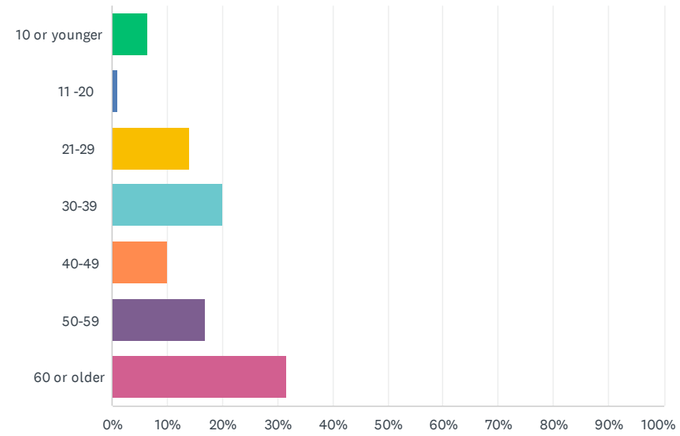
ANSWER CHOICES	RESPONSES	
English	98.22%	276
Spanish	1.78%	5
Other (please specify)	0.00%	0
TOTAL		281

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

City of Chico Urban Forest Master Plan Survey

Q28 What is your age?

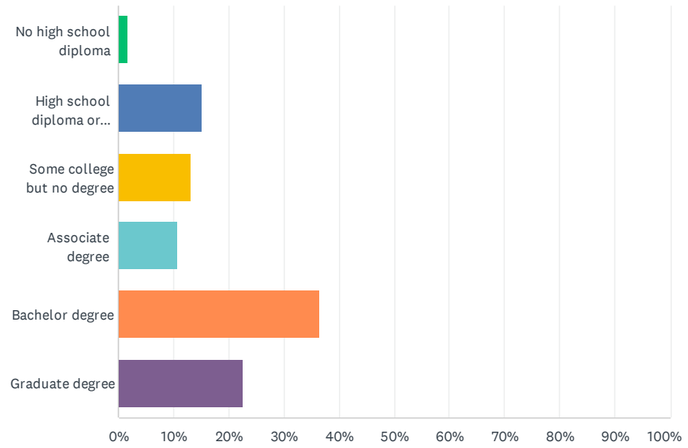
Answered: 279 Skipped: 37



ANSWER CHOICES	RESPONSES	
10 or younger	6.45%	18
11 -20	1.08%	3
21-29	13.98%	39
30-39	20.07%	56
40-49	10.04%	28
50-59	16.85%	47
60 or older	31.54%	88
TOTAL		279

Q29 What is the highest level of education you have attained?

Answered: 279 Skipped: 37



ANSWER CHOICES	RESPONSES	
No high school diploma	1.79%	5
High school diploma or equivalent (e.g., GED)	15.05%	42
Some college but no degree	13.26%	37
Associate degree	10.75%	30
Bachelor degree	36.56%	102
Graduate degree	22.58%	63
TOTAL		279

APPENDIX D

Sidewalk Solutions

Tree and Sidewalk Conflict Solutions

Trees and sidewalks are both key pieces of urban infrastructure that contribute to the pedestrian environment. Both contribute to the character and sense of place in a community as well as provide health and economic benefits while offering a means for comfortable active transportation. However, these two elements of the public streetscape are often in conflict with one another. Sidewalks and other hardscapes can preclude healthy tree growth and canopy development by limiting available soil volume, while tree roots often cause damage to sidewalks resulting in uplift and fall and trip hazards which can be costly to repair. These conflicts and the associated costs often overshadow the benefits provided by trees in the urban landscape, resulting in the removal of trees or the decision to avoid planting trees altogether. In reality, tree and infrastructure conflicts are due to inadequate site design and exacerbated by planting the wrong tree species for the allotted space. The cost of sidewalk repairs or removing and replacing trees is a significant investment that can be avoided with proper site design and species selection. There are a number of strategies for minimizing, avoiding or eliminating tree and sidewalk conflicts that can be employed by local or regional governments. Table 1 outlines tree and sidewalk conflict resolution tactics and design solutions that can be employed when replacing damaged sidewalks or installing new sidewalks. Employing these strategies is dependent upon policies, standards and design requirements, clear processes for implementation, and funding.

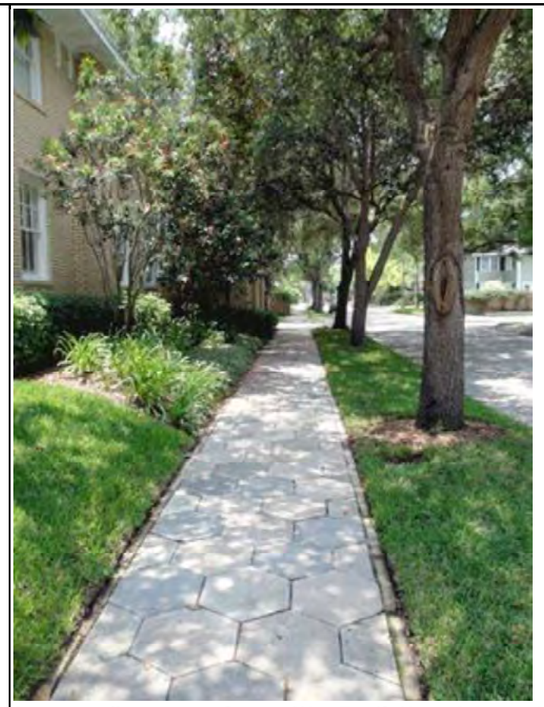
Local jurisdictions are required to abide by federal and state policies governing sidewalk design, such as the US Access Board Public Right-of-Way Accessibility Guidelines (PROWAG), Americans with Disabilities Act (ADA), and the California Building Code (CBC). Additionally, local jurisdictions can adopt local policies, standards, and plans that guide the management of trees and sidewalks. Examples include tree protection ordinances, street tree and sidewalk design requirements, tree planting standards and specifications, street tree lists, and long-range plans, such as urban forest management plans, bicycle and pedestrian plans/active transportation plans, the General Plan, and specific plans.

In order to successfully implement tree and sidewalk policies and standards, cities must have processes in place for implementation and maintenance, including review of development plans and strict code enforcement. If not managed within the same department, city departments managing street trees and sidewalks must maintain clear lines of communication and collaborate regularly. Approaching management of street trees and sidewalks within the same department can prove successful, as collaboration is easily facilitated. Forestry staff and engineers can jointly inspect conflicts or conduct plan review and work together to identify solutions. A formalized process will help guide these actions, such as outlined in the City of Seattle's; many of the solutions provided in Table 1 are based on the Toolkit included in Trees and Sidewalks Operations.

Cities must have reliable funding for management and oversight of its tree and sidewalk programs in order to successfully resolve or avoid conflicts. This includes funding for staff, tree planting, plan review, inspection and code enforcement, and maintenance and repairs. Examples of possible revenue streams to fund forestry and sidewalk programs include allocations from the general fund, partnering with nonprofit organizations, or allocations from taxes or fees, such as a gas tax, utility tax or development impact fees. Additional funding may also come from less traditional approaches, such as establishing a City nursery or composting program and offering these products for sale.

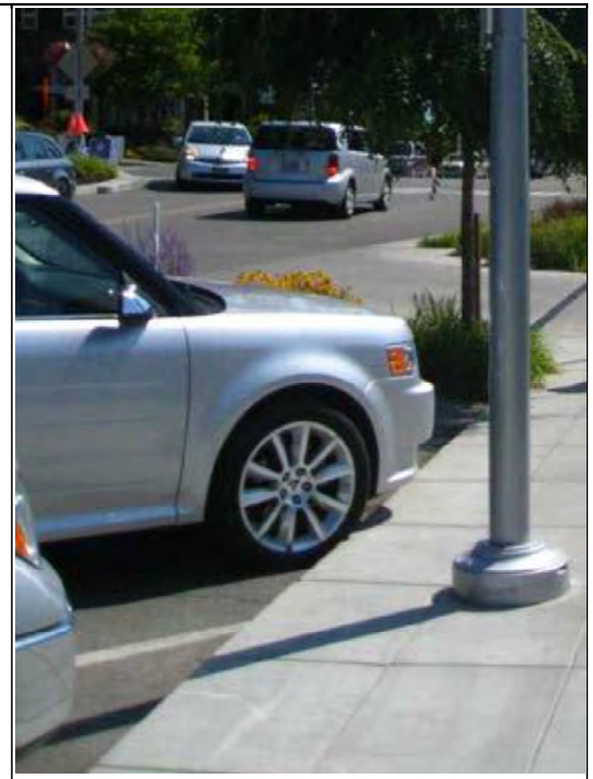
Table 1. Tree and Sidewalk Conflict Solutions

Solution Type	Pros	Cons	Estimated Cost ($–$$$$)	Useful Life (Years-Decades-Centuries)	Example Image
Materials					
The following sidewalk solutions present various materials for replacement/repair of a damaged sidewalk that may be used instead of concrete.					
Asphalt	• Short-term to medium-term solution • Low initial cost • More flexible than concrete • May be used as a repair/replacement or for new sidewalks • Easily repaired	• Not widely used, creating conflicts with appearance and visual character • Useful life can vary greatly • Useful life shorter than that concrete	$$ ($22 per linear foot)	Decades	 Image Source: Seattle Department of Transportation

Pavers	• Many types, materials, and colors available • More flexible than concrete, providing room for continued tree root growth • May be used as temporary repair or replacement, or when installing new sidewalk at the same time as trees	• Requires cutting to fit around other infrastructure (e.g., utilities, etc.) • Not all available types and materials are suitable for all locations, as required depth of excavation may vary • Durability varies by type	$$–$$$ ($10 to $50 per square foot)	Decades	 Image Source: Carroll's Building Materials n.d.
Pervious Concrete	• Allows air and water to reach soil • May encourage deeper root growth and deter shallow root growth, reducing root damage to sidewalks • Provides better growing conditions	• Requires deeper excavation for installation of subbase layers • Requires more maintenance than standard concrete	$$$–$$$$ ($35 per linear foot)	Decades	 Image Source: Bay Area Pervious Concrete

Porous Asphalt	• Allows water to pass through to soil • May be used for replacement of large segments of sidewalk or installation of new sidewalks where infiltration is desirable (e.g., adjacent to bioretention)	• Cannot be produced in small quantities and should only be used when long sidewalk segments are being installed (e.g., multiple blocks)	$–$$$ ($30 per linear foot)	Decades	 Image Source: Porous Pave
Decomposed Granite	• May be used as a pathway or walkway surface, or as a finished surface on top of planting soil in tree pits rather than mulch • Provides flexible but walkable surface near tree roots • Best used in parks on walking and cycling paths, or similar settings • May be used as a temporary repair near root zones or for installation of new pathways or walkways	• Not recommended for busy pedestrian routes (best in residential areas) • Requires more maintenance than asphalt or concrete, as uneven settling can occur • Americans with Disabilities Act compliance may require binders and regular maintenance	$–$$ ($12 per linear foot)	Years	 Image Source: Bike Orlando
Alternative Sidewalk Design Construction Methods					
The following sidewalk solutions present alternative sidewalk design and construction methods to better accommodate trees and resist damage to sidewalks.					

Reinforced or Thicker Slab	• Reinforcing concrete with steel rebar or wire mesh and/or using a thicker slab helps resist uplift of tree roots • May be used to correct uplift after other corrective actions have been taken	• May not be compatible with future utility installation • Should not be used where additional root growth is anticipated (i.e., sufficient soil volume should be provided)	$$–$$$ ($60 per linear foot for reinforced slab and $40 per linear foot for 4-inch thickness)	Decades	 Image Source: E. F. Gilman
Expansion Joints	• Allow for some movement of concrete • Used to control the location of cracking • May be used as repair or replacement or for new sidewalks near existing trees (where roots may be pruned prior to installation and substantial root growth is not anticipated)	• Should not be used where significant additional root growth is anticipated (i.e., sufficient soil volume should be provided) • Short term solution	$ (varies)	Decades	 Image Source: S. Kubiak and V. Kubiak

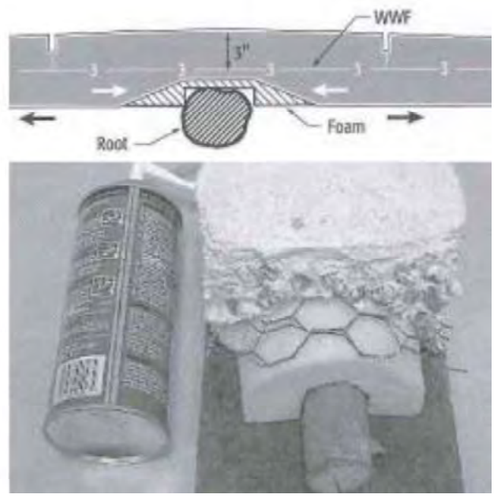
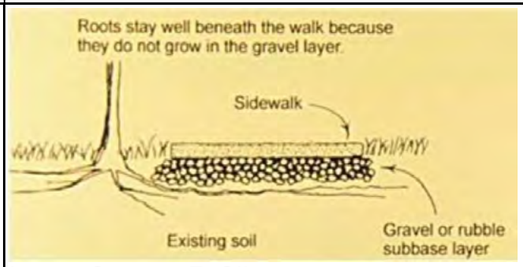
Monolithic Sidewalk	• The continuous installation of concrete with no grade change between sidewalk and street has greater weight (mass) to resist tree root uplift • Reduces potential for future weakness in pavement infrastructure • May be used in new development and in redevelopment	• Consideration must be given to impacts related to stormwater runoff and drainage patterns • Not ideal for areas where new root growth is expected (new plantings or continued growth)	$$$ ($60 per linear foot)	Century	 Image Source: Seattle Department of Transportation
Tree Pits/Expanded Tree Pits	• Alternative to planting strips where maintaining sidewalk width is important (e.g., business districts) • May be used in new development where tree pit sizing and tree selection are coordinated (“right tree, right place”) or in existing development where sufficient space is	• Must establish minimum sizing requirements to ensure adequate soil volume • Continuous planter strips are preferred where feasible	$ ($15 per square yard for widening existing tree pits. No additional cost if implemented in new	Decades	

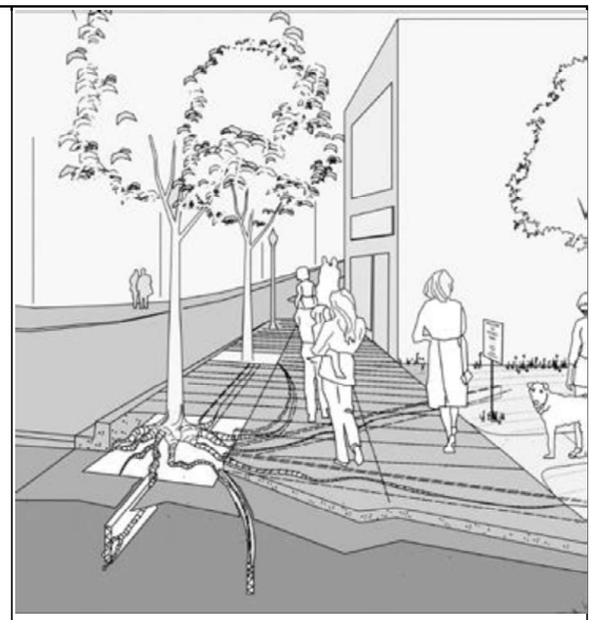
	available to expand existing tree pits		development design)		 Image Source: City of Chico Public Works O&M
Bridging	• Provides grade separation between tree root zone and sidewalk • Does not require compacted subgrade allowing tree roots to grow in soil • Variety of materials can be used such as concrete or steel panels • May be used as repair or replacement of damaged sidewalk or to preserve a high value tree	• Site specific grading requirements may prevent use of this technique • A nonslip surface treatment is required for metal/steel materials • Additional Americans with Disabilities Act requirements related to grade differentials greater than 18 inches	$$$$ ($225 per linear foot)	Decades	 Image Source: E. Gilman

Curb Extensions (Bulb-Outs)	• Increases pedestrian safety through traffic calming and shortening the crossing distance for pedestrians • Provides additional root growth area reducing likelihood of root damage to sidewalks • Provides flexibility for tree species selection • May be used in new development or as expansion of sidewalks and planting space in redevelopment	• Must consider impacts to drainage and existing utilities • Must consider site specific transportation conditions or impacts, including driver sight lines as well as bicycle and pedestrian facilities	$$$–$$$$ ($50 per linear foot excluding drainage and ramps)	Century	 Image Source: Dylan Passmore
Curb Realignment	• Shifts curb location to widen the planting strip • May be used for new development or redevelopment to provide additional space for new or existing trees	• Requires sufficient street widths • Must consider impacts to other infrastructure and utilities • Must consider site specific transportation conditions or impacts	$$$–$$$$ ($50 per linear foot excluding drainage modification and ramps Minimal additional cost if part of new developmen t design)	Century	 Image Source: Seattle Department of Transportation

Curving or Offset Sidewalk	• Allows for walkways that meander around planting areas, allowing trees more grow space • Increases pedestrian safety by separating sidewalks from vehicular traffic • May be used in new development or redevelopment to preserve existing trees or to provide sufficient grow space for new plantings	• Requires adequate space in the right of way • May require easement for use of private property	$$–$$$ ($38 per linear foot)		 Image Source: City of Chico Public Works O&M
Easement	• May allow for use of private property where additional space is needed • Provides larger planting area for new or existing trees	• Requires coordination with property owner	$–$$$ (Varies based on market value or dedication from property owner)	Century	 Image Source: City of Chico Public Works O&M
Suspended Pavement Systems	• Provides space and soil volume for new tree plantings in areas that could not have supported tree root growth.	• Involves removing and repaving sidewalks if they already exist in the areas • Site specific grading requirements need to	$$$–$$$$ (15-$25/cubic foot)	Decades	

	• Prevents root damage to pavement if implemented at the correct time	be taken into consideration			 Image Source: DeepRoot
Lowered Tree Sites	• Can help prevent soil compaction due to pedestrian traffic • Can bring trees to streets with limited planting space and few underground infrastructure conflicts	• Can conflict with underground infrastructure; can only be implemented in areas that have limited potential for conflict • Lowered sites tend to accumulate trash and other debris, presenting a maintenance issue • Design must include a drainage plan because soil can be easily oversaturated	$$$–$$$$	Decades	 Image Source: Storm Tree
Root					
The following sidewalk solutions present design solutions that specifically address tree roots.					

Root Barriers	• Deters root growth to limit damage to pavement • May be added after tree planting to retrofit or address root issues	• Will not address all issues from tree roots, but will help deter	$ ($8 per linear foot)	Decades	 Image Source: Advanced Exacta Sales Inc.
Foam Underlay	• Provides a foam layer of support between pavement and tree roots to help prevent damage • Can offer an alternative to root pruning when a sidewalk needs to be replaced but root pruning would severely damage the tree • Best used to repair damage caused by mature tree roots	• Short term solution • Not a good option for tree species that have rapid root growth	$–$$ ($150 to $250 per location)	Years	 Image Source: Costello and Jones
Modified Gravel Layer	• Suppressed root growth • More longevity than foam underlay and serves the same purpose • Thickness of gravel around roots can be adjusted to accommodate size	• Could wound tree roots making the trees more susceptible to soilborne pathogens • 4 inches of gravel is needed, if excavation would damage critical existing roots • Modified Gravel Layer may not be an option	$ ($0.70 per square foot at depth of 4 inches)	Decades	 Image Source: E. Gilman

Root Paths	• Can proactively direct paths for roots to grow, when designed at the beginning of planting • Help direct roots around utilities when planting space is limited	• Drainage away from or out of root path will need to be considered	$–$$ ($600 to $800 per tree)	Decades	 Image Source: Seattle Department of Transportation
Steel Plates	• Can be used as an alternative to root pruning • Can be used to help mitigate issues with roots that have already developed (reactionary)	• Can conflict with underground utilities • Requires sidewalk to be removed and replaced for installation	$$–$$$ ($500 to $1,000 per site)	Decades	 Image Source: Gordan Mann

Sources:

American Planning Association. 2009. Planning the Urban Forest: Ecology, Economy, and Community Development. Planning Advisory Service Report Number 555.

Bassuk et al. 2015; Bike Orlando 2020; Casey Trees 2008; Costello and Jones 2003; Elmendorf 2008; City of New York Parks & Recreation 2014; City of Seattle 2011; City of Seattle Department of Transportation 2014, 2015; City of Seattle Public Utilities 2015; Mann n.d.; Smiley 2008

Bassuk, N., Denig, B., Haffner, T. Grabosky, J., and Trowbridge, P. 2015. CU-Structural Soil ®: A Comprehensive Guide. Urban Horticulture Institute, Cornell University. http://www.hort.cornell.edu/uhi/outreach/pdfs/CU-Structural%20Soil%20-%20A%20Comprehensive%20Guide.pdf.

Bike Orlando. 2020. Ward Park, Winter Park, FL Biking, Hiking. E-Z Map, 35+ Photos. Accessed May 2021. https://www.bikeorlando.net/ward-park-winter-park.htm.

Casey Trees. 2008. *Tree Space Design: Growing the Tree Out of The Box*. Accessed May 2021. http://caseytrees.org/resources/publications/treespacedesign/.

Carroll's Building Materials. n.d. "Classic Hexagon Pavers." Accessed May 2021. https://carrollsbuildingmaterials.com/landscape-products/pavers-profiles-finishes/classic-hexagon-pavers/.

Costello, L. R. and K. S. Jones. 2003. *Reducing Infrastructure Damage By Tree Roots: A Compendium of Strategies*. Western Chapter of the International Society of Arboriculture.

Elmendorf, W. 2008. Planting and Aftercare of Community Trees. Penn State University Extension.

City of New York Parks & Recreation. February 2014. Tree Planting Standards. Accessed May 2021. http://www.nycgovparks.org/pagefiles/53/Tree-Planting-Standards.pdf.

City of Seattle. 2011. *Seattle Right-of-Way Improvements Manual*. https://www.seattle.gov/rowmanual/manual/.

City of Seattle Department of Transportation. 2014. *Street Tree Manual*. Accessed May 2021. http://www.seattle.gov/documents/departments/sdot/about/documentlibrary/streettreemanualweb.pdf.

City of Seattle Department of Transportation. 2015. *Tree Sidewalks Operations Plan*. City of Seattle Public Utilities. 2015. Standard Specifications of Municipal Construction. Plans 100a, 421, 424, 425, 430.

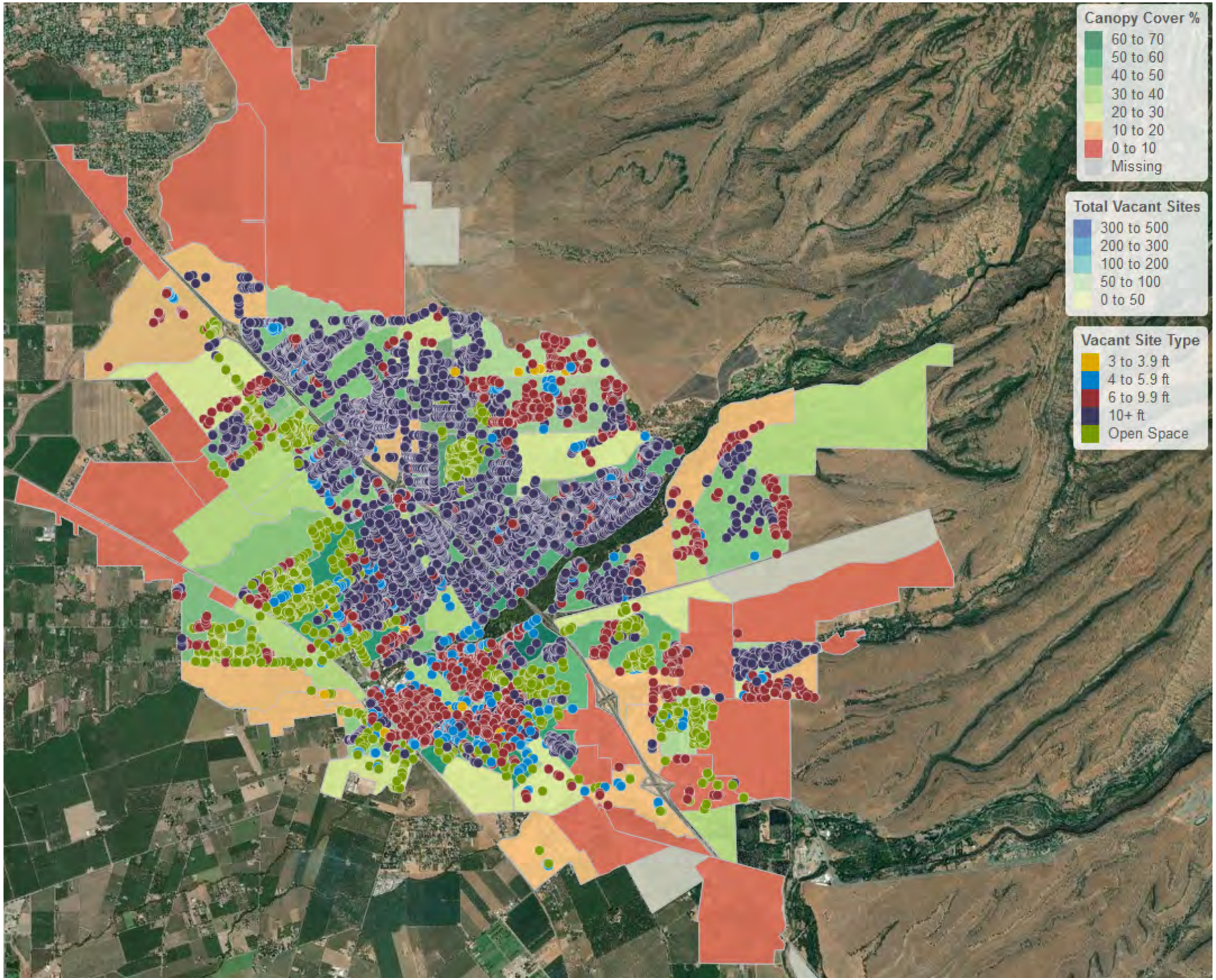
Mann, Gordon. N.d. Sidewalk and Root Conflicts: Mitigating the Conflict - An Overview. Accessed May 2021, on Municipal Research and Services Center (MRSC) website at: http://mrsc.org/getmedia/4DD1A628-BD5A-49E3-B1EE-3D09525F63BE/m58mannmade.asp.

Martin, Justin. 2017. Trees and Sidewalks: A Strategic Approach to Conflicts. Green Infrastructure for Your Community. https://www.deeproot.com/blog/blog-entries/trees-and-sidewalks-a-strategic-approach-to-conflicts

Smiley, E. Thomas. 2008. "Comparison of Methods to Reduce Sidewalk Damage from Tree Roots," inArboriculture & Urban Forestry 34(3):179-183.

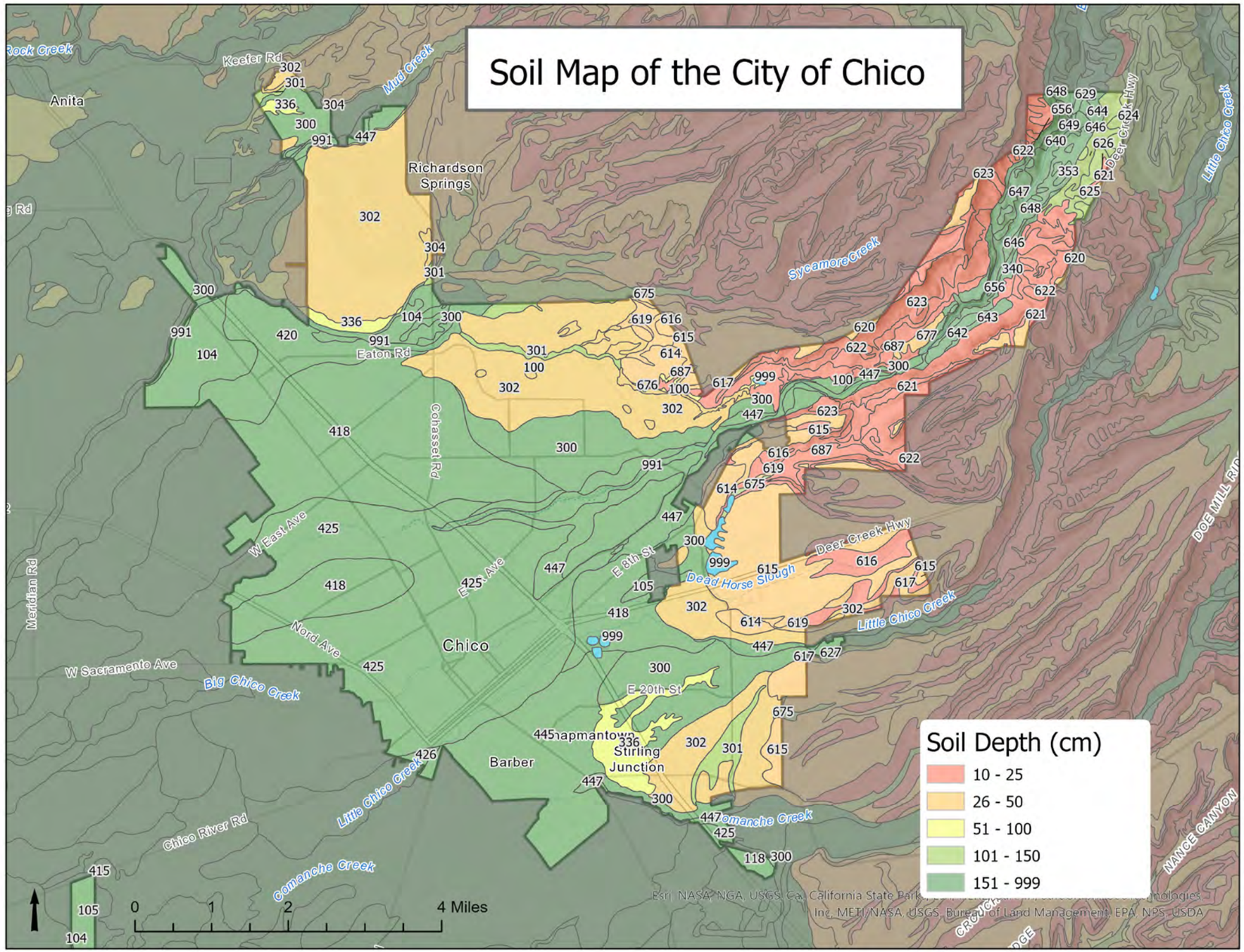
APPENDIX E

Street Tree Planting Plan


Canopy Cover %
60 to 70
50 to 60
40 to 50
30 to 40
20 to 30
10 to 20
0 to 10
Missing
Total Vacant Sites
300 to 500
200 to 300
100 to 200
50 to 100
0 to 50
Vacant Site Type
3 to 3.9 ft
4 to 5.9 ft
6 to 9.9 ft
10+ ft
Open Space

APPENDIX F

Soils Map


Soil Map of the City of Chico
Soil Depth (cm)
10 - 25
26 - 50
51 - 100
101 - 150
151 - 999
Keefer Rd
Mud Creek
Anita
Richardson Springs
Sycamore Creek
Eaton Rd
Cohasset Rd
Deer Creek Hwy
Dead Horse Slough
Little Chico Creek
Doe Mill Rd
W East Ave
E 8th St
E 20th St
Meridian Rd
Nord Ave
W Sacramento Ave
Big Chico Creek
Chico
Stirling Junction
Barber
Chapmantown
Chico River Rd
Comanche Creek
Nance Canyon
0 1 2 4 Miles
Esri, NASA, NGA, USGS, Ca, California State Park
Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA

APPENDIX G

Notice of Exemption

City of Chico Urban Forest Revitalization Program 17-GHG-UF-01-MGMT-0048 "8GG17406"

Summary

SCH Number	2019028027
Public Agency	California Department of Forestry and Fire Protection (CAL FIRE)
Document Title	City of Chico Urban Forest Revitalization Program 17-GHG-UF-01-MGMT-0048 "8GG17406"
Document Type	NOE - Notice of Exemption
Received	2/1/2019
Posted	2/1/2019
Document Description	Chico's Public Works Department will develop an up-to-date, accurate and complete street tree inventory. A comprehensive urban forest management plan will be developed including an urban tree canopy analysis that will enhance and expand the city's urban forest into the next half-century. The city will use developed computer software to evaluate cost and benefit investment values needed to manage and care for the urban forest, and review and update city ordinances, policies, and procedures. The city will engage in community outreach to assist in developing goals for its urban forest resource. The city will update and renew the Heritage Tree Program. The city will leverage its own organizational structure with support from various partners including local non-profits and volunteers to plant and maintain 700 trees.

Contact Information

Name	Robert Little / Julia Bartens
Agency Name	Cal Fire
Contact Types	Lead/Public Agency
Address	P.O. Box 944246 Sacramento, CA 94244-2460
Phone	(916) 657-2289

Location

Cities	Chico

Notice of Exemption

Exempt Status	Categorical Exemption
Type, Section or Code	Class 4, & 6
Reasons for Exemption	This project fits under portions of Class 4-Minor Alterations to Land and Class 6, Information Collection. Review by CAL FIRE staff confirmed that no exceptions apply that would preclude the use of a notice of exemption for this project. The department has concluded that no significant environmental impact would occur to aesthetics, agriculture and forestland or timberland, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use planning mineral resources, noise, population and housing, public services, recreation, transportation or traffic, or to utilities and service systems. Class 6 consists of basic data collection, research, experimental management and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. Documentation of the environmental review completed by the Department is kept on file at CAL FIRE Headquarters, 1416 Ninth Street, Sacramento, CA.

Disclaimer: The document was originally posted before CEQAnet had the capability to host attachments for the public. To obtain the original attachments for this document, please contact the lead agency at the contact information listed above. You may also contact the OPR via email at state.clearinghouse@opr.ca.gov or via phone at (916) 445-0613.

APPENDIX H

Tree Species Recommendations

Appendix H Recommended Species List

Genus	Species	Common Name	*Foliage	**Size	Height (Feet)	Crown Spread (Feet)	Spacing between Trees (Feet)	Minimum Parkway Width (Feet)	Utility Friendly	***WUCOLS Rating	Regionally Native	Residential	Commercial	Park	USDA Hardiness Zone	Western Sunset Zone
Acer	*buergerianum*	trident maple	D	S	25	20–25	15–20	5–10	Yes	M/M	No	X	X	X	5–10	2–9, 14–17, 20–21
Aesculus	*californica*	California buckeye	D	S	25	20–30	15–20	4–6	Yes	VL	No	X	X	X	7,8	3–10, 14–24
Aesculus	× *carnea*	red horse-chestnut	D	M	50	30–50	30–35	>10	No	M/M	No	X	X	X	4–8	1–10, 12, 14–17
Arbutus	*unedo*	strawberry madrone	E	M	20–35	20–35	20–25	3–4	Yes	L	No	X	X		8–11	4–24
Arbutus	marina	marina madrone	E	M	40–50	40	30–35	6–8	No	L	No	X		X	9–11	8–9, 14–24
Brachychiton	*populneus*	kurrajong	E	M	30–50	30	30–35	4–6	No	L	No	X		X	8–11	12–24
Calocedrus	*decurrens*	incense cedar	E	L	90	10–15	15–20	6–8	No	M/M	Yes			X	5–8	2–12, 14–24
Carpinus	*betulus*	European hornbeam	D	M	40	20–30	15–20	6–8	No	M/M	No	X	X	X	4–8	2–9, 14–17
Carpinus	*caroliniana*	American hornbeam	D	M	35	20–30	15–20	5–10	No	M/M	No	X	X		3–9	1–9, 14–17
Cassia	*leptophylla*	gold medallion tree	E	S	25	20–40	30–35	5–10	Yes	L	No	X	X		10–12	15–16, 20–24
Celtis	*australis*	European hackberry	D	L	70	40–50	30–35	6–8	No	Low	No			X	6–8	8–16, 18–20
Cercis	*canadensis*	eastern redbud	D	M	35	25–35	15–20	5–10	No	M/M	No	X	X		5–9	1–24
Cercis	*occidentalis*	western redbud	D	S	20	10–20	20–25	3–4	Yes	VL	Yes	X	X		7–9	2–24
Chionanthus	*retusus*	Chinese fringe tree	D	S	20	6–12	5–10	3–4	Yes	M/M	No	X	X		6–8	3–9, 14–24
Chitalpa	*tashkentensis*	chitalpa	D	M	35	30	15–20	4–6	No	L	No	X	X		7–9	3–24
Cornus	*controversa*	giant dogwood	D	L	60	40–60	30–35	>10	No	M/M	No	X	X		6–9	4–9, 14, 18–19
Cornus	*kousa*	Korean dogwood	D	S	25	15–20	10–15	5–10	Yes	M/M	No	X	X		5–8	2–9, 14–17
Eriobotrya	*japonicum*	Japanese loquat	E	M	30	15–30	10–15	3–4	Yes	L	No	X	X		8–10	6–24
Geijera	*parviflora*	Australian willow	E	M	35	20	30–35	6–8	No	L	No		X	X	9–11	8–9, 12–24
Ginkgo	*biloba*	maidenhair tree	D	L	65	25	15–20	6–8	No	M/M	No	X	X	X	5–9	1–10, 12, 14–24
Gymnocladus	*dioicus*	Kentucky coffee	D	L	100	40–50	30–35	>10	No	M/M	No	X	X		5–9	1–3, 7–10, 12–16, 18–21
Heteromeles	*arbutifolia*	toyon	E	S	25	8–15	5–10	3–4	Yes	L	Yes	X	X		9–11	5–9, 14–24
Koelreuteria	*bipinnata*	Chinese flame	D	M	20–40	20–40	30–35	6–8	No	M/M	No	X	X		7–9	8–24
Koelreuteria	*paniculata*	goldenrain	D	M	20–40	20–40	30–35	4–6	No	M/M	No	X	X	X	6–9	2–24
Laurus	*nobilis*	sweet bay	E	M	15–40	15–30	20–25	3–4	No	L	No		X	X	8–10	5–9, 12–24
Lophostemon	*conferta*	Brisbane box	E	M	20–40	20–40	30–35	4–6	No	M/M	No			X	10–11	15–17, 19–24
Magnolia	*grandiflora* “Little Gem”	little gem magnolia	E	S	20	10	5–10	2–5	Yes	M/M	No	X	X		5–9	4–12, 14–24
Magnolia	*soulangeana*	saucer magnolia	D	S	25	25	15–20	5–10	Yes	M/M	No	X	X		5–9	2–10, 12–24
Olea	*europaea* “swan hill”	swan hill olive	E	M	20–40	20	30–35	4–6	Yes	VL	No	X	X	X	8–10	8–9, 11–24
Quercus	*douglasii*	blue oak	D	L	65	40–50	30–35	6–8	No	VL	Yes			X	6–9	3–11, 14–24
Quercus	*kelloggii*	black oak	D	L	70	30–35	30–35	8+	No	L	No			X	7–9	5–7, 9, 14–21
Quercus	*muehlenbergii*	chinkapin oak	D	M	50	50–60	30–35	>10	No	L	No	X	X	X	3–9	2–12, 14–17
Quercus	*wislizeni*	interior live oak	E	L	70	40–80	30–35	6–8	No	VL	Yes			X	8–10	7–9, 14–16, 18–21
Quercus	*suber*	cork oak	E	M	20–40	20–40	30–35	4–6	No	L	No	X	X	X	8–10	5–16, 18–24
Quillaja	*saponaria*	soapbark tree	E	M	45	15–25	10–15	6–8	No	L	No	X		X	5–9	12–24
Robinia	purple robe’	purple robe locust	D	M	40	20–30	15–20	4–6	Yes	L	No	X		X	4–8	2–24
Styphnolobium	*japonicum*	Japanese pagoda	D	L	70	40–70	30–35	6–8	No	L	No			X	5–9	2–24
Styrax	*japonicus*	Japanese snowdrop tree	D	M	30	15–25	10–15	5–10	No	M/M	No	X			6–8	4–9, 14–21
Tilia	*americana*	American linden	D	M	40–65	20–25	15–20	>10	No	M/M	No	X	X	X	3–8	1–17
Tilia	*cordata*	littleleaf linden	D	M	50	15–30	20–25	>10	No	M/M	No	X	X	X	4–8	1–17
Ulmus	*davidiana* var. *japonica*	Japanese elm	D	M	55	25–35	15–20	6–8	No	L	No	X		X	5-9	3 - 24
Vitex	*agnus-castus*	chaste tree	D	S	15	15–20	10–15	3–4	Yes	L	No	X	X		6–10	4–24
Xylosma	*congestum*	shiny xylosma	E	S	10	8–15	5–10	3–4	Yes	L	No	X	X			8–24
Zelkova	*serrata*	sawleaf zelkova	D	L	50–65	50–65	30–35	6–8	No	L	No	X	X	X	5–9	3–21

* D = Deciduous, E = Evergreen, C = Conifer

** S = Small, M = Medium, L = Large

***VL = very low, L = low, M/M = Moderate/Medium, H = High

APPENDIX I

City Documents

City Documents Addressing Trees

Municipal Codes or Standards

Chapter 19.70 Design and Development Standards for Off-street Parking

GENERAL PARKING SPACE DESIGN AND LAYOUT STANDARDS
Page 10. Area of Shading Required. Trees shall be planted and maintained in planters or landscaped areas so that at tree maturity, 15 years, at least 50 percent of the total paving area, not including the entrance drives as depicted in Figure 5-11, parking areas under carports, or multi-story parking structures, shall be shaded at solar noon on June 21. This shading requirement shall not apply to the development of single family residences. On sites with compacted or poor soils and/or drainage, additional installation measures such as, but not limited to, soil amendments and over-excavation of planting holes, shall be required to ensure that the shading standard can be reached.
Page 10. Shaded parking lot area is determined by using an appropriate percentage of crown square footages as indicated in the Sunset Western Garden Book. Overlapping canopies shall not count towards the calculation number. Calculation Table. Landscape shading plans shall include a table that includes the following information: (1) Botanical name and common names of trees; (2) Total square feet of shade assumed for each tree; (3) Total parking lot area to be shaded; and (4) Total shade provided.
Page 11. Trees planted on the western perimeter of parking lots and in linear planters with a minimum width of six feet and a minimum length of 36 feet shall receive a 10 percent square foot shade bonus for each tree canopy
Page 11. Any planting, sign, or other structure within a sight distance area of a driveway shall not exceed 36 inches in height, with the exception of street trees.
Page 11. Planter Strips Between Parking Aisles. Planter strips and islands shall be, at a minimum, 6 feet wide, measured inside the curbing, in an amount to fulfill the 50 percent shading and parking landscaping requirement. Adequate pedestrian paths shall be provided throughout the landscaped areas. Clustering of trees may be approved by the Director or review authority

Chapter 16.68 Voluntary Heritage Tree Program

The purpose and intent of the Voluntary Heritage Tree Program is to identify, promote public awareness of, maintain, and protect designated trees within the City of Chico. This program acknowledges that Heritage Trees, whether located on public or private property, are distinct and unique living resources of the City of Chico.
The City Council may designate a tree as a Heritage Tree if it meets any of the following criteria: 1. Any native Oak (*Quercus*) species or Sycamore (*Platanus*) species, having a diameter at breast height of thirty-six (36) inches or greater when a single trunk, or a cumulative diameter of thirty-six (36) inches or greater when a multi-trunk, and with good health and structure; or 2. The tree is an outstanding specimen of a desirable species of good health and quality structure; or 3. The tree is of historical interest; or 4. The tree is an unusual species, is of distinctive form, is a part of a significant grove or is otherwise unique.
Once a tree is designated as a Heritage Tree, a Notice of Heritage Tree Designation shall be recorded against the property on which the tree is located. Heritage Trees located on public property are exempt from the recording requirement

Other Municipal Code Sections

Section 1006 Bidwell Park and Playground Commission
b. The council shall be responsible for the propagation, planting, removing, pruning, and maintenance of all trees and shrubberies on the streets and along the sidewalks of the city. The council shall adopt such ordinances as may be necessary to exercise such responsibilities and may in such ordinances delegate the responsibility to any other board, commission or department of the city as it determines.
Section 1006.1 Same- Powers and Duties
The power and duty to provide for the propagation, planting, removing, pruning and maintenance of all trees and shrubberies along the streets and sidewalks of the city and to adopt such rules and regulations as may be necessary to govern and control the planting, removal, pruning, and maintenance of such trees and shrubberies.
Chapter 14.40 Street Trees
14.40.030 Adoption of street tree plan: The commission shall adopt as a resolution a city-wide street tree plan controlling and governing the planting of trees and shrubs in public areas. Such plan shall specifically set forth the several species of trees or shrubs which may be planted or placed in the specified areas or locations in the city. Copies of such plan shall be filed in the office of the public works department and in the office of the community development department. Copies of such plan shall at all times be made available in such offices to property owners within the city. (Prior code § 23.51-l (Ord. 852 §12, Ord. 2364 §156), Ord. 2439 §92)
14.40.080 Street tree list: “Street tree list" shall mean a list of species of trees or shrubs adopted by the Bidwell Park and Playground commission pursuant to this chapter, available for planting in different areas of the city in accordance with the street tree plan. Copies of such list shall be kept on file in the office of the public works department and the office of the community development department. (Prior code § 23.49-4 (Ord. 852 §6, Ord. 2364 §160), Ord. 2439 §94)
14.40.090 Street tree plan: “Street tree plan”' shall mean a uniform city-wide plan for street tree planting of shrubs or trees, as adopted by the Bidwell Park and Playground commission, pursuant to this chapter, a copy of which shall be filed with the general services department and the office of the building and development services department. Such plan may consist of several parts adopted at different times for different sections of the city. (Prior code § 23.49-5 (Ord. 852 §7, Ord. 2364 §161))
14.40.120 Permit – Required: No trees or shrubs shall be planted in or removed from any planting area in the city unless:

A. A written permit therefor is authorized by the commission or the city council and is issued by the director; or

B. Such planting or removal is required by order of the commission or the city council.

The director shall bring all applications for permits to the attention of the commission and shall issue such written permit when and as directed by the commission or the city council.

The planting of a tree or shrub in conformity to the street tree plan as adopted and amended by the commission shall be deemed to be authorized by the commission and no further authorization for the granting of a permit shall be necessary.

(Prior code § 23.52 (Ord. 852 §13, Ord. 2364 §163))

14.40.130 Permit – Application:

Every person required to have a permit pursuant to Section 14.40.120, shall apply to the director, using the appropriate forms as prescribed by the city manager. As relates to such tree or shrub, only those defined as a property owner, a public utility, or a person acting in a governmental capacity shall apply.

(Prior code § 23.53 (Ord. 852 §14, Ord. 2268, Ord. 2364 §164))

14.40.150 Permit - Conditions upon issuance.

All regulations adopted by the commission pursuant to this chapter are conditions upon the issuance of any permit, unless specifically waived by the commission, or the council. The director may impose upon the granting of such permit such additional conditions as the director deems reasonable. Among others, the director may require, as such a condition upon the granting of a removal permit, the replanting of a tree or shrub in place of that removed. The director shall, when removal is being permitted for convenience of owner to make way for construction, require, as a condition, that the removal shall not take place until the work of construction is commenced, unless otherwise authorized by the commission or the council.

(Prior code § 23.53-2 (Ord. 852 §16, Ord. 2268, Ord. 2364 §165))

14.40.170 Removal by city - City's expense.

Whenever, pursuant to a permit granted or commission order, a tree or shrub is to be removed, such removal shall be by the city and at city expense, unless the commission shall find that such tree or shrub is not dead or dying and its continued existence does not create a dangerous or defective condition upon public property, in which case its removal shall be deemed to be for the convenience of the property owner.

(Prior code § 23.54 (Ord. 852 §18))

14.40.190 Cost of planting generally.

All planting or replanting, pursuant to this chapter, shall be done by the city or at city expense, except when replanting has been a condition of the granting of a permit. In the latter case, the city shall perform such work either at the request of the property owner or after such property owner's neglect to perform, the cost of such work to be charged to the property owner as herein provided. The terms "work" and "cost of such work" as used herein include not only labor but the supplying of the tree or shrub to be planted. This section shall not apply to planting required pursuant to the subdivision law of the city.

(Prior code § 23.54-2 (Ord. 852 §20, Ord. 2268))

14.40.210 Manner of sending notice for cost of work - Hearing.

In all cases wherein the work of removal, planting, or replanting is performed by the city and at the expense of the property owner, upon completion of such work, the finance director shall cause a notice of the cost of such work, which shall include the cost of any tree or shrub or other materials used, to be given by mailing a postcard to the property owner at such property owner's last known address, as the same appears on the last equalized assessment roll pursuant to which city taxes were last assessed, or the name and address of the person owning such property as is shown on the records in the office of the city clerk. The notice shall specify the following:

A. An itemized statement of the costs being so charged to the property owner; and

B. The day, hour and place when the commission will hear and pass upon the report of the director of the cost of such work, together with any objections or protests, if any, which may be raised by any property owner liable to be assessed for the cost of such work, and any other interested person.

14.40.270 Power of authority to act independently for removal.

The director, and the city manager shall each, independently, have the authority to remove a tree or shrub, without the authorization or direction of either the commission or the council, and regardless of the issuance or nonissuance of a permit, if any of such three persons determines that the immediate removal of such tree or shrub is necessary for the maintenance of public safety. In making this determination, such officer shall consider all other means available to maintain public safety. Such officer shall incur no civil or criminal liability as a result of any determination such officer makes hereunder regardless of the correctness thereof.

Such officer shall report to the commission upon any removal made pursuant to this section at its next regular meeting following such removal. The report may be submitted in writing without the appearance of such officer unless the commission otherwise requests.

(Prior code § 23.56 (Ord. 852 §28, Ord. 2268, Ord. 2364 §170))

14.40.290 Nuisances declared.

Any tree or shrub growing or standing in the public area fronting private property which, in the opinion of the commission, creates a dangerous or defective condition or endangers the security or usefulness of any public street, sewer or sidewalk is hereby declared to be a public nuisance.

(Prior code § 23.58 (Ord. 560 §10))

14.40.300 Branches to be trimmed.

It shall be unlawful for any person in the city to permit branches of trees or shrubs growing or being on private property to extend within ten feet from the ground over any portion of the sidewalk or street.

(Prior code § 23.59 (Ord. 224 §211))

14.40.310 Maintenance.

The director shall propagate, plant, replant, remove, prune, care for, and maintain the trees and shrubbery on the streets, along the sidewalks and in the parking areas of the city, except as in this chapter such duty is imposed on a property owner. The director shall report to the commission from time to time regarding work done pursuant to this section. Such work shall, at all times, be subject to the control and direction of the commission.

(Prior code § 23.59-1 (Ord. 852 §30, Ord. 2268, Ord. 2364 §171))

14.40.320 Unlawful acts.

No person shall damage, cut, carve upon, transplant or remove any tree or plant, or injure the bark or pick the flowers or seeds of any tree or plant; nor shall any person attach any rope, wire or other contrivance to any tree or plant; nor climb any tree; nor walk, stand or sit upon monuments, vases, fountains, railings, fences or upon any other property not designated or customarily used for such purposes. A person shall not dig in or otherwise disturb grass areas or in any other way injure or impair the natural beauty or usefulness of any area.

(Prior code §23.60 (Ord. 224 §213, Ord. 355 §213, Ord. 560 §11), Ord. 2479 §17)

14.40.350 Failure of commission to act on permit - Action by council.
Notwithstanding other provisions of this code to the contrary, when the director or some other authorized officer of the public works department, makes application under the provisions of this chapter for the removal of trees or shrubs for the purpose of making way for public works, that application shall be brought before the commission at its next regular meeting following the making of such application. The commission may either authorize and direct the granting of such permit as applied for (including the imposition of waiving of conditions as requested in the application) or the commission may make its recommendations concerning such application and cause the same to be transmitted to the city council. The city council shall consider such application and such recommendations of the commission at its next regular meeting. The city council shall thereafter take such action as it deems appropriate. If the commission shall fail within thirty-five days after its first regular meeting following the making of the application to either grant such permit or make its recommendations and transmit them to the city council, then the city council may deem such failure as a recommendation of denial and may proceed to act upon such application as it deems appropriate. No determination or order made by the commission under this section shall be appealable.
(Prior code § 23.63 (Ord. 852 §3, Ord. 2364 §173), Ord. 2439 §96)

14.70.110 General conditions of license to operate an outdoor café in the public right-of-way - Operations restrictions:
F. Lighting shall not be affixed to any vehicle, tree, or other city property.

14.90.070 Operation, license and maintenance.
I. All facilities, including, but not limited to, telecommunication towers, poles, accessory equipment, lighting, fences, walls, shields, cabinets, artificial foliage or camouflage, and the facility site shall be maintained in good condition, including ensuring the facilities are reasonably free of:
1. Subsidence, cracking, erosion, collapse, weakening, or loss of lateral support to City streets, sidewalks, walks, curbs, gutters, trees, parkways, street lights, traffic signals, improvements of any kind or nature, or utility lines and systems, underground utility line and systems (water, sewer, storm drains, gas, oil, electrical, etc.) that result from any activities performed in connection with the installation and/or maintenance of a wireless facility in the public right-of-way;

J. All trees, foliage or other landscaping elements approved as part of the facility shall be maintained in a neat, safe and good condition at all times, and the permittee, owner and operator of the facility shall be responsible for replacing any damaged, dead or decayed landscaping. No amendment to any approved landscaping plan may be made until it is submitted to and approved by the public works director.

City of Chico 2020-2021 Simplified Fee Schedule

Page 124. Fees requiring public hearings: Tree excavation and root barrier.	
First 10 root barriers	$188.00
Each additional root barriers	$61.00
Page 58. Public Work Fees:	
Planted in open landscape areas - Street Tree Only	$191.50
Planted in open landscape areas - Tree with Wrought Iron Tree Guard	$637.50
Planted in existing 4'x4' concrete cut-out: Tree with Cast Iron Grate	$871.50
Planted in existing 4'x4' concrete cut-out: Tree with Cast Iron Grate and Wrought Iron Tree Guard	$1,454.00
Planted in area requiring cutting and removal of 4'x4' concrete cut-out - Tree with Cast Iron Grate	$1,171.50
Planted in area requiring cutting and removal of 4'x4' concrete cut-out - Tree with Cast Iron Grate and Wrought Iron Tree Guard	$1,652.00
Tree Preservation Fees/Tree Removal Permit Fees:	
1 - 5 trees per parcel	$214.50
More than 5 trees per parcel	$368.00
Removal of trees subject to CEQA review per parcel	$812.50
Tree Replacement in Lieu Fee	$530.50 (Every 6” diameter)

City of Chico Memorandum (May 2019)

Subject: Revision to Tree Preservation Fees per CMC Chaps 16.66 and 16.68

Staff recommend the Tree Replacement In-Lieu Fee per CMC Chaps 16.66 and 16.68 is increased to $507/six inches of tree caliper. This rate equates to $84.75/inch of tree caliper.

Staff recommend that the Voluntary Heritage Tree Program Fee per CMC Chaps 16.66 and 16.68 is reduced to zero. There have been no residential applications submitted to this program in recent years. Staff believes the fee is a barrier to entry.

Local Road Safety Plan prepared by Headway Transportation (May 2021)

Page 58. The Caltrans led SR 32 Reconstruction project, which encompasses Nord Avenue within the City of Chico, will provide approximately $22.6 million in upgrades including sidewalks, Class II & III bike facilities, ADA improvements, removing trees in the clear-zone, and restriping the roadway.

Page 108. Potential Roadway Segment Project: Nord Avenue (W 1st Street to W Lindo)
Potential Safety Concerns observed during the virtual corridor review:
-Trees on the side of the road.

Root Pruning – Sidewalk Repair Technical

The city of Chico is concerned with the preservation and protection of its trees during construction activities. These specifications detail the procedures necessary to achieve the preservation and protection during construction activities. All tree maintenance work shall be done to the satisfaction of the Engineer and the City Certified Arborist. Contractor shall be required to use the services of the City Certified Arborist in all maters regarding the protection and pruning of trees. Pre-construction Review: At pre-construction meetings deemed necessary for each Work Order, the Engineer and City Certified Arborist will review the tree maintenance requirements with the

contractor. All pruning work shall be accomplished in accordance with the ANSI A300-2013 Part 8 Root management Standards and companion BMP 2017 root pruning standards and incorporating Western Chapter International Society of Arboriculture Pruning Standards.

Plans

Bidwell Park Master Management Plan

2.2.4 Regional Context
The BPPC is responsible for oversight review and direction of Bidwell Park operation and maintenance. The BPPC also has oversight responsibilities for the maintenance of City parks, street trees, and landscaping within public rights-of-way.
2.6.2.3 Vegetation Management
To help the Park Division reduce the amount of herbicides used in Bidwell Park, volunteers are sought to help with the manual removal of non-native invasive plants and trees. Vegetation management projects are normally confined to Lower Park; however; specialized removal of target species also occurs in Middle and Upper Park.
3.5.3.2 Biological Resources.
Conserve, protect, and optimize natural resource functions and values in the Park and maximize their integration with natural resources in surrounding areas.
I. AR-2. Mature native trees that provide shade to the stream should be protected, where feasible.
3.5.4.7 Public Safety and Emergency Services
Objective O. PS/ES-5: Continue to use appropriate and up-to-date arboricultural practices in the care of trees in Bidwell Park.
Objective I. PS/ES-11: Regular tree assessments should be conducted to identify potential public safety risks posed by unhealthy trees, dangling branches, and similar safety risks in heavily used areas of the Park.
3.6.1.3 Cedar Grove Objectives
Objective O. CG-1. Manage the World of Trees to maintain its historic character and preserve a diversity of trees while allowing for invasive plant removal. Implementation Strategy I. CG-1. The following shall be considered when implementing the Cedar Grove Area Concept Plan (Appendix G): - Continue controlling invasive plants at Cedar Grove while allowing historic trees to have a natural existence; - Remove the eucalyptus grove near the deer pen because of fire hazard;
3.6.3.3 DISC GOLF/TRAILHEAD AREA OBJECTIVES, IMPLEMENTATION STRATEGIES AND GUIDELINES
I. DG/T-1. Consistent with the Upper Bidwell Park Disc Golf Course Environmental and Design Report (Appendix H), the Environmental Impact Report (EIR) prepared for the BPMMP, and direction provided by the CAC and BPPC, the following measures shall be implemented in order to avoid or minimize detrimental effects on natural, cultural, and other environmental resources when designing, developing, and managing Disc Golf: - Damage to oaks and other native trees from hits by discs including should be minimized; - Disc golf tees and holes shall be located outside of tree canopies where feasible;
Appendix C
3.1.3.1 Oak Woodland Sustainability
The apparent lack of natural oak regeneration at Bidwell Park potentially poses a threat to the long-term viability of its oak woodlands.
3.1.4.1 Oak Woodland Sustainability
The city should inventory existing oak stands and determine which stands have inadequate regeneration and thus, need additional management actions. Stands identified as lacking sufficient regeneration to meet management goals should receive supplemental oak plantings and be prioritized for appropriate vegetation management techniques to decrease competition from nonnative grasses and forbs.
3.1.4.2 Wildland Fire
A prescribed burning program within oak woodlands, including proper controls, documentation and monitoring should be initiated. Oak stands surrounded by or interspersed with dense or decadent shrublands and dead, downed wood should be treated first to reduce the probability of catastrophic wildfire.
4.3.2 Wildlife Habitat Provision
It is advisable that populations of invasive trees and shrubs be assessed for wildlife habitat values and the presence of wildlife, within the context of the surrounding vegetation, before implementing invasive plant treatments.
4.4.4 Invasive Plant Treatment Methods
1. Prescribed Burning- Can be used in grasslands, shrublands, and woodlands. Less applicable in valley oak woodlands; although still useful if properly planned. Most effective at controlling herbaceous plants. 2. Grazing- Most useful in treating shrubby vegetation. Can also be used to treat starthistle and other thistles, blackberries, and similar vegetation. Most useful in treating small areas 3. Mowing- Most useful in treating herbaceous vegetation over smaller areas 4. Herbicides- Applicable to any vegetation type. Useful as a follow-up to other treatments. 5. Mulching- Useful as a follow up to other methods. Generally, of limited usefulness by itself. 6. Mechanical- Most useful for small infestations 7. Biological control- Useful as a temporary control or in combination with other methods. Rarely achieves complete eradication.
5.4.1.2 Fuels Management
Fuel management treatments designed specifically to protect oak woodlands should focus on removing fuels at the base of oak trees.
Fuels treatment should be designed to produce multiple benefits (e.g., reduce wildfire risk, improve plant and wildlife habitat, remove invasives, protect sensitive resources). The method select should be the most cost effective that poses the least amount of risk to public safety and park resources.
5.4.2.1 Prescribed Burning Prioritization
Acceptable fuel loads can be developed to meet a number of resource management and public safety objectives such as improved oak regeneration and wildlife habitat, protection of Park buildings and recreation areas, creation of shaded fuel breaks (i.e., areas dominated by large trees with limited understory vegetation) to slow wildfire spread, and protection of adjacent property owners. Areas of the Park not meeting fuel load guidelines can then be prioritized for treatment based on the relative threats posed to public safety and ecological function by each site.
Appendix E
Accessibility to Trails: Removal of debris and vegetation such as downed trees or branches in the trailway, or the clearing of trial encroachments from such items as brush, grasses, or rock slides.
Appendix F
Specific Elements of the Horseshoe Lake Area Concept Plan

Native tree plantings to provide shade to key use areas and visual separation between users; and overlook and seating areas around the lake.
Appendix G
Specific Elements to Cedar Grove Area Concept Plan: Planting of additional trees in/near parking area to provide shade and soften the appearance of delineated parking;
Appendix H
Disc Golf Course Design Environmental Criteria: **Blue oaks and other native oak species** (declining habitat type, sensitive habitat type under California Environmental Quality Act (CEQA), compaction and duff removal under canopy drip line and full cuts (i.e., to cambium) or breakage through bark may harm trees); • Keep structures and anticipated disturbance area out of canopy drip zone plus min. 5 foot buffer • Minimize trails under blue oak canopies; where trails intercept area under blue oak canopies, keep trail width to less than 3 feet • Provide 20 foot setback from trunks for shielding pole structures • Minimize number of trees in flight line and protect trunks where necessary • Mitigate by protecting/restoring habitat in areas with structures/activities

CAP Complete Final Draft

Measure S-2 Develop and Implement Urban Forest Management Plan
CITY COSTS: City costs will include staff time for development of the Urban Forest Master Plan ($140 thousand), tree planting ($2 million) and maintenance ($3 million) costs, currently being paid for with a grant. Capital needs for implementing this measure in the future can be addressed through existing programs and initiatives, as well as pathways identified in the Climate Action Finance Map
Action S-2-1 Develop, Adopt, and Implement Urban Forest Management Plan
Create an actionable strategic plan for the City's urban forest that will guide it to its vision of a healthy, robust and resilient urban forest over the next 40 years. The plan shall include sections on work programs, policies, ordinances, sustainable urban forest management, design, planting, staffing, stewardship, carbon offset, storm water management, creek, open space and natural resource management, public tree inventory, and community participation and education
Action S-2-2 Conduct a Canopy Cover Analysis
Conduct a tree canopy coverage analysis that includes all trees within the city limits, including public and private property trees, open space, natural resources area, creek and riparian areas, and golf courses. The resulting study should provide information on the number of trees and tree density on all identified areas and provide analysis if trees are equitably distributed throughout the city and present a clear picture on where city should strategically invest resources.
Action S-2-3 Conduct citywide tree planting analysis
Conduct a tree planting analysis to gain a better understanding of the urban forest's overall condition. The resulting information should be used to develop management recommendations associated with tree removal, tree planting, trimming cycle adjustments and related maintenance activities. Additionally, the results of this analysis should be used to develop a list of recommended tree species that will be suitable for the city's current environmental conditions as well as anticipated conditions caused by climate change.

Climate Action Plan Measures Update- Appendix B CAP Measures Technical Evidence (September 2020)

Page 49. **Sequestration**: The best technology cities have for achieving higher rates of carbon sequestration is through increasing the urban tree canopy by planting more trees and greenscaping. The CAP measure supporting this goal will do just that – increase carbon sequestration through greenscaping programs. The primary action under this measure is implementing Chico's Urban Forest Revitalization Program, which establishes tree planting goals for the future. The details of each action supporting the carbon sequestration measure, and evidence of their GHG reduction potential, are included below.
Measure S-1: Increase carbon sequestration by increasing urban canopy cover at least 10% by 2030 through new greenscaping programs 1. **Implement Chico's Urban Forest Revitalization Program:** Implement the Urban Forest Revitalization Program to plant 700 trees by March 2022 (adopted) and 4,500 trees by 2030 (new goal). Focus on areas of the City with low tree canopy cover based on canopy map and optimize carbon sequestration through management of the existing urban forest. 2. **Increase greenspace in Chico:** Identify and participate in partnership opportunities necessary to convert public and private spaces into greenspace and increase the City's carbon sequestering greenspace by 2030. 3. **Improve greenspace management to maximize carbon sequestration:** Improve management of public open space and park lands to maximize carbon sequestration. Through permit review, evaluate and ensure that landscaping plans utilize native species identified in the Urban Forest Management Plan where feasible. 4. **Promote local wood use:** Develop protocols to promote local wood use to keep biomass out of the landfill and to extend the carbon sequestration benefits of trees in long-term wood products 5. **Require shade trees in new major developments:** Require home construction in new developments to include shade trees for enhanced energy savings. Trees should be located on the east, west, or south face of the home to prevent interference with installed solar PV paneling. Tree species and location would be determined in coordination with the Planning Commission.

CAP Measures Tech Apx DRAFT (September 2020)

Sequestration
The best technology cities have for achieving higher rates of carbon sequestration is through increasing the urban tree canopy by planting more trees and green scaping. The CAP measure supporting this goal will do just that – increase carbon sequestration through green scaping programs. The primary action under this measure is implementing Chico's Urban Forest Revitalization Program, which establishes tree planting goals for the future.

Measure S-1: Increase carbon sequestration by increasing urban canopy cover at least 10% by 2030 through new green scaping programs
Implement the Urban Forest: Revitalization Program to plant 700 trees by March 2022 (adopted) and 4,500 trees by 2030 (new goal). Focus on areas of the City with low tree canopy cover based on canopy map and optimize carbon sequestration through management of the existing urban forest.
Increase greenspace in Chico: Identify and participate in partnership opportunities necessary to convert public and private spaces into greenspace and increase the City's carbon sequestering greenspace by 2030.
Improve greenspace management to maximize carbon sequestration: Improve management of public open space and park lands to maximize carbon sequestration. Through permit review, evaluate and ensure that landscaping plans utilize native species identified in the Urban Forest Management Plan where feasible.
Promote local wood use: Develop protocols to promote local wood use to keep biomass out of the landfill and to extend the carbon sequestration benefits of trees in long-term wood products.
Require shade trees in new major developments: Require home construction in new developments to include shade trees for enhanced energy savings. Trees should be located on the east, west, or south face of the home to prevent interference with installed solar PV paneling. Tree species and location would be determined in coordination with the Planning Commission.
In addition to the concrete tree planting goals the City has established under Action 1, Actions 2-5 will help create additional carbon sequestration potential for the City. However, emission reductions from these actions are not quantified, due to the difficulty in determining the exact impact these actions will have on GHG emissions in Chico. As the City moves forward in implementing these actions, an updated inventory will help quantify their impacts.

Chico 2030 General Plan

The Chico 2030 General Plan is a statement of community priorities to guide public decision making. It provides a comprehensive, long-range, and internally consistent policy framework for the growth and preservation of Chico. The policies of the Plan apply to all properties, both public and private, within the City limits. Although California State University (CSU) Chico, Chico Unified School District, and other state and county agencies with properties surrounded by the City are not obligated by law to comply with the Plan, their cooperation with its implementation will be important.

Chapter 2- Sustainability Policies
Goal SUS-6: Reduce the level of greenhouse gas emissions Citywide Policy SUS-6.4 (Community Trees) Continue to support the planting and maintenance of trees in the community to increase carbon sequestration.
Chapter 3- Land Use
Complete Neighborhoods- Elements of complete neighborhoods include extensive tree canopy and attractive landscaping.
GOAL LU-3 Enhance existing neighborhoods and create new neighborhoods with walkable access to recreation, places to gather, jobs, daily shopping needs, and other community services. Action LU-5.1.4 (Streetscape Enhancement) As part of future roadway improvement projects in the Corridor Opportunity Sites, incorporate streetscape enhancements such as bulb-outs, benches, wide and separated sidewalks, on street parking, public art, and street trees to improve the pedestrian environment and serve as a catalyst for revitalization.
Policy LU-6.2 (Special Planning Area Implementation) Action LU-6.2.6 (South Entler SPA Planning) Preserve and/or provide trees along the borders of the SPA to provide a buffer to adjacent agricultural uses and open space.
Chapter 4- Circulation Element
Policy CIRC-2.1 (Complete Streets) – Develop an integrated, multimodal circulation system that accommodates transit, bicycles, pedestrians, and vehicles; provides opportunities to reduce air pollution and greenhouse gas emissions; and reinforces the role of the street as a public space that unites the City.
Chapter 5- Community Design Element
Complete Streets and Scenic Roads- In 2030, the city's bicycle-friendly streets will continue to thrive, tree-lined streets and boulevards will be a defining characteristic, and streets will be safe, friendly, and multimodal with dedicated bike lanes.
Connections to Open Spaces- Urban Forest: Neighborhoods have street trees and landscaped parkways to enhance neighborhood character and identity.
Goal CD-1: Strengthen Chico's image and sense of place by reinforcing the desired form and character of the community Policy CD-1.1 (Natural Features and Cultural Resources) Action CD-1.1.1 (Highlight Features and Resources) Incorporate and highlight natural features such as scenic vistas, creeks, and trees, as well as cultural resources such as rock walls, into project design.
Chapter 10- Open Space and Environment
Vision: In 2030, the City of Chico is an active leader in protecting the environment through the preservation and enhancement of open space, natural resources, and agriculture. The City has recognized the importance of protecting the natural landscape for intensive and non-intensive recreation by making natural areas and outdoor recreation opportunities accessible to the entire community, which benefits public health and contributes to a sense of well-being. The urban forest thrives, with the preservation of heritage and street trees as well as the continued planting of new street trees. Greenways along urban creeks with multi-purpose paths have expanded the network of trails throughout Chico. The community enjoys clean water for consumption and recreation, and the air is clean and measurably healthy.
The term "Urban Forest" refers to the abundance of trees found in the City. Chico's urban forest provides an aesthetic community benefit, energy savings from its shade canopy, areas of refuge from warm summer temperatures, and increased foraging and nesting locations for flora and fauna.
Goal OS-6: Provide a healthy and robust urban forest
Policy OS-6.1 (Healthy Urban Forest) – Ensure the continued protection and management of the urban forest to reduce energy demand, increase carbon sequestration, and reduce urban heat gain.
Action OS-6.1.1 (Urban Forest Maintenance) • Maintaining existing trees through regular, scheduled service. • Planting new trees to replace those that require removal and to enhance the street tree canopy, where needed. • Requiring street and parking lot tree planting in new development • Working with commercial parking lot owners to improve the shade canopy. • Implementing the Municipal Code's tree protection regulations.

• Using volunteer groups and property owners to plant new trees, care for newly planted trees, maintain young trees, and provide information and instructions regarding such care and maintenance.
Action OS-6.1.2 (Utility Impacts) Where feasible, require new underground utilities that are in close proximity to trees to be designed and installed to minimize impacts to trees through consultation with the Urban Forester.
Appendix B- Opportunity Sites
North Esplanade Opportunity Site- This opportunity site encompasses the Esplanade north of Lindo Channel. The Esplanade south of Lindo channel is a world-class boulevard lined with mature trees and bordered by frontage streets.
Appendix C- Special Planning Areas
South Entler Special Planning Area Existing Conditions: The site is mostly undeveloped, relatively flat, and marked with mine tailings and evidence of past mining activity. Over the years, cottonwood and oak trees and brush have grown in the tailings. South Entler Conceptual Land Use Plan: Parks, conservation buffers, an interconnected pedestrian and bicycle network, tree-lined streets, and other open space elements will encourage pedestrian activity and foster a livable community.

Stormwater Resource Plan (August 2018)

Ch.1 Introduction of Watersheds & Subwatersheds
1.7.4.2 Urban Zone: The Urban Zone is in the valley on the edge of the Foothill Zone and mainly contains residential and urban developments. This zone has non-native vegetation and limited and disturbed habitats, as typical in urban areas. Vegetation types and habitat are described below: Vegetation in the Urban Zone is less diverse than the Mountain and Foothill Zones, and is mostly non-native. Trees include non-native and native trees planted in residential neighborhoods, grasslands are mostly limited to star thistle and non-native grasses, and scrubland includes non-native sycamores, oaks, walnuts, figs, and reeds.
Ch. 4 Submitted Projects
Project 25: Chico Green Streets and Low Impact Development Implementation Project City of Chico and Butte County, Big Chico, Little Chico, and Comanche Creek Watersheds. Increased filtration or treatment of runoff. Water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement. Increased urban spaces.
Project 26: Bidwell Park and Greenway Integrated Storm Water, Ground Water Recharge Projects are located in Bidwell Park and Greenways within Big Chico Creek, Little Chico Creek, and Comanche creek drainage basins. Projects target DAC neighborhoods and schools. Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces.
Project 27: Cal Park Green streets Project Lakes and open spaces, Little Chico Creek Marsh, Junior High Murphy Commons Low income housing and community garden and walking paths along Little Chico Creek Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces.
Project 29: LID Technical Design Manual and Demonstration Project Entire City of Chico and will target DAC neighborhoods (Chapman Mulberry) and commercial (Hagen Lane) and public properties. Butte County Schools Big Chico Creek, Little Chico Creek, and Comanche Creek watersheds.
Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 30: Chico State University LID Implementation and Stream Habitat Enhancement Project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 31: Five Mile, Lindo Channel, and Sycamore Flood Diversion Storm Water Treatment and Habitat Enhancement Project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 32: Chapman/Mulberry Neighborhood Green Infrastructure and Natural storm water treatment Project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 33: Mud and Rock Creed Flood Projection Project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 34: Little Chico Creek, Lindo channel, Mud/Rock Creek Arundo/Broom Removal and LID Implementation Project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 35: Flood Detention Pond Enhancement and LID Implementation Project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 36 Low Impact Development and Green Infrastructure Implementation Program for Butte County Schools Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 37: City of Chico storm water capture and reuse project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 38: Urban Landscape Water Conservation and Pesticide Reduction Project Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Project 39: NSV IRWM Projects Increased filtration or treatment of runoff, water supply reliability, decreased flood risk by reduced runoff rate or volume. Riparian enhancement, increased urban green spaces
Ch 4. Submitted Projects with Descriptions
Project 14 Teichert Ponds vegetation, trash and public access Remove major invasive plant species: parrot's feather, tree of heaven, Chinese tallow tree, pyracantha and Arundo.

Vegetative Fuels Management Plan (February 2021)

Goal 2: Restore and Maintain appropriate fire return Intervals in Chico's Parkland
Objective 2.4 After prescribed fire in the three woodland vegetation zones (Upland Mix, Blue Oak-Gray Pine), create and open stand of well-spaced single or few-stemmed trees that has reduced horizontal and vertical fuel continuity.

Chico's Urban Forest Outside of parks (street trees) are managed under a separate plan. The geographical scope of this writing is the 6,440 acres of parks and green space owned by the City of Chico.
When tree removal is necessary to achieve identified spacing standards, invasive species will be removed first, then non-native species, and only then native species, selected to retain maximum species and structural diversity using a "thinning from below" method retaining the largest stems.
Vegetation clearance around city-owned buildings in parks, greenways, or open space areas should comply with Cal Fire PRC 4291 regulations: Trees and shrubs should be pruned to a crown base height of 8 feet and maintained to effectively manage fuels and not form a means of rapidly transmitting fire from other nearby vegetation to a structure or from a structure to other nearby vegetation.
Jackpots of dead woody material with potential to cause torching into adjacent trees or damage nearby trees through radiant heat should be moved to open areas away from large trees. It is ok to leave branches and trunks over 4 inches in diameter where they lie, or spread as a chipped mulch, or removed. Full ground contact is not necessary.
Understory thinning in valley oak areas should first target the priority invasive shrub species according to the list in the Appendix, then should remove any other exotics, before thinning any native vegetation. Thinning and pruning may occur to raise canopy base heights to 8 feet. Remove low-hanging ivy, and thatch from decadent invasive blackberry vines from tree trunks and around the base for 6 feet to prevent regrowth up the trees.
Any burning in Valley oak should be done under weather prescriptions and with prep work (mowing and raking around each large tree or using wetlines to check the fire's spread) which reduces the likelihood of fire getting into the large trees. One tactic for protecting large, fire-susceptible oaks from ignition would be to begin the burning project by burning 10-20' diameter rings around each large oak under very mild burning conditions, possibly at night or early in the morning, and then returning later to run a hotter broadcast burn through the rest of the understory vegetation.
Restoring Over-dense Valley Oak Areas to Open Stands of Large Trees
There are areas of valley oak woodland which require major thinning to establish healthy and resilient future conditions. The density of trees causes drought stress, which makes the trees more flammable as well as more susceptible to damage or mortality should a fire occur. Thinning this type of stand to encourage the development of a mature, well-spaced stand of large oaks is a multi-decade project. We suggest thinning should begin with a focus on removing diseased/distressed individuals, retaining vigorous individuals to a spacing of no more than 70 trees per acre (about 30 feet apart *on average*, some closer, some farther apart). Branches should be pruned to achieve a canopy base height of 8 feet. Nonnative woody species should be removed where they compete with valley oaks for light or touch oak canopies. Alternatively, they may be girdled and left as standing snags (for wildlife habitat if >8" diameter at 12' above ground) as long as follow up treatments can be ensured to cut stump sprouts. Woody debris over 8" diameter may be left onsite at least 10 feet away from the nearest tree or removed. Large woody debris is left on site for wildlife habitat and nutrient cycling. Material under 8" may be chipped and broadcast to an average depth of 4" or less. Further restoration to natural vegetation may be done, including prescribed burns (to initially treat weedy grasses and forbs) and/or planting of native seed/plugs to fill out the palette of natural diversity suitable for valley oak woodland. These goals may be achieved through multiple entries.
General Vegetation Management Standards for Blue Oak-Gray Pine:
Dense areas of undergrowth under gray pine within 150 feet of Upper Park Road, below Bear Hole, should be high priority areas for thinning. Gray Pines are generally undesirable within the urbanized areas. Over the longer term, they should be targeted for thinning or removal when they are at all unhealthy in areas which are within 100 feet of a structure. Where removing gray pine is not practical, special attention should be given to reducing ladder fuels and undergrowth around the trees. Thinning or removal of gray pine should be done when the trees are small, as removing larger trees is expensive and more dangerous. Young blue oak seedlings should be protected from herbivory, by caging them, whenever management is done in these vegetation types. In areas within 100 feet of occupied structures, all unhealthy gray pine shall be removed. Where removal of the mature trees is not possible, targeted thinning of understory/ladder fuels is recommended. Blue oaks within defensible space should be retained whenever possible.
General Vegetation Management Standards for Upland Mix:
This vegetation type should be managed on a microclimate basis, thus allowing for expansion of the biodiversity in each microclimate. Biodiversity in this case, should not include invasive species; these should be prioritized for removal by grazing, hand, mechanical, or chemical treatments. Where appropriate species are present, canopy heights should be managed to be increased over time (e.g., raising canopies through hand treatments). This may be done through removal of invasive species, thinning, and pruning of shrub species, and then native tree species. Where they are present, populations of black oaks, valley oaks, broad leaf maples and other deciduous trees that do not present great fire hazards should be enhanced and should be prioritized over evergreen oaks.
Post-Fire Restoration in the Upland Mix - General Marking Guidelines and Best Practices
The objective is to create an open stand of well-spaced single-or few-stemmed trees that has reduced horizontal and vertical fuel continuity. Stands should retain the larger well-spaced trees (live and dead). Emphasis should be placed on the recruitment of all oak species of all sizes.

City of Chico Design Guidelines Manual

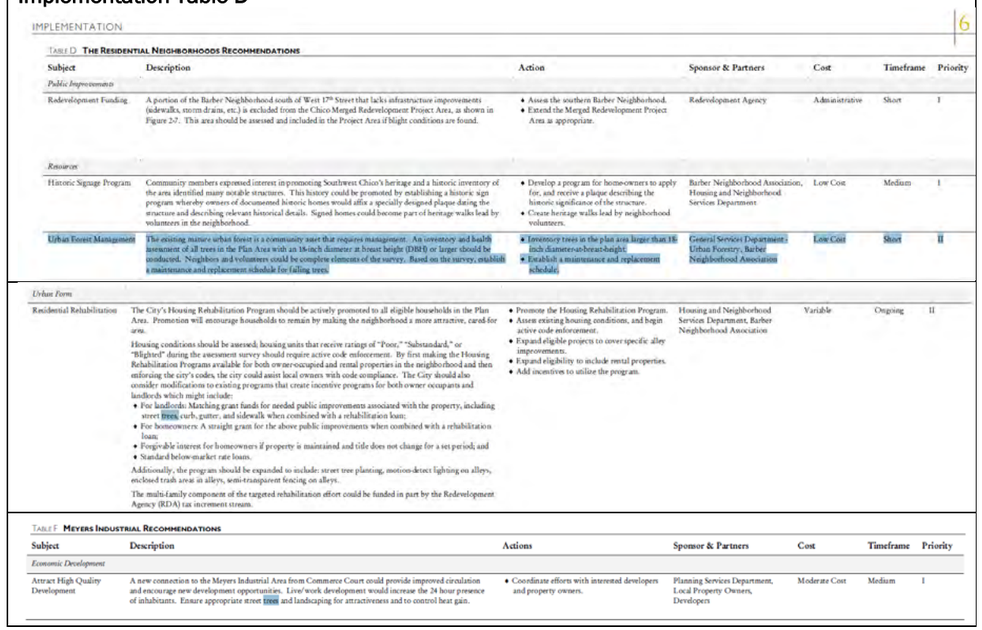
Chapter 1: Community Design
1.5.1 Exterior Lighting : **DG 1.5.13** - Integrate a finished height of parking lot light fixtures that is below the expected canopy of shade trees. Pole-mounted lights in excess of 18 feet in height is discouraged
1.7.1 Energy Conservation: **DG 1.7.13** – Consider deciduous shade trees in landscape design a south and west sides of buildings, allowing heat gain in colder seasons and providing shade during hotter seasons.
Chapter 5: Community Facility Project Types
1.1.4 Landscaping: DG 5.1.41- Incorporate existing distinctive and/or mature trees and vegetation in landscape design. DG 5.1.42- Enhance existing trees and vegetation with new landscaping, giving priority to shade trees in parking lots. DG 5.1.43- Select landscape plantings that grow well in Chico's climate without extensive irrigation DG 5.1.44- Select a landscape design to achieve an end result by either enhancing, buffering or screening
Chapter 6: Industrial Project Types
6.1.41- Landscaping, Screening and Buffering : DG 6.1.41- Incorporate existing distinctive and/or mature trees and vegetation in landscape design. DG 6.1.42- Enhance existing trees and vegetation with new landscaping, giving priority to shade trees in parking areas. DG 6.1.43- Select landscape plantings that grow well in Chico's climate without extensive irrigation

The Avenues Neighborhood Plan (2008)

J. Street Trees
Goals and Objectives -Improve general health and air quality by maintaining and replacing trees in the Avenues Neighborhood - Secure funding for an ongoing urban forestation program Recommendations -Identify funding resources and secure adequate resources to maintain and replace as needed street trees in the Avenues.
H. Proposition 12 Tree Planting Grant Program
This California Department of Urban Forestry program provides over $1 million per year in grants to cities, counties, districts and nonprofit organizations for planting, and three years of maintenance of trees in urban public settings. The maximum award is $25,000 for a "small population community" and $50,000 for "regular Proposition 12 applicants."
Proposed Design Guidelines
Design Guidelines: Accessory Dwellings – Second Units
Privacy landscaping (trees/tall shrubs) shall be planted along side and rear property lines if the second unit is taller than one story or 15 feet.

Southwest Chico Neighborhood Improvement Plan

Existing Conditions
3. Development Patterns
Park Avenue Corridor Pg12 Utilities were recently relocated underground and the sidewalk has consistent street trees along its length. Pg 15 This portion of Park Avenue has a recently improved streetscape, with median plantings, public art, street trees and a multi-use bicycle path.
Goal 1 Enhance Community Character The residential areas in Southwest Chico are characterized by a unique sense of place, where people take pride in stewardship of their neighborhood. This character stems from the historic pedestrian-scaled grid; the modest cottages, handsome bungalows and stately manors; the expressive gardens and front yards; the dense, mature urban forest; and the semi-rural quality of many of the streets. This Plan looks to maintain and extend this character. Private improvements and development in residential areas should observe design guidelines stemming from the existing context. Street improvements should be designed to improve but not replace. The existing urban forest should be well cared for to enhance what is there, and new trees as necessary.
Recommendations
4. **Manage Stormwater Runoff before it enters the Creeks** **....** Structural soils, when combined with permeable paving and/or tree wells, can increase water storage capacity while also providing sufficient area for street trees to develop a substantial root system, which in turn will better ensure long-lived and large canopied trees.
1. Focus New Development at Nodes along Upper Park Avenue Street trees should be planted where they do not already exist and existing mature trees should be preserved with street and sidewalk improvement that provide ample space for healthy trees.
5. Preserve the Urban Forest Entering the Southwest Chico residential neighborhoods, it is clear they are unique by any standard. A most striking feature is the mature urban forest that dapples streets and gardens under its dense and diverse green canopy. The trees also regulate the climate in the neighborhood and lend comfort to the pedestrian environment. The larger trees especially should be assessed as part of the City's Urban Forestry program and a prioritized replacement plan developed to address tree protection and management proactively.
2. Attract High Quality Development **...**Streets should be planted with street trees to help control heat gain.
2. Other Sub Areas As discussed in Chapter 4, the Plan proposes new streets in the Wedge Sub-Area between Park Avenue and Fair Street as well as a new connecting street into the Meyers Industrial Area. These new streets will be an important link in the pedestrian network and should be developed with generous sidewalks, landscaping and street trees.
Circulation **I. Traffic Calming in the Residential Neighborhoods** **....** Where choker islands are installed, high-branching trees and other landscaping could be planted. The design of traffic calming devices should also consider incorporating methods for capturing or diverting stormwater runoff for detention or infiltration.
Implementation Table D



IMPLEMENTATION 6

TABLE D THE RESIDENTIAL NEIGHBORHOODS RECOMMENDATIONS

Subject	Description	Action	Sponsor & Partners	Cost	Timeframe	Priority
Public Improvements						
Redevelopment Funding	A portion of the Barber Neighborhood south of West 17th Street that lacks infrastructure improvements (sidewalks, storm drains, etc.) is excluded from the Chico Merged Redevelopment Project Area, as shown in Figure 2-7. This area should be assessed and included in the Project Area if blight conditions are found.	• Assess the southern Barber Neighborhood. • Extend the Merged Redevelopment Project Area as appropriate.	Redevelopment Agency	Administrative	Short	I
Resources						
Historic Signage Program	Community members expressed interest in promoting Southwest Chico's heritage and a historic inventory of the area identified many notable structures. This history could be promoted by establishing a historic sign program whereby owners of documented historic homes would affix a specially designed plaque during the structure and describing relevant historical details. Signed homes could become part of heritage walks lead by volunteers in the neighborhood.	• Develop a program for home-owners to apply for, and receive a plaque describing the historic significance of the structure. • Create heritage walks lead by neighborhood volunteers.	Barber Neighborhood Association, Housing and Neighborhood Services Department	Low Cost	Medium	I
Urban Forest Management	The existing mature urban forest is a community asset that requires management. An inventory and health assessment of all trees in the Plan Area with an 18-inch diameter at breast height (DBH) or larger should be conducted. Neighbors and volunteers could be complete elements of the survey. Based on the survey, establish a maintenance and replacement schedule for failing trees.	• Inventory trees in the plan area larger than 18-inch diameter-at-breast-height. • Establish a maintenance and replacement schedule.	General Services Department - Urban Forestry, Barber Neighborhood Association	Low Cost	Short	II
Urban Form						
Residential Rehabilitation	The City's Housing Rehabilitation Program should be actively promoted to all eligible households in the Plan Area. Promotion will encourage households to remain by making the neighborhood a more attractive, cared-for area. Housing conditions should be assessed; housing units that receive ratings of "Poor," "Substandard," or "Blighted" during the assessment survey should require active code enforcement. By first making the Housing Rehabilitation Programs available for both owner-occupied and rental properties in the neighborhood and then enforcing the city's codes, the city could assist local owners with code compliance. The City should also consider modifications to existing programs that create incentive programs for both owner occupants and landlords which might include: • For landlords: Matching grant funds for needed public improvements associated with the property, including street trees, curb, gutter, and sidewalk when combined with a rehabilitation loan; • For homeowners: A straight grant for the above public improvements when combined with a rehabilitation loan; • Forgivable interest for homeowners if property is maintained and title does not change for a set period; and • Standard below-market rate loans. Additionally, the program should be expanded to include: street tree planting, motion-detect lighting on alleys, enclosed trash area in alleys, semi-transparent fencing on alleys. The multi-family component of the targeted rehabilitation effort could be funded in part by the Redevelopment Agency (RDA) tax increment stream.	• Promote the Housing Rehabilitation Program. • Assess existing housing conditions, and begin active code enforcement. • Expand eligible projects to cover specific alley improvements. • Expand eligibility to include rental properties. • Add incentives to utilize the program.	Housing and Neighborhood Services Department, Barber Neighborhood Association	Variable	Ongoing	II

TABLE F MEYERS INDUSTRIAL RECOMMENDATIONS

Subject	Description	Actions	Sponsor & Partners	Cost	Timeframe	Priority
Economic Development						
Attract High Quality Development	A new connection to the Meyers Industrial Area from Commerce Court could provide improved circulation and encourage new development opportunities. Live/work development would increase the 24 hour presence of inhabitants. Ensure appropriate street trees and landscaping for attractiveness and to control heat gain.	• Coordinate efforts with interested developers and property owners.	Planning Services Department, Local Property Owners, Developers	Moderate Cost	Medium	I

Reports, Contracts, Assessments

Climate Vulnerability Assessment (2018)

Page 31- Bark beetles, family Scolytidae, are common pests of conifers (e.g., pines), and some attack broadleaf trees. Bark beetles mine the inner bark (the phloem-cambial region) on twigs, branches, or trunks of trees and shrubs. Bark beetles frequently attack trees weakened by drought, disease, injuries, or other stressors. Bark beetles can contribute to the decline and eventual death of trees, although only a few aggressive species are known to be the sole cause of tree mortality. Not only does this lead to the death of trees which are a key factor in biodiversity and habitat, but once the trees are infested and/or dead they become fire hazards.

Page 33- Drought conditions are also expected to increase the frequency of tree pathogens due to indirect effects on host physiology.
Page 34- Higher temperatures can lead to an increase in the Bark Beatle population, which degrade the health of local trees, turning them into rotted, dry fodder for wildfires. Areas with drought-stressed trees, shrubs, grasses and other fire “fuels”—places such as Chico’s Bidwell Park—will be especially vulnerable to combustion.
Page 36- Urban greening and urban forestry in the City are supported by numerous organizations and agencies. Urban forestry involves the planting and maintenance of trees within urban areas to mitigate these impacts. Trees provide shade for homes, roadways, and parking lots, providing relief during periods of extreme heat. Further, ground-level ozone produced from excessive heat can be filtered by certain tree species, which improves local air quality (Nowak 2002). Trees provide shade coverage which can also reduce energy demand.
Page 37- Existing efforts to maintain and enhance the urban forest canopy may provide some increase in shading throughout the City, mitigating portions of transportation-related surfaces (e.g., asphalt) from excessive sun exposure. However, planting of shade trees alone may not be enough to fully mitigate potential damage from increased temperatures and extreme heat. The use of cool pavements, permeable pavements, and higher-albedo impervious materials on various surfaces should be investigated.

Chico Inventory Summary Report (April 2021)

The most common species is *Pistacia chinensis* (Chinese pistache) with 2,825 trees collected. Followed by *Quercus lobata* (Valley oak, 2,550), *Lagerstroemia indica* (crape myrtle, 2,275), *Acer rubrum* (red maple, 2,270), *Platanus x hispanica* (London plane, 1,302), and *Juglans hindsii* (N. CA black walnut, 1,247).
No single family, genus, or species exceeds this guideline in the Chico tree inventory although the *Acer* (maple) genus and *Pistacia chinensis* species come closest at almost 18% of the genus totals and over 8% of all species.
Largest family represented is Aceraceae with 6,139 (17.8%) which contains the genus *Acer* (maple) that accounts for almost 20% of the total genus population. The second largest family is Fagaceae at 5052 (14.7%) of the total population which includes the genus *Quercus* (oak), which accounts for 14.4% of the total genus population.
Environmental Benefits Summary: • Total of $6.6 million in annual environmental benefits. • $5.4 million in property benefits through increased property values. • Nearly 27 million gallons in reduced stormwater runoff, valued at $207,353. • 3.6 million pounds of CO_2 avoided through lowered demand for electricity. • Over 2.5 million pounds of CO_2 sequestered in woody and foliar biomass. • 25,082 pounds of pollutants removed annually, valued at $359,644. • $551,928 in energy benefits: • Over 4.6 million kWh saved through reduced electricity usage. • 6,174 Therms saved through reduced natural gas usage.

South Campus Neighborhood Project Report (April 2016)

The Resilient Cities Initiative’s partnership with the Public Works-Engineering Department at the City of Chico of 2016-2017 outlines a plan to appraise Chico’s urban forest which includes an area called the South Campus Neighborhood (SCN or Neighborhood). This report assesses the current status and condition of the trees in SCN including the frequency, size, and tree health as well as safety issues such as powerline interference and sidewalk uplift. s noted, the study area is one of the oldest neighborhoods in Chico. This is reflected in the size of trees. A majority (65%) of the trees are less than 50 centimeters DBH (20 inch diameter) reflecting the ever changing nature of the urban forest. There are a number of large trees though, with 140 trees (14%) recorded as having 75 centimeters DBH (30 inch diameter) or greater. Collectively, the trees appear to be in relatively good health throughout the study area. Over 40% of the trees are classified as ‘good’ vigor condition and 38% are classified as ‘fair’ vigor. Approximately 9% of the trees are classified as ‘poor’ or ‘dead/dying’. the information contained in this report provides valuable insights on the existing conditions of the Neighborhood’s urban forest and the information herein will be used to inform the development of a neighborhood improvement plan.

Public Work Project Contract- Tree Pruning, Removal, and Stump Grinding Services (May 2020)

All work shall be overseen by the City’s Urban Forest Manager and/or Street Tree Supervisor. The basic SOW for this project consist of tree pruning and maintenance, tree removal, and stump grinding.
All services shall be performed in accordance with current standards established by the American National Standard Institute and ISA Guidelines and BMPs.
Tree climbing spurs shall not be used except where trees are to be removed, where trees cannot otherwise be safely accessed, or in the case of emergencies.
Pruning Objectives: 1. Mitigate Risk- Prune to lower the likelihood of tree, branch and/or other tree part failure and impact to targets. Pruning shall be in accordance with ANSI Part 9 Tree Risk Assessment. Trees>24” DBH shall receive end-weight reduction on horizontal branches to remove 25% length and maintain a balanced crown, after consideration of the maximum size of allowable pruning cuts. 2. Manage Health- Prune to improve or maintain plant health or control pests. Eliminate dead, diseased or damaged growth as well as low or crossing limbs. 3. Develop or Improve Structure- Prune younger trees to improve plant architecture. Pruning shall attain optimum branch length, spacing, diameter and aspect ratios. Structural pruning shall be initiated early to enhance benefits and value and reduce long-term costs and potential for failure. Trees shall be pruned to the central leader concept.

4. Restoration Pruning- Prune to redevelop or improve structure, form, and appearance following damage from storms, vandalism, lion tailing, topping or other substandard pruning, or other causes.
5. Provide Clearance- Prune to prevent interference with infrastructure, buildings, traffic, pedestrians, lines-of-sight, roofs, gutters, chimneys, antennae's, line drops. Clearance pruning shall provide for five-years of clearance and minimum five feet clearance subject to limitations of pruning dosage and size of cuts.
6. Manage Size and Shape- Prune to reduce size and/or manage shape and maintain growth within space limitations. In achieving the objectives, the Contractor shall not remove more of the tree crown than necessary and shall consider the age and vigor of the tree. Under no circumstances shall more than 25% of the live crown be removed without approval from the city.
7. Retrenchment (Regenerative) Pruning- Retrenchment pruning mimics the natural process of rentrenchment by making prescriptive pruning cuts to remove declining branches, reduce risk of failure, stimulate new shoots on interior and lower branches and restore tree vitality and appearance.
8. Manage Wildlife- Pruning cuts for wildlife can include coronet cuts and natural fracture cuts. Contractor should be aware of Federal and State regulations and modify work procedures as appropriate to avoid disturbing, injuring or killing protected wildlife.

Tree Removals shall include the following:

1. Complete removal of trees, suckers and adjacent surface roots
2. Trees shall be removed in a professional manner. Care shall be taken to avoid damage to adjacent trees, landscaping, and hardscape improvements. Cut stumps must be either temporarily barricaded or left at a minimum height of 2 inches above grade.
3. All removals, once started, shall be continued until the entire tree is taken down to stump height. At no time will partial removals be allowed to remain in place for more than 48 hours without prior written consent from the Urban Forest Manager or designee. Stump shall be trimmed to 2" above grade.
4. If directed, stump shall be removed by grinding to at least 18" below ground level
5. Roots in the immediate area of the work site are to be removed either y grinding or digging them out.
6. All depressions in the soil caused by stump or root removal shall be filled and compressed so to leave the surface area slightly raised.

Stump Grinding shall include:

1. Removal of stumps and surface roots
2. Filling holes of routed stumps
3. Disposal of grinding debris
4. Legacy stump assignments

Removal of Brush, Debris, and Wood: It is the total responsibility of the Contractor to remove and dispose of all wood, chips, brush, and debris resulting from work on City trees and stumps in a safe and legal manner. All tree wood, trimmings, and debris shall be promptly removed from the work site and properly disposed of at the Contractor's expense.

Appendix D CAL FIRE Urban & Community Forestry Program – Environmental Checklist

Project Title: City of Chico Urban Forest Revitalization Program

Checklist Preparer: Richie Bamlet

Page 2. Description of Project: Planting 700 shade trees in city row- 600 in streetscape, 100 in public park. Planting holes dug using handtools after 8011 USA clearance. Metal or wooden stakes installed with post-hole pounder. Tree sizes, 15 and 5 gallon containers.

Page 4. EIR for All Projects: No conflict with any ordinances protecting biological resources, such as tree preservation ordinance, HCP's, or other policy.

Page 5. No mature trees coming into contact with power lines

Page 5. No public services such as tree pruning and maintenance would cause significant effect on the environment.

Page 6. No known trees to produce pollen/allergens/odors that are irritants or objectionable to large numbers of people.

Page 6. No mature trees causing undesirable shade of nearby property, including residences, offices, swimming pools, solar energy collectors, recreational facilities, etc. or subject adjoining properties to excessive amounts of litter/debris.

News Related Articles

CN & R- "Just Another Expense?" by Tom Gascoyne March 28, 2002

The city of Chico fined developer Andy Meghdadi $22,000 for prematurely cutting down a number of walnut, eucalyptus and olive trees on his Nob Hill subdivision property between Eighth Street and Bruce Road in east Chico. The council was encountering a problem it had never wrestled with before—how to penalize a developer for ignoring the conditions for a project's approval. In the Nob Hill case, the question was, should the penalty send a message to other developers, or should it have some rational connection to the birds who lost their nesting trees? Some in the audience criticized the council for having no policy in place to deal with developers who do not honor project conditions. At a subsequent special meeting by the council to discuss how to best monitor a project, staff reported it does not have the resources to continually monitor development projects to make sure they are staying within prescribed parameters as set by the city. As a result, the city would have to rely on the vigilance of neighbors keeping an eye on the work. It was the neighbors who first alerted the city to the Nob Hill violations.

CN & R- "Tree Ordinance Aired" by Tom Gascoyne September 12, 2002

The felling of more than 100 mature oak trees earlier this year on the Terra Bella subdivision by developer Andrew Meghdadi seemed to galvanize the community toward greater preservation of the city's trees. At a meeting of the council's Internal Affairs Committee (IAC) Sept. 10, Alan Gair, spokesman for the citizens' group Tree Action, said a loophole in current law allows a person to purchase land and then clear it of trees before applying for a development plan from the city. Plus, a homeowner in a new subdivision can remove trees, including those the city said the developer could not touch during construction of the development. "All private property should fall under the same degree of control or there is no control at all," Gair said. The ordinance puts trees in two categories for protection. "Landmark trees" are deemed "outstanding" examples of their species, are large or old or of an interesting form or 24 inches or greater in circumference at chest

height. “Significant” trees are 12 inches or greater in circumference at a chest-high level. Trees under such protection could not be topped, altered, damaged, removed or relocated without a permit. Nothing could be fastened or nailed to them, and they would be protected from contact with poisonous chemicals. In emergency situations, a police or fire chief or other designated person could approve an exception to the ordinance. The ordinance would set up a volunteer commission to oversee its implementation.

Photo by Lori Eckhart

REFERENCES

REFERENCES CITED

American Forests. 2021. "Tools, Research, Reports, & Guides: Tree Equity Score." Accessed January 26, 2021. https://www.americanforests.org/tools-research-reports-and-guides/tree-equity-score/.

Andrea, L. Why urbanisation and health? Acta Biomed. 2019 May 23;90(2):181-183. doi: 10.23750/abm.v90i2.8354. PMID: 31124992; PMCID: PMC6776222.

Ball, J., S. Mason, A. Kiesz, D. McCormick, and C. Brown. 2007. "Assessing the Hazard of Emerald Ash Borer and Other Exotic Stressors to Community Forests." Arboriculture & Urban Forestry 33(5): 350–359

Barker (1975) Journal of Arboriculture p212-220 "Ordinance Control of Trees"

BCCER (Big Chico Creek Ecological Reserve). 2021. History of BCCER. https://www.csuchico.edu/bccer/natural-resources/history.shtml

California Office of Environmental Health and Hazard Assessment. CalEnviroScreen 4.0: 2021 Assessment. https://oehha.ca.gov/calenviroscreen. Accessed January 16, 2022.

California Office of Environmental Health and Hazard Assessment. CalEnviroScreen 4.0: 2018 Assessment. https://oehha.ca.gov/calenviroscreen. Accessed January 16, 2022.

City of Chico. 2009. Resolutions of Intent to Dissolve Chico Maintenance Districts 7 , 8, and 9. City Council Agenda Report. https://chico-ca.granicus.com/MetaViewer.php?view_id=2&clip_id=73&meta_id=11595

City of Chico. 2010. General Plan Update. Draft Environmental Impact Report. https://chico.ca.us/sites/main/files/file-attachments/4.10biologicalresources.pdf?1577755637

City of Chico. 2022. "Active Development Map." March 1, 2022. https://chico.ca.us/sites/main/files/file-attachments/development_20190820_map_0.pdf?1657216079.

CUFR (Center for Urban Forestry Research). 2005. The Large Tree Argument: The Case for Large-Stature Trees vs. Small-Stature Trees. https://www.fs.fed.us/psw/topics/urban_forestry/products/cufr_511_large_tree_argument.pdf.

City of Chico. 2021. City of Chico Tree Inventory. Conducted by Davey Resource Group.

EPA (U.S. Environmental Protection Agency). 2008. EPA's Report on the Environment. https://cfpub.epa.gov/roe/documents/eparoe_final_2008.pdf.

EPA. 2020. "Heat Island Effect." Last updated December 9, 2020. Accessed January 27, 2021. https://www.epa.gov/heatislands.

EPA. 2021. "Using Trees and Vegetation to Reduce Heat Islands." Last updated December 16, 2019. Accessed January 26, 2021. https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat.

Gilman, E., Kempf, B., Matheny, N., Clark, J. 2002. Structural Pruning: Part I. Conference Precedings for the ISA International Conference. https://www.isa-arbor.com/events/conference/proceedings/2013/GILMAN_Structural%20Pruning.pdf.

Hauer, R. and W. Peterson. 2016a. Municipal Tree Care and Management in the United States: A 2014 Urban & Community Forestry Census of Tree Activities. Special Publication 16-1, College of Natural Resources, University of Wisconsin – Stevens Point. Accessed March 3, 2021. https://www.uwsp.edu/cnr/Documents/MTCUS%20-%20Forestry/Municipal%202014%20Final%20Report.pdf.

Hauer, R. and W. Peterson. 2016b. Municipal Tree Care and Management in the United States: A 2014 Urban & Community Forestry Census of Tree Activities. Summary. Special Publication 16-1, College of Natural Resources, University of Wisconsin – Stevens Point. Accessed March 3, 2021. https://www.uwsp.edu/cnr/Documents/MTCUS%20-%20Forestry/Municipal%202014%20Final%20Report.pdf

Hauer et al. 2018 "The Cost of Not Maintaining the Urban Forest." International Society of Arboriculture.

Hoehne C., Chester M., Sailor D., King D. Urban heat implications from parking, roads, and cars: a case study of metro Phoenix. Sustain. Resil. Infrastruct. 2020 doi: 10.1080/23789689.2020.1773013.

Lambert, L. 2021. More Americans Move to Cities in Past Decade-Census. Reuters Press. https://www.reuters.com/article/usa-cities-population/more-americans-move-to-cities-in-past-decade-census-idUSL2E8EQ5AJ20120326.

Leahy, I. 2017. "Why We No Longer Recommend 40% Canopy Cover." Loose Leaf (Blog), American Forests, Accessed May 14, 2021.https://www.americanforests.org/article/why-we-no-longer-recommend-a-40-percent-urban-tree-canopy-goal/.

Leahy, L., Scheffers , B., Williams, S., and Andersen, A., 2021. Arboreality drives heat tolerance while elevation drives cold tolerance in tropical rainforest ants. Ecology Vol 103:1.

Locke, D.H., B. Hall, J.M. Grove, S.T.A. Pickett, L.A. Ogden, C. Aoki, C.G. Boone, and J.P.M. O'Neil-Dunne. 2021. "Residential housing segregation and urban tree canopy in 37 US Cities." npj Urban Sustainability 1, 15. https://doi.org/10.1038/s42949-021-00022-0.

Loughner, C., D.J. Allen, D.L. Zhang, K.E. Pickering, R.R. Dickerson, and L. Landry. 2012. "Roles of Urban Tree Canopy and Buildings in Heat Island Effects: Parameterization and Preliminary Results." Journal of Applied Meteorology and Climatology 51(10): 1775–1793. https://doi.org/10.1175/JAMC-D-11-0228.1.

Mechoopda Indian Tribe of Chico. 2022. Culture. https://www.mechoopda-nsn.gov/culture.

McPherson, E.G., N. van Doorn, and J. de Goede. 2016. "Structure, Function and Value of Street Trees in California, USA." Urban Forestry & Urban Greening 17: 104–115.

McPherson, G., van Doorn, N., Teach, E. 2017. Evaluation of six drought tolerant trees 17 years after planting in Northern California. Western Arborist 32-37. https://www.fs.usda.gov/psw/publications/mcpherson/psw_2017_mcpherson001.pdf.

Miller, R.W, R. Hauer, and L. Werner. 2015. Urban Forestry Planning and Managing Urban Greenspaces Third Edition. Waveland Press. ISBN 10: 1-4786-0637-1.

Miller, R.H., and R.W. Miller. 1991. "Planting Survival of Selected Tree Taxa." Journal of Arboriculture 17(7): 185–191.

Miller, R.W. and W.A. Sylvester. 1981. "An Economic Evaluation of the Pruning Cycle." Journal of Arboriculture 7(4): 109-112.

Morgenroth, J., D.J. Nowak, and A.K. Koeser. 2020. "DBH Distributions in America's Urban Forests—An Overview of Structural Diversity." Forests 11(2): 135. doi:10.3390/f11020135.

OEHHA. https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

Richards, N.A. 1983. "Diversity and Stability in a Street Tree Population." Urban Ecology 7(2): 159–171.

Richards, N.A. 1993. "Reasonable Guidelines for Street Tree Diversity." Journal of Arboriculture 19(6): 344–350.

Ritter, 2020. CalPoly San Luis Obispo. LA Tree Summit 2020

SacTree (Sacramento Tree Foundation). 2022. Urban Wood Rescue. [Website.] https://www.urbanwoodrescue.com/.

Sutherland, A. 2014. "Invasive Pests of Concern for California's Urban Agriculture Systems," Pests in the Landscape (Blog), University of California Agriculture and Natural Resources, https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=15606. Accessed May 20, 2021.

Trust for Public Land. 2022. Urban Heat Island Severity of US Cities. Web Mapping Application. https://www.arcgis.com/home/item.html?id=1b6cad6dd5854d2aa3d215a39a4d372d.

USFS (U.S. Forest Service). 2020. i-Tree Eco. [Software.]

White, G.G. 2015. The Loveliest of Places: A Study of the Pre-Mansion Historical Resources of Bidwell Mansion State Park, Northern Buttes District. California Department of Parks and Recreation. (PDF) A Study of the Pre-Mansion Historical Resources of Bidwell Mansion State Historic Park, Northern Buttes Distict California Department of Parks and Recreation (Final Draft) | Gregory G. White - Academia.edu

Wolf, K.L. S.T. Lam, J.K. McKeen, G.R.A. Richardson, M. van den Bosch, and A.C. Bardekjian. 2020. Urban Trees and Human Health: A Scoping Review. International Journal of Environmental Research and Public Health 17(12): 4371. https://doi.org/10.3390/ijerph17124371.

World Population Review. 2022. "Temecula, California Population 2022." https://worldpopulationreview.com/us-cities/temecula-ca-population.

Ziter, C.D., E.J. Pedersen, C.J. Kucharik, and M.G. Turner. 2019. "Scale-dependent interactions between tree canopy cover and impervious surfaces reduce daytime urban heat during summer." Proceedings of the National Academy of Sciences Apr 2019, 116 (15) 7575-7580; https://www.pnas.org/content/116/15/7575.

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