



Memorandum

TO: HONORABLE MAYOR
AND CITY COUNCIL

FROM: Kerrie Romanow

SUBJECT: SEE BELOW

DATE: April 10, 2023

Approved

Date

4/17/2023

**SUBJECT: CLIMATE SMART SAN JOSE NATURAL AND WORKING LANDS
ELEMENT**

RECOMMENDATION

Accept the Natural and Working Lands Element and direct staff to incorporate into the Climate Smart San José plan.

SUMMARY AND OUTCOME

The Climate Smart San José (Climate Smart) plan identifies Natural and Working Lands (NWL) as a topic for future consideration that could be incorporated into updates of the Climate Smart plan. NWL include forests, rangelands, wetlands, farms, and urban green spaces. In the Envision San José 2040 General Plan (General Plan), NWL is defined as lands with Agriculture, Open Hillside, or Open Space, Parklands, and Habitat land use designations. Both the preservation and restoration of NWL can reduce greenhouse gas (GHG) emissions by helping to reduce transportation-related GHG emissions associated with urban sprawl and by directly removing carbon dioxide from the atmosphere (known as carbon sequestration). The preservation and restoration of NWL can also provide many co-benefits, such as flood control, improved recreational opportunities, and support for local agricultural businesses. However, as most NWL in San José are not owned or controlled by the City of San José (City), realizing the potential benefits of NWL for climate action in San José requires the involvement and support of many stakeholders, including landowners, other local agencies, and community-based organizations.

After several years of community and stakeholder engagement and technical study in coordination with the Santa Clara Valley Open Space Authority (Open Space Authority), Environmental Services Department staff developed a new NWL Element for incorporation into the Climate Smart plan. The NWL Element includes goals, strategies, milestones, and supportive City actions for preserving and managing NWL to increase carbon sequestration on these lands, without restricting the infill development required by the General Plan to provide sufficient housing and jobs in San José and without, therefore changing the foundational components of Climate Smart. Climate Smart data and modeling is built upon the assumption the General Plan

is implemented and serves as a touchstone for all climate actions building to carbon neutrality. Given that the General Plan and Climate Smart are inextricably intertwined, if changes are made to the General Plan key development strategy then Climate Smart modeling will need to be revamped and strategies reimaged to meet carbon neutrality goals.

With the achievement of the goals in the NWL Element, NWL in San José could sequester an additional 62,400 metric tons of carbon dioxide per year by 2030, which is approximately one percent of communitywide GHG emissions in 2019, the year of the latest communitywide GHG inventory, and an additional five million metric tons of carbon dioxide in total by 2050, which is approximately three percent of the total GHG emissions reductions called for in the Climate Smart plan. These goals can be achieved via the following four key strategies, which would typically be led by local stakeholders working with City guidance and support: (1) preserve existing NWL and designate some lands not suitable for development as new NWL; (2) expand the use of regenerative agriculture techniques on agricultural lands; (3) restore and enhance oak woodlands, riparian corridors, and other native ecosystems in NWL; and (4) increase access to urban green space and trees. City Council approval of the proposed NWL Element would allow staff to add these strategies and metrics to the Climate Smart plan during the upcoming plan update and, while not making any changes to the City's General Plan, would formalize the City's support for the NWL measures identified in the proposed NWL Element. The proposed Climate Smart NWL Element would be the first NWL GHG reduction plan in California adopted at the local level.

BACKGROUND

The most recent and comprehensive climate science analysis from the Intergovernmental Panel on Climate Change¹ continues to conclude that the global community must do more and faster to reduce GHG emissions or risk missing the window to prevent global temperature increases beyond thresholds that could result in significant and irreversible negative impacts. The impacts of climate change already directly affect the quality of life of all residents in San José, and disadvantaged residents bear a disproportionate burden.

In February 2018, City Council approved the Climate Smart plan, which includes milestones to significantly reduce GHG emissions by 2050 in alignment with the 2016 Paris Climate Agreement goals to prevent global temperatures from rising by more than two degrees Celsius (or 3.6 degrees Fahrenheit). Climate Smart focuses on three targeted climate action areas - mobility, energy, and water – and the associated quality of life co-benefits. In 2019, the City declared a “climate emergency.” In November 2021, City Council adopted a resolution to work towards communitywide carbon neutrality by 2030 and in June 2022 approved the Pathway to Carbon Neutrality by 2030 to further focus staff's efforts and accelerate work towards this new goal.

¹ <https://www.ipcc.ch/report/ar6/syr/>

One of the topics identified by the Climate Smart plan for further study was to assess how the protection and enhancement of San José’s Designated NWL – defined as the Agriculture, Open Hillside, and Open Space, Parklands, and Habitat land use designations in the General Plan - can help the City meet its GHG reduction targets while allowing for the continued development of new housing in infill locations and also providing a suite of environmental and community benefits. The City and the Open Space Authority partnered on this work to identify mutually agreeable NWL strategies and metrics for incorporation into the Climate Smart plan. The City created a Project Management Team, comprised of staff from City departments and the Open Space Authority, and a Technical Advisory Committee, comprised of subject matter experts from universities, nonprofit organizations, and regional and state agencies, to provide input on the NWL Element and align it with City, regional, and statewide goals and initiatives. After releasing a technical report in September 2021, staff vetted a draft NWL Element with stakeholders, finalized the proposed NWL Element (see **Attachment** – Natural and Working Lands Element), and shared it with stakeholders and on the City website in November 2022.

This work aligns with efforts at the state level to address NWL in the context of climate change. In 2020, Governor Newsom issued a sweeping executive order establishing a new “30 by 30” goal. This executive order directs state agencies to protect 30 percent of California’s NWL and waters by 2030 for biodiversity, public access, and climate resilience. This bold target is complemented by the State’s “Natural and Working Lands Climate Smart Strategy” that focuses on GHG reduction via NWL. Additionally, as part of California’s Climate Change Scoping Plan 2022 update, the California Air Resource Board included a new modeling process which estimated the potential impact of multiple scenarios containing different suites of NWL-focused actions. Finally, California Assembly Bill 1757 (C. Garcia and R. Rivas), signed into law in September 2022, will make California the first state in the nation to set quantitative goals for natural carbon sequestration. The proposed Climate Smart NWL Element would be the first NWL GHG reduction plan in California adopted at the local level.

ANALYSIS

NWL Element Development Process

The City, in coordination with the Open Space Authority, developed the NWL Element in two stages: first, a technical analysis leading to a Technical Report; second, community and stakeholder engagement leading to the final, proposed NWL Element. These stages, informed by a substantial amount of technical, stakeholder, and community input, are detailed further below.

In the first stage of work, from 2019 to 2021, the City and Open Space Authority completed a technical analysis with input from a Project Management Team and a Technical Advisory Committee. The Project Management Team was composed of 20 staff from the project consultant team, Open Space Authority, and the City’s Office of Economic Development and Cultural Affairs, the departments of Environmental Services, Parks, Recreation, and

Neighborhood Services, Planning, Building, and Code Enforcement, and Transportation. The Technical Advisory Committee was composed of 30 subject matter experts from external organizations including research faculty from Santa Clara University, data scientists from the Nature Conservancy and the California Department of Conservation, and digital mapping and modeling specialists. The Technical Advisory Committee included representatives from the University of California Cooperative Extension and the County of Santa Clara Department of Planning and Development, both of which work closely with landowners in the City and surrounding region. The analysis included:

- Identification and mapping of NWL in the City and surrounding region;
- Identification of land use and land management strategies that could best support carbon sequestration on local NWL;
- Comparison of seven land use policy scenarios in terms of total communitywide GHG emissions, carbon sequestration potential, City revenue, and other measures of community and ecological health; and,
- Calculation of the carbon sequestration potential of each land management strategy.

The technical analysis was summarized in a Technical Report, which is available on the City's NWL website. It found that the land use and land management strategies studied can reduce communitywide GHG emissions, sequester carbon, and provide co-benefits such as reduced air pollution, groundwater recharge, and reduced risk of fire damage.

In the second stage of work, from 2021 to 2022, using the information from the Technical Report as a foundation, the Project Management Team created a draft NWL Element with input from the Technical Advisory Committee, community stakeholders, and public meetings. Staff shared the draft NWL Element with stakeholders in two rounds of online public meetings - one in January 2022 and one in March 2022. Invitations were sent directly to representatives of local and regional agriculture-related organizations, land managers, community-based organizations, tribal groups, and environmental and conservation groups. Invitations to the March meetings were also sent to representatives of neighborhood associations, district leadership groups, business associations, and real estate development companies. Agriculture and land management groups invited included the University of California Cooperative Extension, the County of Santa Clara Division of Agriculture, the Guadalupe-Coyote Resource Conservation District, and the Loma Prieta Resource Conservation District, all of which work closely with landowners in the City's sphere of influence. In addition, an invitation to the March public meeting was sent to list of agricultural landowners in Santa Clara County by the local University of California Cooperative Extension, at the recommendation of County of Santa Clara staff that the University of California Cooperative Extension has the closest relationship with the agricultural community surrounding San José. Information for joining all of these meetings was also shared publicly on the City website and in social media posts by the Environmental Services Department.

Structure and Impact of the Proposed NWL Element

The proposed NWL Element includes goals, strategies, milestones, and supportive City actions for preserving NWL and increasing carbon sequestration on these lands while aligning with the General Plan. It focuses on four key indicators, described below and shown in Image 1:

Overview of NWL Indicators and Associated Metrics, Equity Considerations, and Progress Milestones:

1. NWL Preservation and Expansion – preserving NWL currently existing in San José and designating additional lands that are not suitable for development as NWL;
2. Regenerative Agriculture – using alternative land management practices, such as mulching and applying compost, that have proven to reduce carbon emissions, increase carbon sequestration potential, and support other environmental benefits;
3. NWL Restoration and Enhancement – restoring native ecosystems including grasslands, oak woodlands, wetlands, and waterways; and
4. Urban Greening – increasing access to urban green space (i.e., parkland) and supporting the City’s existing efforts to increase the number of trees in San José.

Image 1. Overview of NWL Indicators and Associated Metrics, Equity Considerations, and Progress Milestones

INDICATORS	NWL Preservation and Expansion*	Regenerative Agriculture	NWL Restoration & Enhancement	Urban Greening
METRICS	Acres of land with a NWL General Plan Land Use Designation	Acres of land with regenerative agriculture practices applied	Acres of NWLs with restoration or enhancement practices applied	Neighborhood / community serving parkland per 1,000 people
EQUITY CONSIDERATIONS	Prioritize lands near historically marginalized communities, after these are defined. Prioritize lands with Indigenous cultural significance.	Provide grant funding for farmers of color, especially those who provide fresh produce to local markets.	Prioritize lands near historically marginalized communities, after these are defined. Prioritize lands with high Urban Heat Island Index.	Prioritize lands near historically marginalized communities, after these are defined. Prioritize lands with high Urban Heat Island Index.
PROGRESS MILESTONES	Total acres of land designated as “Open Hillside”, “Agriculture”, or “Open Space, Parklands and Habitat”	New acres of City-designated NWLs with carbon farming / regenerative practices continuously applied.	New acres of City-designated NWLs with restoration or enhancement practices applied.	Total acres of neighborhood / community serving parkland within San José city limits.
TODAY	94,027	-	-	2,938
2030	94,200	3,700	4,500	3,700
2040	94,400	7,500	9,100	4,500
2050	94,600	11,200	13,600	5,200

*On vacant, non-employment lands not suitable for development

In the most recent 2019 communitywide GHG inventory, existing forests and trees in San José were found to sequester about 65,000 metric tons of carbon dioxide per year – just over one percent of total communitywide GHG emissions. The analysis in the proposed NWL Element shows that the NWL strategies identified could sequester an additional 62,400 metric tons of carbon dioxide per year by 2030 (approximately one percent of communitywide GHG emissions in 2019), and an additional five million metric tons of carbon dioxide in total by 2050 (approximately three percent of the total GHG emissions reductions called for in the Climate Smart plan). These strategies can contribute to achieving the City’s goal of carbon neutrality by 2030 while also providing valuable co-benefits such as fire and flood mitigation, habitat protection, and groundwater recharge.

In alignment with the Climate Smart plan, the proposed NWL Element is designed to complement and build upon already-existing City plans: the General Plan, the Community Forest Management Plan, the Green Stormwater Infrastructure Plan, and the ActivateSJ Strategic Plan. Together, these plans present a path towards a thriving future San José with walkable and transit-rich climate-smart communities providing residents with comfortable homes, local jobs, access to nature, and protection from environmental hazards such as flooding and heat.

Racial Equity Impact Analysis

The proposed NWL Element includes a section focused on racial equity, including five specific equity goals, pairs equity considerations with each NWL indicator, and identifies City supporting actions that are aligned with the equity goals. The NWL Element recognizes that a legacy of discrimination and systemic injustices have resulted in a lack of access to NWL for some Californians, especially California Native American tribes and communities of color. This lack of access has caused inequities, including an increased exposure to environmental pollution and the impacts of climate change, limited access to nature, reduced opportunities to farm and manage land, and loss of sacred lands and the ability to steward them. It highlights that NWL action, when implemented thoughtfully, has the potential to expand access to opportunity, produce better public health outcomes, and reverse historic patterns of disinvestment and exclusionary practices like redlining. It also recognizes that numerous efforts are already underway in San José to bring the benefits of NWL to communities that have long lacked these investments and resources. The equity components of the NWL Element were developed in collaboration with local community-based organizations.

Role of the City and Next Steps

The proposed NWL Element, similar to the Climate Smart plan, provides a framework for collaborative action with the wider community in which the City plays a central role as convener and supporter. As with climate action more broadly, supporting carbon sequestration on NWL is not something the City can achieve alone and will require the involvement of many stakeholders and supporters. Collaborative action to preserve and restore NWL in San José is already in motion, as evidenced both by the proposed NWL Element itself as well as the preservation of much of Coyote Valley’s existing NWL. Both of these important milestones are the result of years of coordinated effort by both City staff and external stakeholders.

If approved by City Council, the goals, strategies, milestones, and supportive City actions in the proposed NWL Element will be incorporated into the Climate Smart plan during the upcoming plan update and, as with the other Climate Smart plan goals, the City would support the advancement of goals associated with the NWL Element. Adopting this proposed NWL Element further expands San José's climate leadership as the first city in California with an adopted NWL strategy.

Climate Smart San José Analysis

The proposed NWL Element supports the goals of Climate Smart San José. Its strategies to protect and restore NWL are expected to:

- Reduce net GHG emissions by increasing carbon sequestration;
- Increase the density of new development; and
- Reduce Vehicle Miles Traveled.

In addition, it aligns with Climate Smart's inclusive approach by setting equity goals for NWLs.

EVALUATION AND FOLLOW-UP

Staff will provide progress updates to the Transportation and Environment Committee and City Council as part of the semi-annual Climate Smart San José updates.

COST SUMMARY/IMPLICATIONS

Approval of the NWL Element will not result in any immediate City funding needs. As indicated in the NWL Element, it is aligned with the General Plan and staff will typically play a supportive role to further NWL Element goals. Staff can seek grants or present budget proposals, subject to the appropriation of funds, as needed for any future NWL initiatives aligned with City priorities.

COORDINATION

This memorandum has been coordinated with the City Attorney's Office, the City Manager's Budget Office, City Manager's Office of Economic Development and Cultural Affairs, and the departments of Parks, Recreation and Neighborhood Services; Planning, Building, and Code Enforcement; and Transportation.

PUBLIC OUTREACH

This memorandum will be posted on the City's Council Agenda website for the May 2, 2023 City Council meeting.

Representatives of local, regional, and state nonprofit organizations and government agencies contributed input as part of the Technical Advisory Committee. A full list of represented organizations is provided on page three of the proposed NWL Element (Attachment). Staff shared the draft NWL Element with stakeholders in two rounds of online public meetings - one in January 2022 and one in March 2022. Invitations were sent directly to representatives of local and regional agriculture-related organizations, land managers, community-based organizations, tribal groups, and environmental and conservation groups. Invitations to the March meeting were also sent to representatives of neighborhood associations, district leadership groups, business associations, and real estate development companies, and to an email list of agricultural landowners in Santa Clara County by the local University of California Cooperative Extension, at the recommendation of County of Santa Clara staff that the University of California Cooperative Extension has the closest relationship with the agricultural community surrounding San José. Information for joining all of these meetings was also shared publicly on the City website and in social media posts by the Environmental Services Department.

COMMISSION RECOMMENDATION AND INPUT

No commission recommendation or input is associated with this action.

CEQA

Exempt, File No. PP17-001, Statutory Exemption for feasibility and planning studies with no commitment to future actions. This Natural Working Lands Element defines the areas already designated in the Envision San José 2040 General Plan as Open Space, Parklands, and Habitat, Agriculture, and Open Hillside and identifies strategies to meet the City of San José's Climate Smart Goals, but there is no commitment to future actions or approvals of projects.

PUBLIC SUBSIDY REPORTING

This item does not include a public subsidy as defined in section 53083 or 53083.1 of the California Government Code or the City's Open Government Resolution.

/s/

KERRIE ROMANOW

Director, Environmental Services

For questions, please contact Julie Benabente, Deputy Director, Climate Smart San José, at Julie.Benabente@sanjoseca.gov or (408) 975-2537.

Attachment - Natural and Working Lands Element

NATURAL AND WORKING LANDS ELEMENT

Climate Smart
San José



**LIVING
BETTER
TODAY FOR
TOMORROW**

Acknowledgements

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Project Leads

City of San José, Environmental Services Department

Julie Benabente
Deputy Director

Carol Boland
Supervising Environmental Services Specialist

Ken Davies
Deputy Director (ret)

Santa Clara Valley Open Space Authority

Matt Freeman
Assistant General Manager

Jake Smith
Conservation GIS Coordinator

Technical Contributors

Bay Area Open Space Council

California Air Resources Board

California Department of Conservation

Carbon Cycle Institute

Conservation Lands Network

California Strategic Growth Council

Greenbelt Alliance

Greenwaste

Governor's Office of Planning and Research

Joint Venture Silicon Valley

Midpeninsula Regional Open Space District

The Nature Conservancy

Peninsula Open Space Trust

San Francisco Estuary Institute

Santa Clara County, Office of Sustainability and Office of Planning

Santa Clara University, Department of Environmental Studies and Science

Santa Clara Valley Habitat Agency

Stanford University

University of California, Cooperative Extension

UC Berkeley Center for Law, Energy and Environment

UC Davis Information Center for the Environment

Valley Water

City Staff Contributors

Michael Brilliot, PBCE
Niccole Burnham - PRNS
Nora Cibrian, ESD
Nicholas Frey, DOT
Russell Hansen, DOT
Kevin Ice, OED
Yael Kisel, ESD
Agustin Cuello Leon, DOT
Emily Lipoma, OED
Rajani Nair, ESD
Jason Nettleton, ESD
Tiffany Ngo, ESD
Edward Schreiner, PBCE
Avi Yotam, PRNS

Consultant Team

Cascadia Partners

Alex Steinberger
Managing Partner

Sachi Arakawa
Senior Associate

Julia Michel
Senior Associate

Ayano Healy
Senior Associate

Lydia Ness
Associate

KEY

DOT: Department of Transportation

ESD: Environmental Services Department

OED: Office of Economic Development

PBCE: Planning, Building and Code Enforcement



Image: Coyote Valley (Credit: Santa Clara Valley Open Space Authority)

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00 Executive Summary

Healthy Landscapes to Combat Climate Change

Natural and Working Lands provide social, economic, and environmental benefits.

San José's Natural and Working Lands (NWLs) are linked directly to the health of our climate and communities. These landscapes are scenic places for relaxation and recreation, and essential to the health of wildlife habitats and ecosystems. In addition, these lands play a critical role in capturing and storing (also described as 'sequestering') carbon dioxide (CO₂), one of the most impactful greenhouse gases (GHG) that contribute to climate change and climate hazards affecting San José.

Understanding Our Challenge

Within the City of San José's (City) planning boundary, often referred to as its sphere of influence (SOI), there are a wide variety of NWLs, including forests, rangelands, wetlands, farms and urban green spaces. Despite being home to more than one million inhabitants, over 55% of the City's SOI is comprised of NWLs, which equates to about 99,000 acres. These lands exist not only in the places you would expect like San José's well-loved

hillsides and productive farmland, but also throughout the urban environment in the form of public parks, trails and waterways.

The findings in this document show that San José's NWLs have the potential to make an important contribution to the City's GHG reduction plan and San José's pledge to carbon neutrality by 2030 as well as the state of California's pledge to conserve 30 percent of the state's land and waters by 2030, while providing a host of additional benefits to San



Coyote Valley (Credit: Santa Clara Valley Open Space Authority)

José's people, economy, and habitats.

The ability for NWLs to sequester carbon and provide other benefits into the future will depend on the choices made today. Policy decisions that support the protection, expansion, and restoration of NWLs are essential to unlocking all of the substantial benefits that NWLs have to offer.

Our Natural and Working Lands

Climate Smart San José (Climate Smart), the City's climate action plan, defines NWLs as areas designated in the Envision San José 2040 General Plan (General Plan) as Open Space, Parklands, and Habitat, Agriculture, and Open Hillside, referred to here as 'City-designated NWLs'. The State uses a more expansive definition of NWLs developed by the California Air Resources Board (CARB), which includes forests, woodlands, grasslands, shrublands, wetlands, river and stream-adjacent (riparian) areas, rangelands, farmlands, coastal areas, and urban greenspaces.

City-designated NWLs encompass a mix of land types identified in the State's NWL definition. For example, the City-designated definition of Agriculture lands includes farmlands and rangelands. This Element defines San José's NWLs based on General Plan designations rather than using the broader state definition.

NWL Benefits

Carbon sequestration is the long-term storage, removal, or capture of CO₂ from the



The NWL Element uses the San José General Plan definitions of NWLs to ensure that recommendations found in this Element can be integrated into the General Plan during future updates.

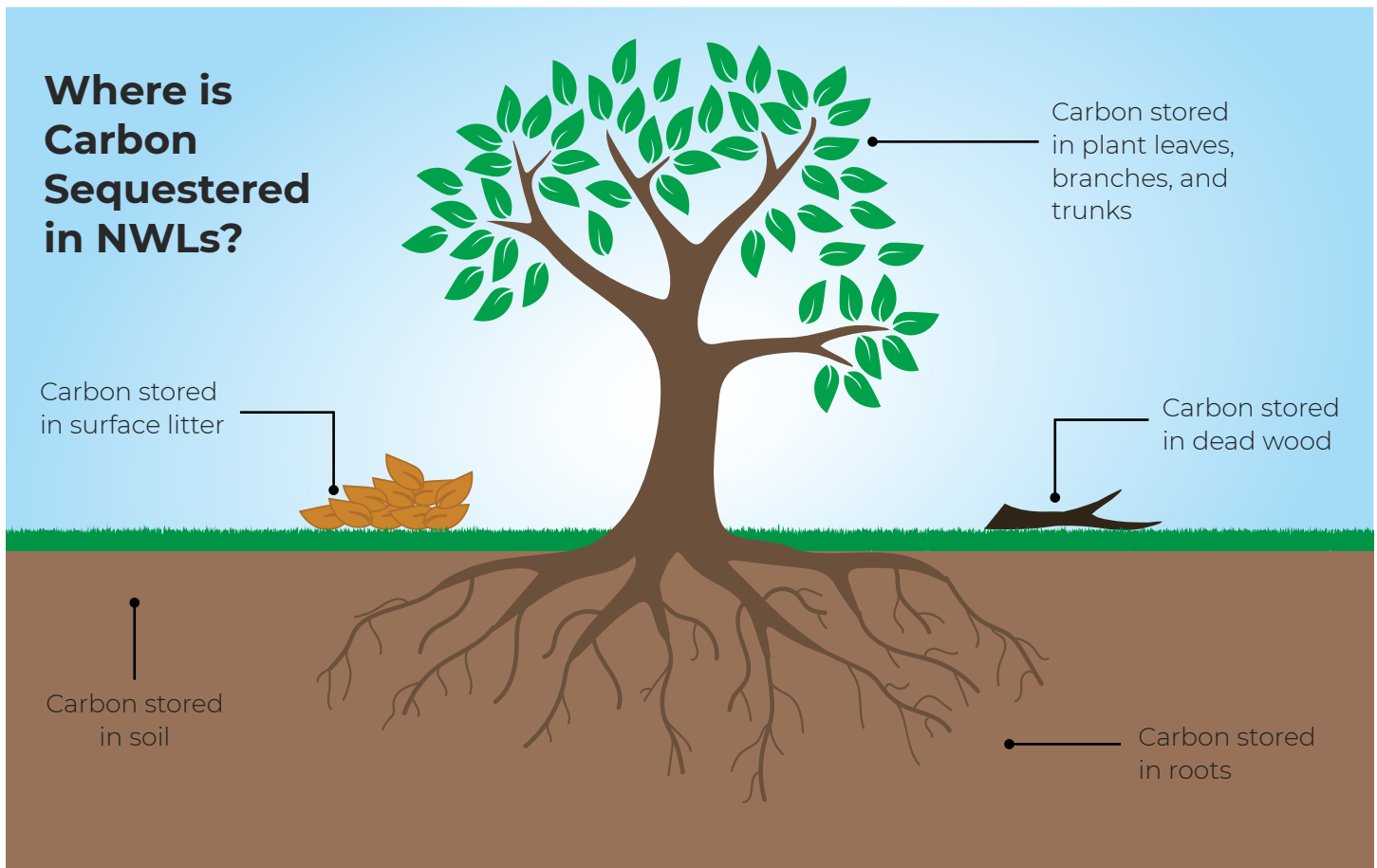
atmosphere that slows or reverses atmospheric CO₂ pollution to mitigate or reverse climate change¹. Healthy NWLs can sequester carbon and provide significant opportunities to reduce GHG emissions.

NWLs like farmlands, forests, grasslands, and wetlands are considered resilient carbon sinks - meaning they can store carbon for long periods of time so that it is not released into the atmosphere. Certain practices, such as regenerative agriculture for croplands and native habitat restoration for grasslands, can help these lands sequester even more carbon.

Assuming the City and its partners take swift, but achievable action to restore and manage NWLs, a conservative estimate of the carbon storage growth potential of San José's designated NWLs is 5 million metric tons of CO₂ equivalents (CO₂e) by 2050².

In addition to improving their ability to sequester carbon from the atmosphere, the enhancement of NWLs provides a variety of co-benefits including increased economic output, improved flood control, increased habitat preservation, and improved public health outcomes.

Where is Carbon Sequestered in NWLs?



NWLs remove carbon dioxide from the atmosphere and sequester it in soil and vegetation. Carbon is stored in plant leaves, branches, stems, trunks, and roots, in the soil, and in organic materials on the ground like dead leaves and wood.⁶

See
Section 3.1

Preserving undeveloped areas as NWLs also helps prevent suburban sprawl, which in San José could help avoid 21,120 metric tons of driving-related CO₂e being released into the atmosphere annually³. This is the equivalent of taking over 4,500 passenger vehicles off the road each year⁴.

Preserving and Enhancing NWLs

San José's NWLs are vulnerable to loss. Since 2001, San José has lost the equivalent of 45 football fields⁵ or roughly 1,200 acres of NWLs each year to urban development. Without thoughtful land use policy and NWL-focused investments, more of San José's critical

habitat, natural areas, and agricultural assets could disappear.

Strategies to preserve and enhance NWLs in this document focus on two distinct areas: land use policy and land management.

Land use policy strategies include potential changes to the General Plan and zoning regulations to encourage infill development and disincentivize greenfield development. Land management strategies include regenerative agriculture practices, native habitat restoration, and urban greening.

Advancing Equity

NWLs can have a direct and meaningful impact on social and environmental equity. NWL action, when implemented thoughtfully, has the potential to expand access to opportunity, improve health outcomes, and reverse historic patterns of disinvestment.

In order to ensure that NWL investments are distributed in an equitable manner, the City and its partners must evaluate their actions based on their potential to benefit historically marginalized communities. Defining these communities will be a crucial first step toward implementing the actions laid out in this element.

A Vision for 2050

If the City accelerates action today, there is much that can be achieved by 2050, and beyond. Setting realistic goals is an important first step to realizing meaningful progress for NWL preservation and enhancement.

These goals include increasing the land area of City-designated NWLs in the General Plan, reducing future development pressure on existing NWLs through pro-infill policies, and applying a range of regenerative and restorative practices to these lands to increase their ability to sequester carbon.

The City and its partners have set achievable progress milestones and will continue to monitor their progress as the recommendations in this document are implemented.

Getting It Done

To meet the 2050 goals set by the Paris Climate Agreement (Paris Agreement) and the City's carbon neutrality goals, bold action must be taken. The City will need the support of conservation organizations, non-profit partners, private landowners, advocacy groups, public partners, and funders to implement the recommendations of the NWL Element.

Climate Smart San José

One of the topics identified by Climate Smart for further study was to assess how San José's NWLs can provide further benefits related to carbon sequestration and avoided vehicle miles traveled (VMT).

This NWL Element provides that assessment of NWL benefits, along with strategies to protect and enhance NWLs as well as goals and metrics for tracking progress. These strategies, goals, and metrics will be integrated into the Climate Smart plan when it is next updated.



Rangelands overlooking San José (Credit: Shutterstock)

Key Findings

This NWL Element is based on an analysis of projected growth patterns in San José and 11 land management strategies that led to the following key findings



NWLs will help us meet our climate goals.

Today, San José's NWLs are an essential reservoir for carbon. Through partnerships to preserve and better manage them, they can reduce carbon dioxide in the atmosphere by roughly 5 Million MT of CO₂e between now and 2050 - roughly 5% of the reduction needed to meet San José's Paris Agreement target.



Restoring and enhancing NWLs can help protect our communities from the effects of climate change.

Managing and restoring NWLs can buffer our communities from catastrophic wildfires, flooding, drought and heat islands by providing space for fire management activities, capturing floodwaters, groundwater recharge and shading our cities.



NWL restoration and enhancement is a generational investment.

There are many ways to enhance and restore San José's NWLs. Though some NWL strategies need significant time to reach their full potential, once established, they will provide benefits for many years into the future.



How we grow matters.

How and where we grow matters because policies that encourage growth in infill areas not only help lower per capita GHG emissions but also reduce pressure on San José's NWLs, allowing these lands to sequester more carbon.



NWLs should benefit all communities.

Setting equity goals for NWLs can help us ensure that all members of our communities can enjoy their benefits.

01 Introduction

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Understanding Our Challenge

Supporting Climate Smart San José's vision to reduce greenhouse gas emissions

Climate Smart recognizes that many cities – including San José – are pledging to honor and uphold the Paris Agreement. San José takes its commitment to reduce GHG emissions seriously and has gone beyond Paris Agreement goals by adopting the goal of carbon neutrality by 2030. Given the urgency of climate

change and potential scale of climate change's impacts, the City recognizes that it will need to consider bold measures to counteract its GHG emissions, the key contributors to climate change.

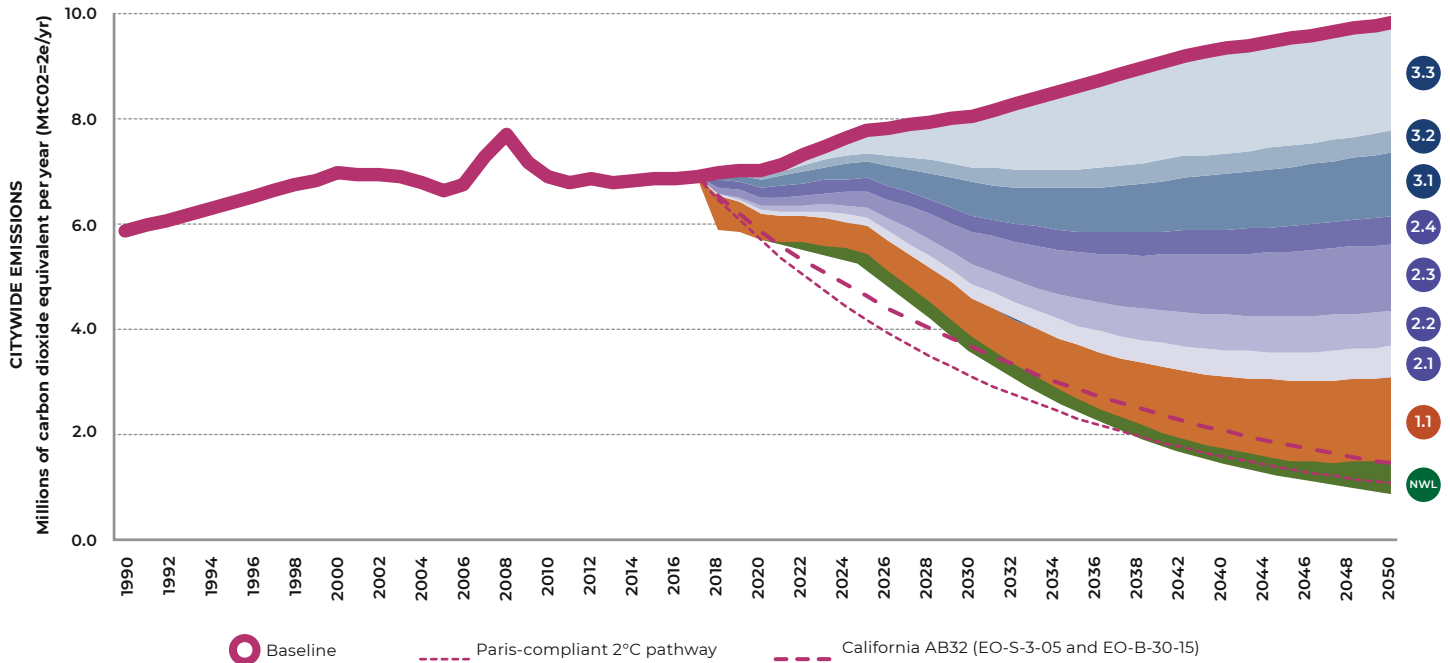
NWL preservation and stewardship are two

important ways that the City can meet its GHG reduction targets. This NWL Element of Climate Smart identifies strategies for NWL preservation and enhancement for integration into the Climate Smart plan.



Uvas Canyon (Credit: Santa Clara Valley Open Space Authority)

Meeting Paris Requirements



Climate Smart GHG Reduction Strategies

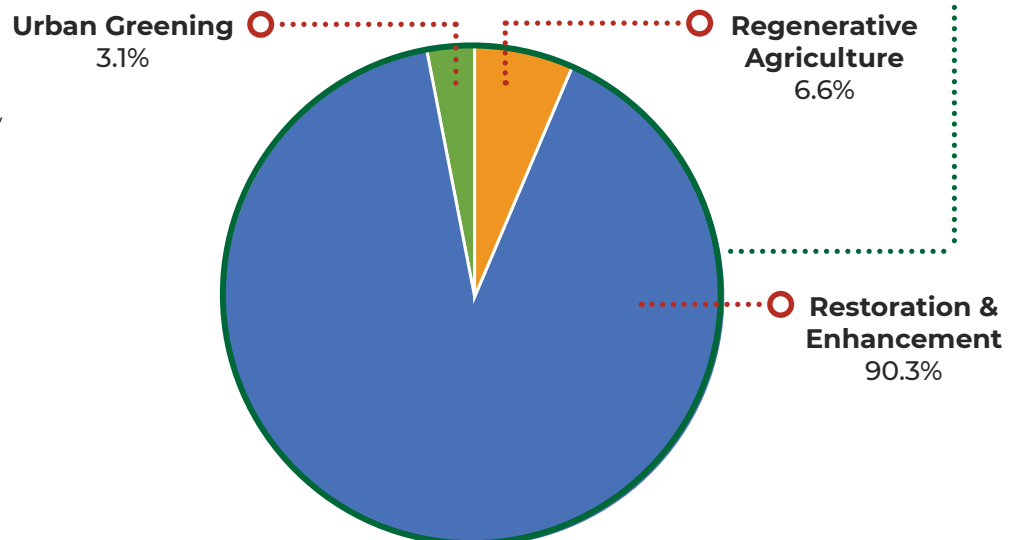
- 1.1** Transition to a renewable energy future
- 2.1** Densify our city to accommodate our future neighbors
- 2.2** Provide affordable, efficient homes for our families
- 2.3** Create clean, personalized mobility choices
- 2.4** Provide high-quality, accessible public transit infrastructure
- 3.1** Create local jobs in our city to reduce VMT
- 3.2** Improve our commercial building stock
- 3.3** Make commercial goods movement clean and efficient

NWL

Natural and Working Lands Element contribution to meeting the Paris Agreement

(~5.0 Million MT CO₂e over 30 years)

Sources of Annual Sequestration in 2050 (MT CO₂e)



Climate Smart includes 8 strategies that are intended to set the City on a trajectory to meet the goals set by the Paris Climate Agreement. As the chart above shows, no single strategy will allow the City to meet its goals by 2050. With the addition of a ninth group of NWL-focused strategies, the City now has a more diverse portfolio of options to help reach these ambitious goals.

Our Approach

Collaboration toward a common goal

Collaborative

Meeting ambitious climate change goals requires cooperation and collaboration to succeed. This project brought together a diverse group of stakeholders from the public, private, and non-profit sectors along with researchers and experts in environmental resource management and climate science. The City and the Santa Clara Valley Open Space Authority (OSA) led the creation of the NWL Element, supported by a Project Management Team and a Technical Advisory Committee.

Data-driven

To fully assess the benefits of NWLs and the strategies that might preserve and enhance them, we need an evaluation process driven by data. The findings in this report are data-driven, based on the results of a modeling process that evaluated the benefits of NWLs in San José and strategies for preserving and enhancing them. [The Natural and Working Lands Element Technical Report](#) provides an in-depth account of the carbon sequestration and land use policy modeling analyses.

Our Team

The work in this report was overseen by a Project Management Team and Technical Advisory Committee, with input from public stakeholders. See the Acknowledgments on page 3 for full list of technical contributors.

20 staff members from City departments and the Open Space Authority made up the Project Management Team. City departments represented include the Environmental Services Department, the Department of Transportation, the Office of Economic Development, and the Department of Planning, Building, and Code Enforcement.

30 subject matter experts made up the Technical Advisory Committee and helped guide the research and technical analysis, including research faculty from Santa Clara University, data scientists from the Nature Conservancy and the California Department of Conservation, and digital mapping and modeling specialists.

Stakeholders from the public and regional agencies were invited to weigh in during the process in a series of six stakeholder feedback sessions which informed the final NWL Element.

Current Context

NWL actions completed, underway, or on the horizon

NWLs are gaining attention from cities, counties, nonprofit organizations, and the State of California. As their profile rises, conservation and restoration of NWLs is increasingly seen as a key strategy for mitigating and adapting to climate change.

Statewide Climate Action: The 30 by 30 Executive Order and CARB's NWL Modeling and Scenarios Process

Much is being done at the state level to address NWLs in the context of climate change. In 2020, Governor Newsom issued a sweeping executive

order establishing a new “30 by 30” goal. This executive order directs state agencies to protect 30% of California’s NWLs and waters by 2030 for biodiversity, public access, and climate resilience.⁷ This bold target is complemented by the State’s “Natural and Working Lands Climate Smart Strategy” that focuses on GHG reduction



Coyote Valley (Credit: Santa Clara Valley Open Space Authority)



Alviso Marina County Park (Credit: Niranjan Vaidya). This image also appears on the cover.

via NWLs. Additionally, as part of California’s Climate Change Scoping Plan 2022 update, CARB is undertaking a modeling process which, for multiple scenarios, will estimate the potential impact of a suite of NWL actions associated with each scenario. Much like the work laid out in this report for the City and its SOI, CARB’s scenario modeling is expected to include baseline and business-as-usual scenarios and alternative scenarios that explore the impacts of different policies.⁸

Getting Silicon Valley On Track: Regional NWL Coordination

Much is being done at the regional level to preserve and restore NWLs. With the passage of Measure T, funding for the Open Space Authority’s

conservation efforts has been extended indefinitely.⁹ At the same time, the City of San José, Santa Clara County, and the Santa Clara Valley Transportation Authority (VTA) have all voted to declare a climate emergency in Silicon Valley, a major step toward aligning regional priorities around climate change.

Acting Locally: San José’s NWL Commitment

At the citywide scale, San José continues to make headway on NWL restoration and conservation. With the adoption of the Climate Smart plan and the San José Carbon Neutral by 2030 Resolution, the City has made a strong commitment to dealing with climate change. This commitment is evident in the City’s landmark Climate Smart

plan, which identified NWL planning as a potential GHG mitigation measure and topic for future consideration.¹⁰

More recently, the City has acted on its commitment to NWL conservation by successfully redesignating Northern Coyote Valley to Agriculture and Open Space uses within the General Plan, providing a model for rethinking plans for urban expansion and instead encouraging denser transit-oriented development. For more information on Coyote Valley, see the Spotlight on Coyote Valley section on page 53.

Current Planning Efforts

Some existing city, county, state, and regional land use and planning policies already consider the role of NWLs for climate adaptation and mitigation. The following table summarizes some of the current planning efforts in the San José area that include direction for NWL conservation, enhancement, or stewardship. Coordinated planning efforts and inter-organizational collaboration support NWL actions by building on organizational strengths, assuring that a diversity of community needs are being met, and addressing issues at a regional level.

Table 1: Current Planning Efforts

PLAN NAME	SUMMARY	RELATION TO NWL CONSERVATION, ENHANCEMENT, OR STEWARDSHIP	COORDINATING ORGANIZATION
State General Plan Guidelines (Last updated 2017)	These state guidelines for the preparation and content of general plans for all cities and counties in California are periodically revised by the California Governor's Office of Planning and Research (OPR).	The recommendations from these guidelines include the direction to address climate change in a General Plan or Climate Action Plan. This NWL Element will be part of the latter.	California Governor's Office of Planning and Research
Natural and Working Lands Climate Smart Strategy (2022)	This strategy identifies land management actions that help protect climate-vulnerable communities, achieve carbon neutrality, improve public health and safety, and expand economic opportunity.	The strategy describes how to plan and implement nature-based solutions and NWL conservation and restoration strategies.	California Natural Resources Agency
Pathways to 30x30 California: Accelerating Conservation of California's Nature (2021)	This strategy describes how the State will reach Executive Order N-82-20's goal of conserving 30% of state lands and coastal waters by 2030.	This strategy outlines objectives, strategies, and tools to catalyze conservation of the state's most critically important NWLs.	California Natural Resources Agency
California 2030 NWL Climate Change Implementation Plan (Draft Released 2019)	This plan sets California on an ambitious path forward for using forests, farmland, rangeland, grasslands, wetlands, and urban land to mitigate climate change while enhancing their resilience to worsening climate change impacts.	The plan aims to coordinate all state NWL programs under a united approach that will move these organizations toward their goal of maintaining a resilient carbon sink and improved air and water quality, water quantity, wildlife habitat, recreation, and other benefits.	California Natural Resources Agency, Department of Food and Agriculture, Environmental Protection Agency, CARB, and Strategic Growth Council
ActivateSJ Strategic Plan (2019)	This plan seeks to maintain, improve, and expand Parks, Recreation, and Neighborhood Services (PRNS) facilities, programs and services. It guides how PRNS cares for and develops a diverse park system and recreation programs and services for all in San José.	This plan prioritizes the maintenance and preservation of the city's outdoor spaces. It will help cultivate a park system that preserves nature, supports wildlife, and enhances community well-being.	City of San José
Climate Smart San José (2018)	Climate Smart San José is San José's climate action plan. It lays out strategies to help the City meet the goals of the Paris Climate Agreement.	The Climate Smart plan identifies NWLs as a topic for future consideration and analysis.	City of San José

PLAN NAME	SUMMARY	RELATION TO NWL CONSERVATION, ENHANCEMENT, OR STEWARDSHIP	COORDINATING ORGANIZATION
Community Forest Management Plan (2022)	This plan establishes standards and practices to help create and maintain a thriving community forest. The City is expected to complete a draft plan by October 2022.	The plan aims to increase the many community and environmental benefits of urban trees, such as trees in city parks, by maintaining and increasing the City's tree canopy cover.	City of San José
Dewatered Biosolids Management Strategy (2021)	The strategy lays out actions for managing and beneficially reusing the biosolids the San José-Santa Clara Regional Wastewater Facility will produce upon completion of the Digested Sludge Dewatering Facility.	The plan seeks to find ways to manage and beneficially reuse dewatered biosolids in a way that maximizes environmental benefits and minimizes negative impacts. Biosolids are being considered for application on certain NWLs to enhance soil and promote plant growth.	City of San José
Envision San José 2040 General Plan (2011, last updated 2021)	The City of San José's General Plan is its long term vision for growth. It governs land use, urban form, transportation, and housing.	The land use and transportation policies in the General Plan directly and indirectly impact San José's NWLs. It also includes policy guidance related to natural resources, open space, sensitive species, and riparian areas.	City of San José
Greenhouse Gas Reduction Strategy (2020)	This strategy builds on the City's Envision San José 2040 General Plan to meet the State's long term target of carbon neutrality by 2045.	This strategy identifies policies, plans, and programs that will contribute to GHG reductions, and serves as a GHG reduction plan to streamline GHG emissions analysis for California Environmental Quality Act compliance for future development and plans.	City of San José
Green Stormwater Infrastructure (GSI) Plan (2019)	This plan is a guide for reducing the adverse water quality, flooding, and urban heat impacts of urbanization by using green stormwater infrastructure like rain gardens and green roofs.	The GSI Plan includes goals to protect beneficial uses of waterways within San José, including the Bay, and to retrofit public right-of-ways with green stormwater infrastructure.	City of San José
Riparian Corridor Protection and Bird-safe Design Council Policy	This policy provides guidance for how riparian projects should be designed to protect and preserve the city's riparian corridors.	This policy increases protections for lands along creeks and streams in the city, promoting NWL preservation.	City of San José
Transportation Analysis Policy	This policy is designed to support San José's climate commitments to reduce GHG emissions by measuring and monitoring the amount of VMT generated by new development projects.	While this policy does not directly reference NWLs, it implements a state statute, SB 743, that is intended to discourage greenfield development and thus encourages the conservation of existing open space.	City of San José
Plan Bay Area 2050 (2021)	Plan Bay Area 2050 is the long-range plan for housing, economic development, transportation, and environmental resilience for the nine-county San Francisco Bay Area.	The plan includes preservation of open space and agricultural lands as a strategy for reducing GHG emissions and supporting focused growth.	Metropolitan Transportation Commission and the Association of Bay Area Governments

PLAN NAME	SUMMARY	RELATION TO NWL CONSERVATION, ENHANCEMENT, OR STEWARDSHIP	COORDINATING ORGANIZATION
Santa Clara County Community Climate Action Plan (2021)	This plan is a comprehensive roadmap that outlines actions for the County and partners to reduce GHG emissions. It is intended to complement other local strategies to allow for efficient countywide collaboration.	Through the development of this plan, the County is current looking to identify and engage with existing local and regional climate efforts - including San José's NWL strategies. Since 2018, the County has been implementing multiple strategies related to those in this Element.	Santa Clara County Office of Sustainability
Santa Clara Valley Agriculture Plan (2018)	This plan is a regional effort to conserve Santa Clara Valley's farm- and rangeland to support climate change mitigation and economic development.	The plan outlines opportunities to help conserve remaining working farms and ranches in the Santa Clara Valley. This includes farmland and ranches in the City of San José.	Santa Clara County and the Santa Clara Valley Open Space Authority
Santa Clara Valley Habitat Plan (2012)	The Santa Clara Valley Habitat Plan provides a framework for promoting the protection and recovery of natural resources while streamlining the permitting process for development, infrastructure, and maintenance.	The plan contains policies related to open space and habitat conservation, including policies that restrict development in riparian areas.	Santa Clara Valley Habitat Agency
Coyote Valley Conservation Areas Master Plan (Under Development)	The Coyote Valley Conservation Areas Master Plan is currently being developed to inform restoration of Coyote Valley while including community engagement and education and stewardship opportunities in the planning process.	This plan will create a roadmap for a resilient network of NWLs in Coyote Valley, one that can sustain biodiversity in a changing climate while also carefully managing/ restoring water resources and providing opportunities for quality of life benefits, including public access and agriculture.	Santa Clara Valley Open Space Authority
Santa Clara County Regional Conservation Investment Strategy (2020)	This strategy was developed to guide voluntary conservation and habitat enhancement actions for a suite of species and natural communities.	This strategy provides information about conservation activities needed to reduce pressures and stressors on the species included and identifies regional conservation priorities.	Santa Clara Valley Open Space Authority
Santa Clara Valley Greenprint (2016)	This detailed land and resource conservation vision will guide the Open Space Authority's work over the next 30 years.	This plan identifies nearly 122,000 acres of NWLs for conservation and provides strategies for open space acquisition and stewardship, for connecting urban residents to nature.	Santa Clara Valley Open Space Authority
California Climate Change Scoping Plan (2017)	This plan describes how California can reach its 2030 climate target. The next update of this plan will be published in 2022.	The plan includes strategies for supporting agriculture and NWL conservation and enhancement.	The State of California and the California Air Resources Board
One Water Plan (2021)	This plan integrates the water supply, flood protection, and stream stewardship missions of Valley Water at the watershed scale.	This plan has objectives to protect and maintain water resources and protect, enhance, and sustain natural ecosystems including riparian habitats.	Valley Water

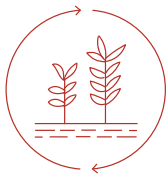
A Path Forward

Focusing our attention and efforts on the five following areas will move us toward our goals



NWL Preservation and Expansion

Sprawl development is the number one contributor to NWL conversions in San José. Introducing new policies and regulations that encourage development in central, walkable and transit-oriented areas can help relieve the pressures to convert NWLs for urban development.



Regenerative Agriculture

Shifting away from conventional agricultural practices to a more holistic approach for managing farm and grazing lands. Regenerative agriculture practices have, among other benefits, proven to both build up organic soil carbon and reduce CO₂ emissions.



NWL Restoration and Enhancement

Urbanization and industrial farming have severely degraded NWLs over the years. Several strategies exist to restore NWLs to a healthier state and enhance their ability to store and sequester carbon out of the atmosphere.



Urban Greening

Parks, trees, green stormwater infrastructure, and urban landscaping are valuable urban amenities that not only improve the quality of life of San José residents but also play an important role in sequestering carbon.



Carbon Tracking & Management

Accountability is everything - we need to track our NWL efforts to ensure we are in position to achieve our progress milestones and meet our climate goals.

02 Our Natural and Working Lands

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2.2 Co-Benefits – *Page 25*

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Our Natural and Working Lands

What are Natural and Working Lands?

NWLs can be defined as everything from open hillsides and farmlands to urban parks and trails.

The City defines NWLs as those areas designated in the General Plan as Open Space, Parklands, and Habitat, Agriculture, and Open Hillside, referred to here as ‘City-designated NWLs’.

Within these City-designated NWLs exist multiple natural and agricultural land cover types including woodlands, grasslands, shrublands, wetlands, riparian areas, rangelands, agricultural lands, and urban parks.

For example, land designated as Open Hillside might include a mix of woodlands, grasslands, shrublands and other native vegetation.

Despite being home to more than one million people, over 55% of San José’s sphere of influence is made up of City-designated NWLs.

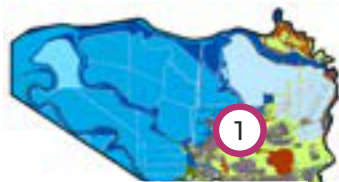


Coyote Valley (Credit: Derek Neumann via Bay Area Ridge Trail: <https://ridgetrail.org/coyote-valley-bay-nature/>)

The NWLs of San José’s Coyote Valley are home to agriculture and high-value native ecosystems, and provide outdoor recreation opportunities for residents and visitors.

San José's Land Cover Types

City-designated NWLs primarily encompass natural habitats and agricultural lands that exist outside of urbanized areas.



City-designated NWLs are also woven throughout the urban environment.

Open spaces, neighborhood parks, and trails are an important part of San José's NWL profile.



Credit: SJ Parks Foundation



Credit: Wikiloc



Credit: Visit Silicon Valley

1. Saline and freshwater wetlands account for 3% of San José's SOL.



Credit: Open Space Authority

2. Grasslands often seen covering San José's hillsides account for 13% of San José's SOL.

3



Credit: UC ANR

3. Oak woodlands are the most prevalent natural habitat surrounding the City - accounting for close to 20% of San José's SOL.

4. Despite San José's urban setting, agricultural lands are prevalent near the City's southern edge, accounting for 3% of San José's SOL.



Credit: Open Space Authority

Urban Land Cover

Developed
Landscaping
Light Vegetation
Dense Vegetation
Tree Canopy
Vacant

Natural and Agriculture Cover

Grasslands	Agriculture
Oak Woodlands	Riparian
Native Vegetation	Estuarine & Marine
Chaparral & Northern Coastal Scrub	Palustrine & Riverine
Conifer Woodland	Water

Map sources:

Department of Water Resources (DWR), Farmland Mapping and Monitoring Program (FMMP), San José tree canopy study, Santa Clara Valley Habitat Agency (SCVHA), California Aquatic Resource Inventory (CARI)

Co-Benefits

The health of our Natural and Working Lands is directly linked to the health of our climate and communities

Preserving and enhancing the health of NWLs can play a significant role in not only helping the City meet its GHG reduction targets but also providing a suite of positive environmental, community, and financial benefits that are commonly known as co-benefits. Climate Smart San José refers to co-benefits in its concept of the Good Life, which highlights the quality of life benefits of sustainability measures such as walkable neighborhoods and increased access to public transportation options and outdoor spaces that make San José a better place to live.

Co-benefits are the positive benefits related to GHG reduction strategies. Studies are increasingly showing that implementing climate policies targeting GHG reductions can also lead to additional benefits including cost savings, improved community health, cleaner air, native habitat preservation, supporting biodiversity, and an overall healthier ecosystem.¹¹



Coyote Valley is home to some of the last remaining farmlands in the San José area, making it a significant agricultural resource for the region. The North end of the Valley also serves as a critical wildlife corridor for the safe passage of animals.



Alum Rock Park / Sierra Vista Open Space Preserve, located east of San José's Berryessa, Alum Rock and Evergreen neighborhoods, are natural areas that provide residents with access to recreational activities as well as help reduce the risk of downstream flooding.



Baylands Wildlife Refuge provides a host of critical ecosystem services, including flood control and protection against storm surges, and serves as a critical stop for migrating and nesting birds.

Photo Credits: Santa Clara Valley Open Space Authority

What are a few example co-benefits of preserving and enhancing San José's Natural and Working Lands?

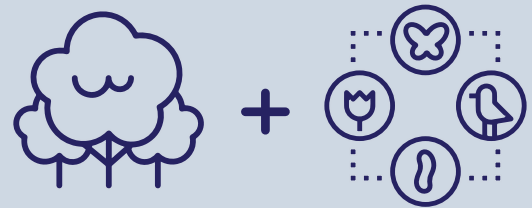
Core Benefit

- Enhancing and preserving NWLs would allow them to store an additional **5 Million MT¹²** of CO₂e by 2050. This is equivalent to the carbon stored in **27,600 railcars worth of coal¹³**. But carbon storage is only one of many benefits of investing in NWLs.



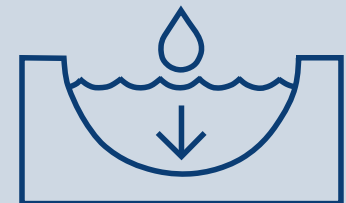
Co-Benefit

- Enhancing NWLs to sequester more carbon would restore nearly **9,000 Acres¹⁴** of threatened and endangered species habitat - an area roughly the size of **9 San José International Airports**.



Co-Benefit

- As San José grows, preserving greenfield sites as NWLs could prevent **264 Acre-Feet** of groundwater recharge potential from being lost¹⁵. This equates to **86 Million Gallons** of water storage in the Santa Clara Valley aquifer.



Co-Benefit

- Expanding our urban parkland, especially in historically marginalized communities, would create more tree-shaded areas, which can be **20-45°F cooler** during peak heat events than unshaded areas.



See
Section 3.1

Preservation and Enhancement

The future of NWLs in San José will depend on how we manage natural and agricultural resources as well as urban growth

Conversion and Loss

The historic ecology of San José is rich with biodiversity including oak savannahs, bayland wetlands, and native grasslands. Within San José's SOI, much of this original land cover has been degraded or displaced due to urban growth.

Despite the loss of NWLs over time, large swaths of natural landscapes and valuable farmland still remain outside of the City's urbanized areas. Adopting strategies that can help manage the City's future growth is key to prevent the loss of lands with the potential to sequester carbon from the atmosphere.

Since 2001, we have lost 1,200 acres of NWLs within San José's sphere of influence -- **that equates to about 45 football fields of NWLs lost each year.**

Two photos of the same area taken in 1935 and 2005 illustrating the degradation of riparian habitats that once existed along this now channelized portion of the Lower Guadalupe River.



Credit: UC Santa Cruz



Credit: History San José

Oak savannah in Coyote Valley, circa 1896. Close to 90% of historical Oak Savannah habitats that existed within San José's city limits have been converted to urban and agricultural uses.



Credit: NAIP

Minimizing NWL Loss, Maximizing Carbon Sequestration

The land use and land management policies that have been in place for the past 20 years have not been sufficient to stem the conversion, loss, and degradation of San José's NWLs. If preserving and enhancing NWLs is a priority for the City, new policies that will make better use of the land should be explored.

Land Use Planning

On its face, planning for urban development may seem to have little to do with the preservation of natural and agricultural landscapes. However, land use planning is of critical importance due to its **direct** and **indirect** impacts on the health and continued existence of NWLs.

Direct Impacts of Land Use Planning

Land use planning policies that directly impact NWLs include regulations that limit development in certain locations, conservation easements, and tax abatement programs like the Williamson Act.¹⁶

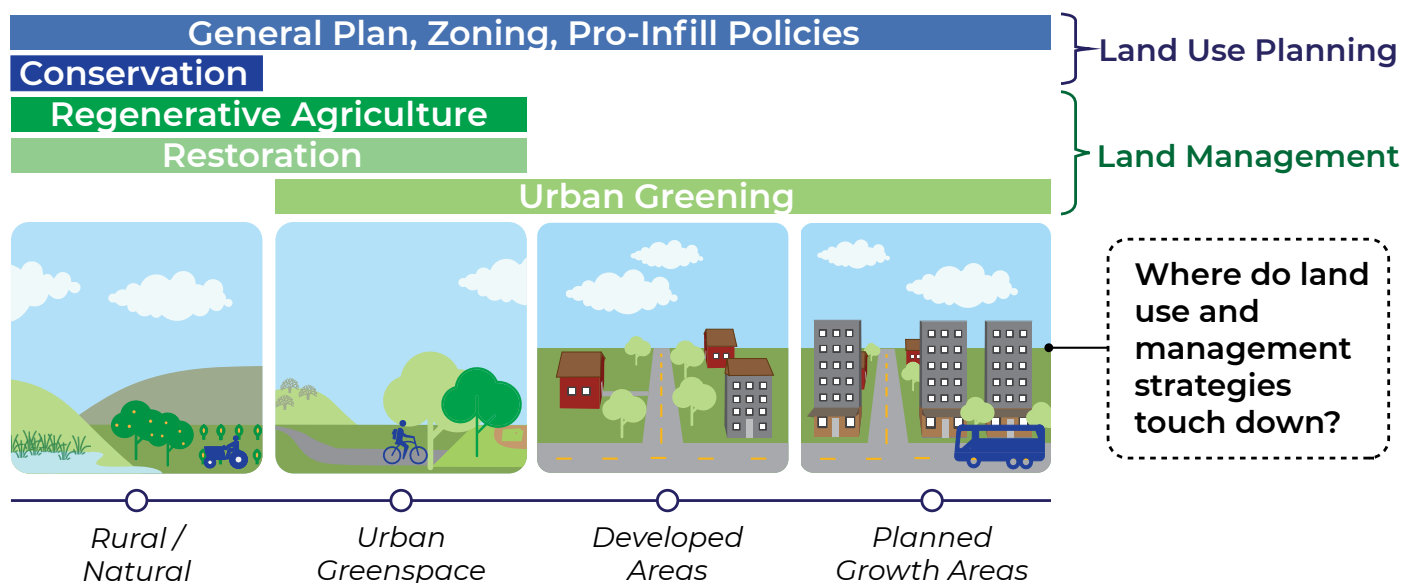
Indirect Impacts of Land Use Planning

Land use policy can often indirectly impact NWLs by incentivizing or regulating the location and density of urban growth. For example, policies that successfully enable greater densities in existing developed areas can reduce development pressure on large greenfield sites. Similarly, choosing not

to extend investments in infrastructure such as public transportation, roads, sewer, and water lines to these areas can further decrease their attractiveness as sites for urban development.

Land Management

Land management refers to a range of actions that can restore or enhance NWLs. The latter part of this section presents a variety of regenerative agriculture, restoration, and urban greening practices that can help maximize the ability of San José's NWLs to sequester carbon from the atmosphere.



Land management includes practices like regenerative agriculture, restoration, and urban greening. These practices apply to certain urban and rural settings. Land use planning has broader direct and indirect impacts on the long-term availability of land where such practices can be applied.

Land Use Strategies for NWL Preservation

By 2040, San José's population is projected to exceed 1.3 million. As the city grows, we will need to build housing, attract jobs, and provide amenities like schools and parks. Ensuring that NWLs remain a part of San José's future as the City evolves to accommodate new residents will require thoughtful land use policy.

The General Plan

One of the ways the City regulates land use is through the Envision San José 2040 General Plan. An important component of San José's General Plan is the call for focused and integrated growth. This acknowledges that San José's population will increase considerably by 2040, and that the most sustainable way of accommodating that growth

is to focus new housing and workforce development in targeted areas of the City. These planned growth areas, shown in red in the map below, call for higher-density, mixed-use, and transit-oriented development (TOD), making these neighborhoods economically diverse, walkable, and sustainable.

By finding ways to encourage growth in planned growth areas, the City's climate goals are supported in two ways. First, compact growth tends to produce less driving, lower energy use, and more efficient use of scarce water resources. Second, by accommodating growth in already-developed "infill" areas, development pressure is lessened on undeveloped open space "greenfield" areas largely composed of NWLs, making it

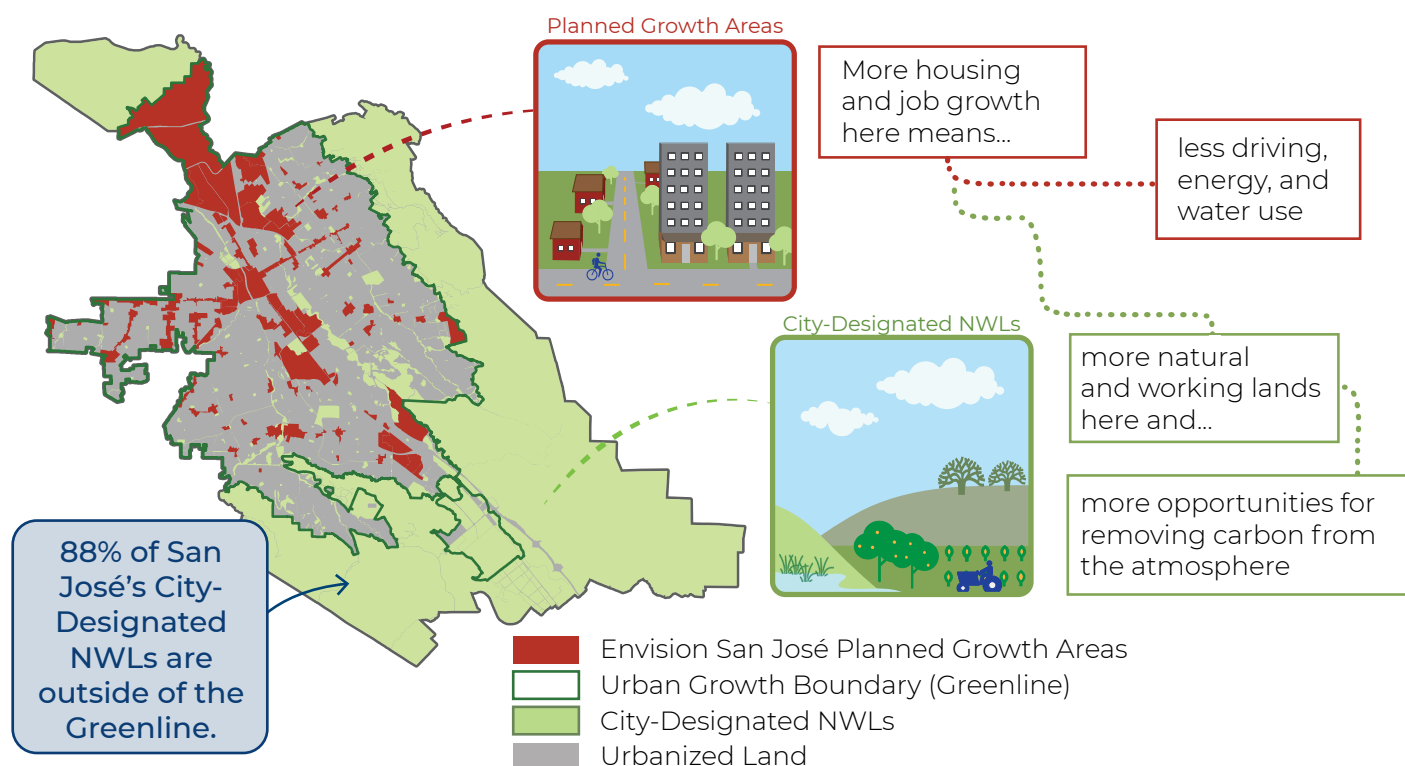
easier to preserve, expand, and enhance them.

Another important regulatory tool included in the General Plan is the Urban Growth Boundary (UGB), sometimes called the Greenline. This boundary, shown in the map below, is intended to manage where urban development is planned to occur within the City's SOI. As the map shows, the vast majority of San José's high value NWLs exist outside the Greenline. Continuing to minimize the expansion of the Greenline is key to preserving these critical lands and meeting our carbon reduction goals.

From Plan to Policy

General Plans are policy documents that evolve over time. As part of the

Land Use Policy - Directing Growth to Protect NWLs



recently-completed four-year General Plan update process, the City has adopted several new policies that will directly and indirectly preserve NWLs. These include the designation of Northern Coyote Valley as Agriculture and Open Space, Parklands, and Habitat and the shift of over 35,000 jobs from Coyote Valley.

These policy changes have the potential to mitigate GHG emissions, provide housing for new residents, and encourage the preservation of NWLs in San José. To measure the impacts of these and other policies, a series of land use policy scenarios were created for the NWL Element to see how the City might look in 2040 if actions are taken today.

Policy Scenarios

Scenarios allow us to ask “what if” and estimate the impacts that various plans or policies might have on our cities and regions. For the NWL Element, scenarios were used to test how land use and development policies existing in or proposed for the City’s General Plan might impact where and how NWL strategies can be deployed.

Four policy scenarios were developed to estimate the ability of land use policies to avoid GHG emissions and increase carbon sequestration potential on NWLs. Each scenario represents land use change across the entire San José SOI under a set of future policy conditions in the year 2040.

To assess the impact of policies, scenarios were measured against a baseline scenario representing existing General Plan policies. Scenarios were built using UrbanFootprint, a sketch planning tool used by

jurisdictions across California to model policy impacts in long range planning processes. Each policy scenario is summarized below:

Scenario 1: Greenfield Conservation

The “Greenfield Conservation” scenario tested the impact of conserving Northern Coyote Valley, at the southern edge of San José. Until recently, much of Northern Coyote Valley was designated as land for a future industrial and business park which was envisioned to host as many as 35,000 jobs. Instead of assuming the full build out of this area, this scenario shifted 35,000 jobs projected for that area to the downtown core.

Scenario 2: Reducing Parking Requirements

The “Reducing Parking Requirements” scenario tested the impact of reducing parking requirements city-wide while eliminating parking requirements in high-quality transit areas. High parking requirements are a major barrier to housing production because parking is expensive to build and can make denser housing types infeasible.

Scenario 3: Enabling Transit-Oriented Development (TOD)

The “Enabling TOD” scenario tested the impact of expanding the housing types allowed in high-quality transit areas. It assumed increased allowable densities in Regional and Local Transit Urban Villages as defined by the General Plan, as well as reduced parking requirements - a key component to enabling those densities.

This scenario also tested the impact of allowing a range of

middle housing types such as plexes, cottage clusters, and stacked flats in neighborhoods close to high quality transit.

Scenario 4: Enabling Infill in Neighborhoods

The “Enabling Infill in Neighborhoods” scenario focused on expanding the range of housing types in neighborhoods citywide. It tested the potential for more dense housing types near transit, as in the previous scenario, as well as the impact of allowing duplexes, triplexes and quadplexes in most of San José’s residential neighborhoods.

This scenario aligns with the “Building Opportunities for All” statewide housing package, including SB9, which allows for property divisions and duplexes in most residential zones, and SB10, which provides opt-in zoning for middle housing in transit-rich areas.

Learning from Scenarios

Scenarios provide a useful lens through which to understand how actions we take today could impact our ability to avoid emissions and sequester carbon in the future. The following findings are based on the most impactful policies.

Don’t Just Allow Density, Enable It

Increasing allowed heights and densities in transit-rich or infill locations makes sense, but those actions alone will have limited results if not coupled with other important regulatory changes. These include reducing parking requirements, relaxing setbacks, and increasing lot coverage allowances.

Look for Small-Scale Solutions

Small scale infill development can help shorten vehicle trips and reduce carbon emissions while reducing development pressure on greenfield sites. San José's neighborhoods have ample opportunities for incremental increases in density through the development of auxiliary dwelling units (ADUs) and middle housing. Regulations to encourage these housing types could, over time, add substantial housing capacity and effectively reduce the demand for shovel-ready greenfield sites at the urban edge.

Land Use Policy is NWL Policy

Given the availability of infrastructure and appropriate zoning, greenfield development will continue to compete with and detract from development opportunities in infill areas. Land use policies that enable infill development, while restricting or disincentivizing greenfield development, can shift this dynamic and reduce development pressure on high value NWLs in greenfield locations.

The City already has tools to manage growth in this manner. These include the General Plan Land Use Map and the Greenline / Urban Growth Boundary. The General Plan Land Use Map contains three NWL designations: "Open Hillside," "Agriculture," and "Open Space, Parklands, and Habitat". For lands with natural habitats that are not currently in one of these three NWL designations, redesignating them to fall in one of these NWL designations would restrict growth on these lands and ensure their continued ability to sequester carbon and provide co-benefits.

Outside of the UGB is where the majority (88%) of San José's NWLs currently exist. The City requires that development outside of the UGB remain rural and open in character, to preserve valuable open space and habitat resources. As the City grows, pressure to expand the UGB may increase. Continued maintenance and protection of the UGB is key to ensuring the future health of NWLs in San José.

Conservation Has Co-Benefits

High-value NWLs, such as Northern Coyote Valley, are increasingly rare and precious assets for the city. Recent City action to amend the General Plan and designate Northern Coyote Valley as Agriculture and Open Space, Parklands, and Habitat shows a growing understanding of the value of these places. Such conservation actions are critical, as opportunities for restoration of native plant communities, as well as regenerative agriculture practices will only exist if these properties remain undeveloped.

Permanent protection of these areas yields benefits that extend far beyond their property boundaries. As the "Greenfield Conservation" scenario showed, conserving land in Northern Coyote Valley means tens of thousands of commute trips would be diverted to more efficient locations within the City. This would save roughly 10 million vehicle miles traveled annually, which is equivalent to 14,000 metric tons of CO₂¹⁷.



Tilton Ranch (Credit: Santa Clara Valley Open Space Authority). This image also appears on the cover.

Policy Scenario Results

Policy scenarios were evaluated over a 20 year horizon using UrbanFootprint, a land use scenario modeling software, and an NWL Strategy Evaluation Model custom-built for San José. The results show that preserving and enhancing NWLs alongside land use policies that encourage infill could yield dual benefits of avoided emissions and carbon sequestration.

Policy Scenario Findings	Cumulative Transportation GHG Emissions Avoided (2021 - 2040) (Millions of MT CO ₂ e)	Cumulative Carbon Sequestered by NWLs (2021 - 2040) (Millions of MT CO ₂ e)
Greenfield Conservation (North Coyote Valley)	0.28	1.73
Reducing Parking Requirements	0.134	2.53
Enabling Transit-Oriented Development	0.898	3.36
Enabling Infill in Neighborhoods	0.695	3.34

Table 2: Cumulative GHG Emissions Avoided and Carbon Sequestered by Policy Scenario
Source: Cascadia Partners / UrbanFootprint



Scenario Evaluation Metrics

Using UrbanFootprint, a range of performance metrics were evaluated as part of the scenario analysis process. For a full reporting of the following performance metrics, see Appendix A: NWL Technical Report.


- Greenhouse Gas Emissions
- Groundwater Recharge Potential
- Carbon Sequestration Potential
- Criteria Pollutant Emissions
- Gentrification and Displacement Risk
- Terrestrial Habitat Preservation
- NWL Land Availability
- Fiscal Revenue
- Vehicle Miles Traveled
- Fire Hazard Impacts
- Habitat Connectivity
- Flood Impacts

Land Management Strategies for NWL Enhancement

Carbon sequestration is the long-term storage, removal, or capture of carbon dioxide from the atmosphere. Healthy NWLs sequester carbon and provide significant and cost-effective opportunities to reduce GHG emissions. NWL carbon sequestration strategies involve managing the use and development (in both urban and rural settings) of NWL resources and may include agricultural practices, reforestation, management of urban green space, or restoration of existing degraded NWLs. The potential benefits of eleven land management strategies were estimated for this Element. They are not a comprehensive list of strategies, but represent our view of the most effective strategies for carbon sequestration and emissions reduction in San José's SOI. These strategies have been organized into three categories: Regenerative Agriculture, Urban Greening, and Restoration.


Each strategy was evaluated based on City-designated and non-City designated land available for strategy application, carbon sequestration potential of applied strategy, the time needed for the strategy to reach maximum carbon sequestration, and the cost to implement a strategy. On the following pages, the eleven land management strategies are explained in greater detail.

Options for City actions to help implement each strategy are in Table 5, starting on page 58.




ACRES OF LAND WHERE EACH STRATEGY COULD POTENTIALLY BE APPLIED IN SAN JOSE'S SOI

Acres of land available today for strategy application given existing land uses and potential future land use changes.




CARBON SEQUESTRATION POTENTIAL

Cumulative per acre carbon sequestration potential of applied strategy over a 130-year time horizon. While many strategies reach peak sequestration much sooner, this time horizon was used to account for strategies that could take over 100 years to reach maturity.



TIME TO PEAK SEQUESTRATION

Time needed for strategies to reach maximum carbon sequestration. In some cases, ranges are provided to account for several substrategies.

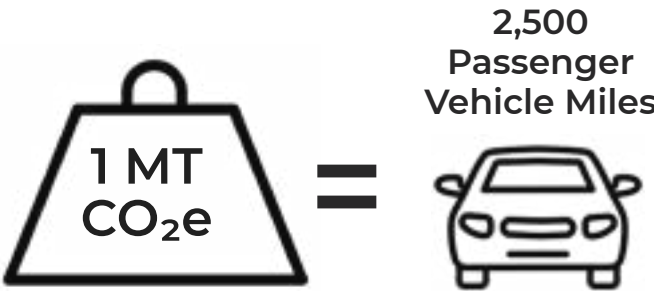


IMPLEMENTATION COST

Estimated cost per acre to implement the strategy. Cost estimates are broken down into two types of costs: initial costs per acre to implement a strategy and annual costs per acre to maintain strategy performance.

PUTTING IT INTO PERSPECTIVE • - -

The following land management strategies differ in how much carbon they sequester. Some sequester as little as 2.2 MT CO₂e per acre, while others have the potential to sequester over 20,000 MT CO₂e per acre. Given this wide range, it is helpful to understand that sequestering even 1 MT of CO₂e can offset approximately 2,500 miles driven by a passenger vehicle.



Regenerative Agriculture Strategies

Regenerative Agriculture strategies involve improving soil biodiversity, crop resilience and nutrient density in areas where soil is highly degraded, such as agricultural lands and urban greenspaces. Regenerative agriculture aims to reverse the effects of conventional farming practices by introducing alternative land management practices that have proven to reduce carbon emissions, increase carbon sequestration potential and support other environmental benefits such as improving plant growth and health and increasing water retention in soil.

Cropland Management



The cropland management strategy includes a package of specific management practices that provide multiple agronomic and environmental benefits beyond carbon sequestration, such as reducing soil erosion, maintaining and increasing soil quality and organic matter content, improving air quality, and enhancing soil moisture efficiency. These practices include planting cover crops, strip cropping, switching from conventional tillage to reduced tillage or no till and conservation crop rotation.



**5,625
Acres**



**2.2 MT
CO₂e
Per Acre**



**1 - 10
Years**



**\$0 / \$43
Initial / Annual
Cost Per Acre**

Grazing Land Management



Grazing lands are lands where livestock roam and forage on vegetation accessible within a few feet of ground level. The grazing lands management strategy includes a package of specific management practices that improve forage quality, soil and water quality, reduce erosion, improve shade for livestock and cover for wildlife, reduce fire hazards, and increase carbon sequestration in biomass and soils. These practices include prescribed grazing, range planting and silvopasture establishment.



**64,496
Acres**



**54.2 MT
CO₂e
Per Acre**



**20-100
Years**



**\$285 / \$44
Initial / Annual
Cost Per Acre**

Biosolids



Treated residuals from the wastewater treatment process - also known as biosolids - are considered a sustainable alternative to synthetic fertilizers. Applying them to agricultural lands will not only improve plant growth but also help sequester and store a significant amount of carbon directly to the soil for long periods of time. Their ability to improve soil structure also helps prevent erosion and runoff.



**5,625
Acres**



**16.5 MT
CO₂e
Per Acre**



**1-10
Years**



**\$0 / \$139
Initial / Annual
Cost Per Acre**

Mulching



Mulching involves spreading organic materials, such as shredded wood, straw, or other similar materials, on top of soil. Applying mulch can help increase soil nutrients, moderate soil temperatures, improve water penetration, limit weed growth and reduce the potential for erosion. Mulch is typically used to improve fertility and health of agricultural soils, increase the growth rate of trees and even help plant growth in private landscaping.



**11,388
Acres**



**3.7 MT
CO₂e
Per Acre**



**1 - 10
Years**



**\$0 / \$50
Initial / Annual
Cost Per Acre**

Compost Application



The compost application strategy replaces petroleum-derived inorganic fertilizers that contribute to atmospheric concentration of GHGs with organic matter deriving from the remains of composting plant, animal and waste material. Its use in agricultural systems has shown to increase the amount of carbon stored in both grassland and cropland soils and has important co-benefits, such as increased crop yields and water-holding capacity.



**73,780
Acres**



**432.1 MT
CO₂e
Per Acre**



**1 - 100
Years**



**\$0 / \$275
Initial / Annual
Cost Per Acre**

Urban Greening Strategies

Urban greening strategies include increasing access to urban green spaces and expanding tree canopy, both of which increase carbon sequestration potential. Strategy benefits include reduced air and noise pollution, more shade for cooling, and added habitat for local wildlife (especially when native tree species are chosen). These strategies can help urban areas in San José become more resilient to climate challenges and provide ecosystem services.

Urban Forest Expansion



Urban forest expansion focuses on increasing tree canopy outside of the public right-of-way (trees in the right-of-way are considered “street trees”), in areas such as parks, open spaces, and on private property. In addition to the carbon they sequester, urban forests help reduce urban heat island effects. Their presence can improve local air quality for residents and reduce the costs of cooling homes and commercial spaces.



**3,090
Acres**



**856.9 MT
CO₂e
Per Acre**



**80-150
Years**



**\$46,500 / \$2,640
Initial / Annual
Cost Per Acre**

Street Tree Planting



**125,000
Trees**



**6.6 MT
CO₂e
per tree**



**40-150
Years**



**\$775 / \$44
Initial / Annual
Cost Per Acre**

Restoration Strategies

Restoration strategies involve restoring natural areas that have been severely degraded or destroyed to their native state. The need for restoration strategies is a result of three kinds of threats: loss of existing native habitats due to urbanization, lack of plant regeneration (i.e. failure to reproduce), and habitat fragmentation. These strategies specifically focus on areas of San José’s SOI where native habitats used to thrive before they were displaced or degraded by urbanization.

Native Grassland Restoration



Native Grassland Restoration involves restoring native grasslands in areas currently covered by non-native grasses and associated species. Native grass species tend to have deeper root systems to allow them to reach deeper soil moisture to survive periods of extended drought and sequester much more carbon than non-native grasses, which tend to have more shallow root systems. Note that non-degraded native grasslands no longer exist within San José’s SOI.



31,733
Acres



33.6 MT
CO₂e
Per Acre



20 Years



\$2,000 / \$0
Initial / Annual
Cost Per Acre

Oak Woodland Restoration



Oak Woodland Restoration involves restoring oak woodlands in areas currently covered by non-native grasses where oak woodland ecological communities were historically located. Oak woodlands serve a number of important ecological functions including sequestering and storing significant amounts of carbon. In addition, they improve watersheds, provide critical wildlife habitat and enhance scenic beauty. While oak woodlands can store significant amounts of carbon, it can take over a century for oaks to reach their peak sequestration potential.



5,993
Acres



20,879.0 MT
CO₂e
Per Acre

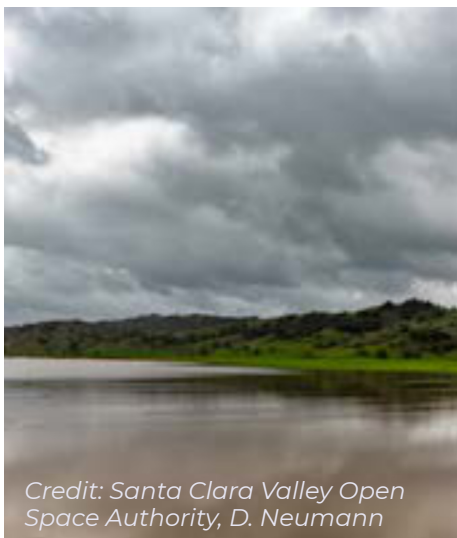


70-220
Years



\$12,427 / \$0
Initial / Annual
Cost Per Acre

Wetland Restoration



Wetland Restoration involves restoring both saline wetlands (baylands) and freshwater wetlands. Restored wetlands can help reduce GHG emissions by restoring plant habitats that sequester and bury carbon within accumulating soil. It should be noted that carbon accounting for wetlands is still an emerging field of research, and there are many factors that need to be understood before it is possible to accurately quantify the impacts of restored wetlands.



**5,972
Acres**



**105.0 MT
CO₂e
Per Acre
(Saline)**

**4,251.6 MT
CO₂e
Per Acre
(Fresh)**



**100
Years**



**\$365,000 / \$0
Initial / Annual
Cost Per Acre**

Riparian Restoration



Riparian Restoration involves increasing the density of woody plant species in and around stream and river corridors -- also known as riparian corridors. Restored riparian corridors can store significant amounts of carbon. With direct access to water sources, these areas are especially important to plant growth in dry climates like San José's.



**22,627
Acres**



**10,563.2 MT
CO₂e
Per Acre**



90 Years



**\$209,000 / \$0
Initial / Annual
Cost Per Acre**

Evaluation Summary of Land Management Strategy Application



Acres For
Application



MT CO₂e
Per Acre



Years to Peak
Sequestration



Implementation
Cost Estimate
Per Acre*
(Initial / Annual)

Strategy

Cropland Management	5,625	2.2	1 - 10	\$0 / \$45
Grazing Lands	64,496	54.2	20-100	\$192 / \$44
Biosolids	5,625	16.5	1-10	\$0 / \$139
Mulching	11,388	3.7	1-10	\$0 / \$50
Compost Application	73,780	432.1	1 - 100	\$0 / \$275
Urban Forest Expansion	3,090	856.9	80-150	\$46,500 / \$2,640
Street Tree Planting	125,000 (Trees)	6.6 (Per Tree)	40-150	\$775 / \$44 (Per Tree)
Native Grassland Restoration	31,733	33.6	20	\$2,000 / \$0
Oak Woodland Restoration	5,993	20,867.0	70-220	\$12,427 / \$0
Wetland Restoration	5,927	Saline: 105.0 Fresh: 4,251.6	100	\$365,000 / \$0
Riparian Restoration	22,627	10,563.2	90	\$209,000 / \$0

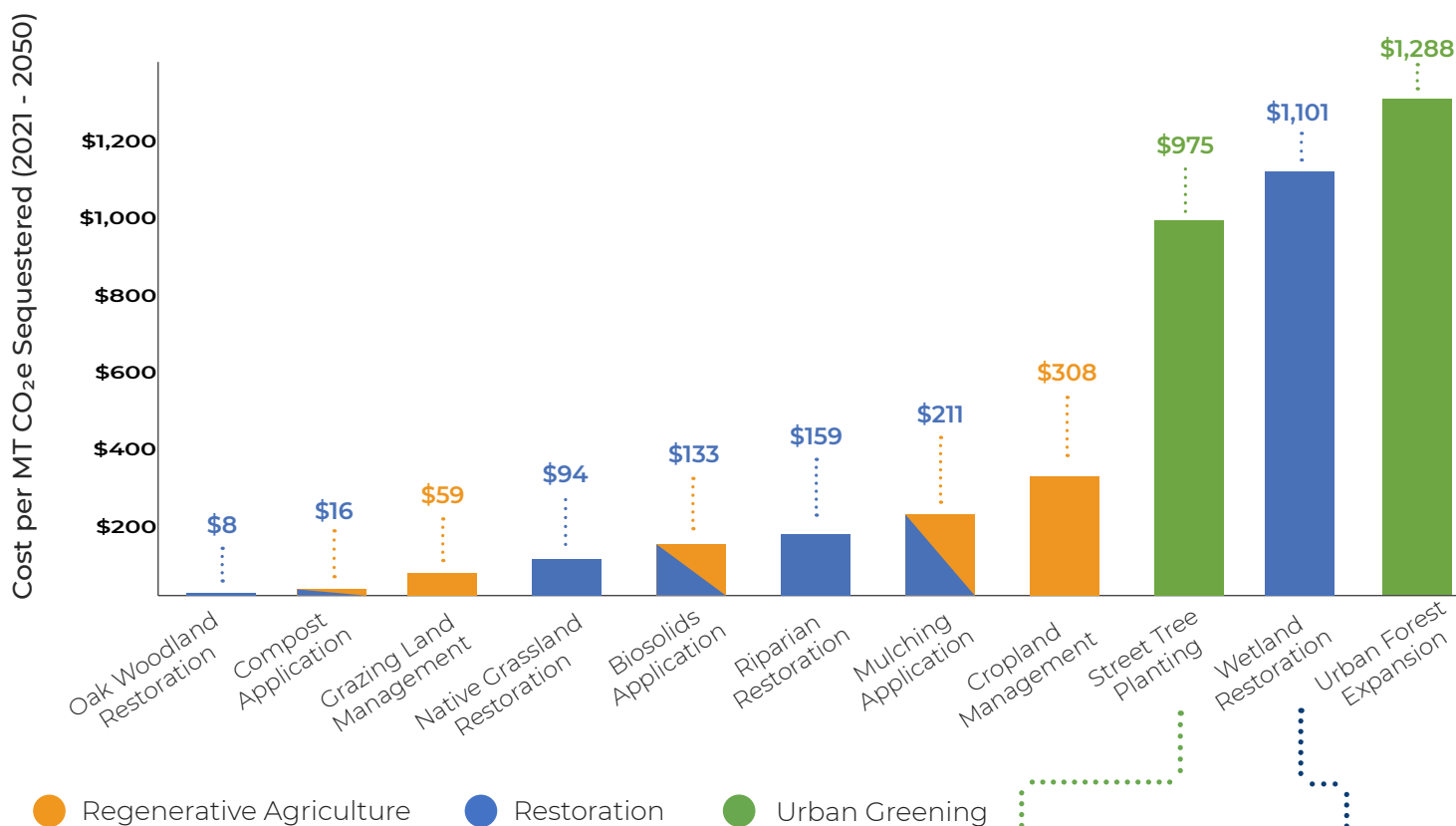
*See Appendix C for cost estimate sources and methodology.

Table 3: Summary of Land Management Strategy Evaluation Results.

Marginal Abatement Cost Curve (MACC)

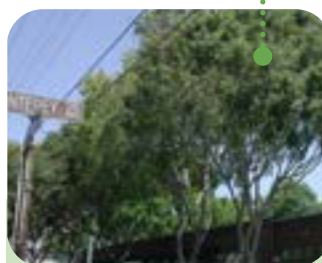
NWL strategies vary in terms of the amount of carbon they sequester and their up-front and on-going costs. One way to place NWL strategies on an even playing field is the Carbon Marginal Abatement Cost Curve (MACC). The MACC compares relative costs of each strategy over time to the amount of carbon each can sequester. As the chart below shows, cumulative MACC values (cumulative costs over cumulative sequestration) range from under \$8 to over \$1000 / MT CO₂e abated.

Cumulative Cost Estimate per Cumulative MT CO₂e Sequestered (2021 - 2050)



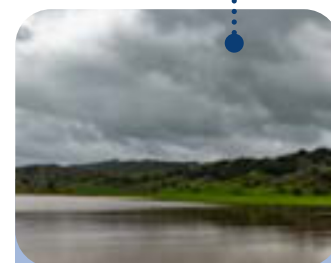
The MACC as a Decision-Making Tool

The MACC is helpful as a strategy prioritization tool, but it should be only one of many considerations made when choosing how to use scarce public dollars. Potential co-benefits, such as a strategy's ability to mitigate harmful impacts of climate change, should be weighed alongside the MACC. In addition to co-benefits, the ease of implementing each strategy should also be considered. Staffing resources, land availability, and required collaboration with land owners and other agencies need to also be factored into the decision-making process.



Urban Tree Planting:

Expanding tree canopy can mitigate the "urban heat island" effect, which disproportionately impacts historically marginalized communities.



Wetland Restoration:

Provides benefits to threatened and endangered species, can improve water quality, and mitigates downstream flooding.

Generational Investments

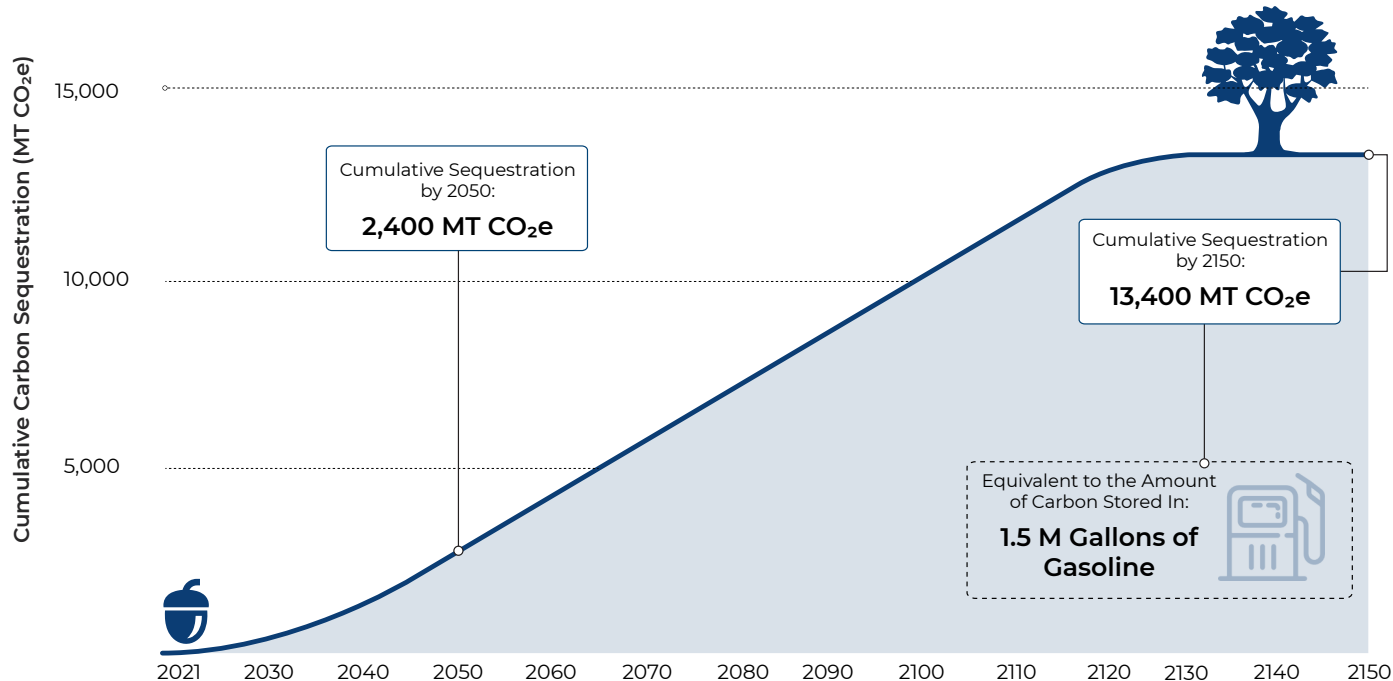
Investing in restoration and enhancement of San José's NWLs will pay dividends far beyond 2050.

Many of the land management strategies discussed in previous pages take many decades to fully mature and can provide benefits to future generations of San José residents. For example, an acre of valley oaks, planted in a restored hillside habitat today, could continue to sequester carbon well into the next century.

Clearly, NWLs can do more than just help meet the 2050 goals set by the Paris Agreement. Investments made today can continue to reduce carbon in the atmosphere well into the future and provide substantial additional benefits.

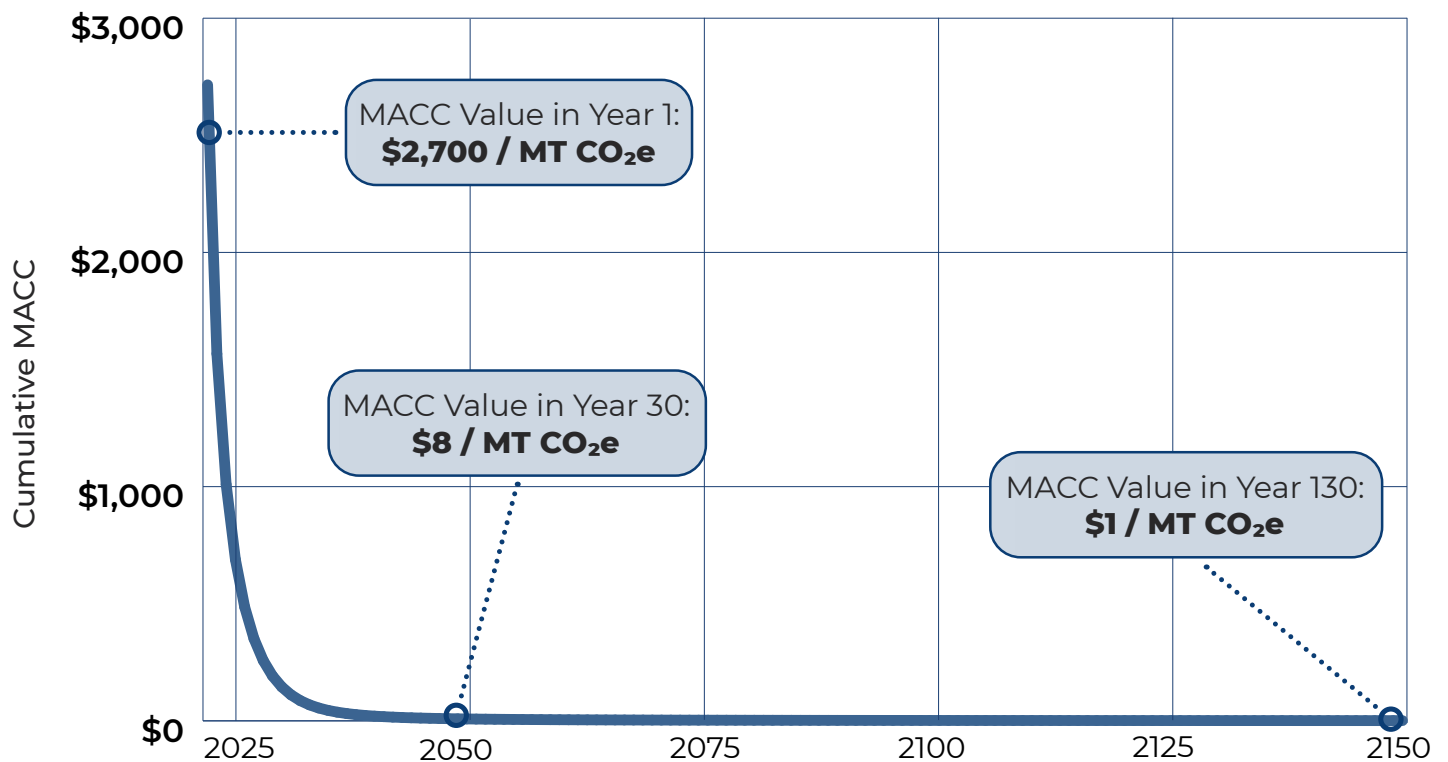


Sequestration Over Time (MT CO₂e): 1 Acre of Valley Oaks, Planted in 2021



Taking the Long View

Oak Woodland Marginal Abatement Costs Over Time (\$ / MT CO₂e Sequestered)



For some NWL sequestration strategies, time is everything. Many of the strategies discussed in this document involve plant communities, such as oaks, that can live for several centuries. As these plants grow, they sequester carbon from the atmosphere.

Not only do these plants grow for a very long time, the rate at which they grow and sequester carbon also changes as they mature. Because oaks do not reach their peak sequestration until they are well over 100 years old, their sequestration benefits cannot be fully appreciated unless they are viewed over many decades.

Many of the NWL strategies we have examined have both up-front implementation and on-going maintenance costs associated with them. As strategies mature, their rate of sequestration increases. This means that predictable upfront and annual strategy costs provide bigger payoffs the longer they are applied.

As the example above shows, a hypothetical acre of Valley oaks, planted in 2021, has a relatively high cost per MT CO₂e sequestered after 1 year. This is because the oaks have not yet had a chance to mature and are not yet sequestering large amounts of carbon.

As our hypothetical acre of oaks matures, annual sequestration rates increase. This means that each year, the same acre of oaks sequesters more carbon than the year before.

As the chart above shows, after 30 years the MACC value drops to \$8 per MT CO₂e sequestered. The long life and sequestration period for oaks means that by the year 2150, the cumulative cost of planting our acre of oaks in 2021 relative to their cumulative carbon sequestration approaches \$0.

Advancing 03 Equity

3.1 How NWL Strategies Can Advance Equity – *Page 44*

3.2 Keeping Ourselves Accountable – *Page 47*

How NWL Strategies Can Advance Equity

Equity Goals for NWLs

A legacy of discrimination and systemic injustices have resulted in a lack of access to NWLs for some Californians, especially California Native American tribes and communities of color. This lack of access has caused inequities including an increased exposure to environmental pollution and the impacts of climate change, limited access to nature, reduced opportunities to farm and manage land, and loss of sacred lands and the ability to steward them. The City is committed to institutionalizing a racial equity practice across the organization to create transformation for communities that have historically and continue to be marginalized. Setting equity goals for NWLs can help us address and repair the damage of this legacy and better protect and manage our NWLs so that all members of our communities can experience their benefits.

Goal 1

Protect our community from the impacts of climate change, with a focus on our most vulnerable populations

Invest in NWL strategies that protect vulnerable populations from climate impacts and build community resilience.

Goal 2

Increase access to quality green jobs and job training

Provide workforce development opportunities in the natural and working lands sector for residents from historically marginalized communities.

Goal 3

Increase access to natural resources for historically marginalized communities

Increase presence of green spaces and parks in communities with the least access to nature and recreational spaces.

Goal 4

Build relationships with California Native American tribes

Develop long-term partnerships with California Native American tribes to increase co-management of NWLs on public land and ensure the preservation of natural cultural resources and landscapes and access to sacred spaces.

Goal 5

Prioritize financial incentives and other resources for farmers of color to engage in sustainable farming

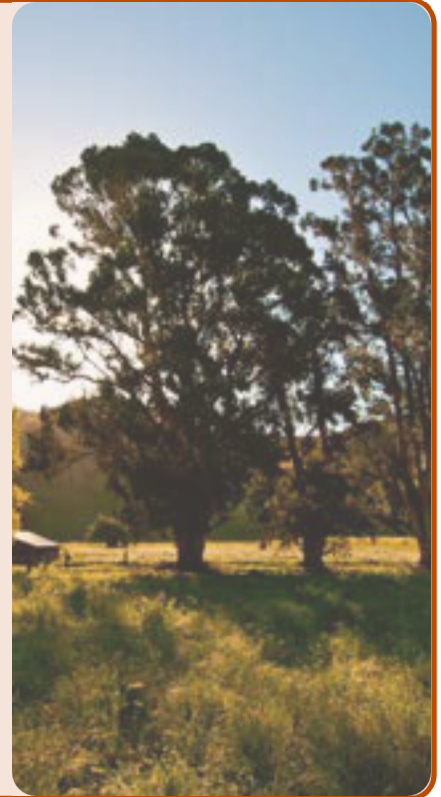
Prioritize financial incentives and other resources for farmers of color to scale up their existing efforts to preserve and restore NWLs.

Relating NWLs to Equity

Urban Greening Can Reduce Heat Impacts

Unusually hot summers and extreme heat events are becoming more common and intense across the world. This is especially true in cities where dense concentrations of pavement and structures absorb and retain heat at higher rates than natural green surfaces. This phenomenon is known as the 'urban heat island effect' and poses a serious threat to the health of city residents.

The cooling effect of city parks, trees, and green stormwater infrastructure is key to mitigating the health impacts of extreme heat in cities. Unfortunately, not everyone has equal access to these amenities. Exclusionary housing policies have pushed low-income households and communities of color into neighborhoods with fewer resources and amenities. This has led to today's heat exposure disparities observed across income, race and ethnicity. Implementing and investing in urban greening strategies in historically disinvested neighborhoods is a step toward reducing health and social inequities.



Urban Agriculture Can Increase Access to Healthy Foods

For many communities, access to fresh and healthy food is not a given. Grocery stores, community gardens and farmers markets are primary sources of healthy foods for city residents. Unfortunately, these sources are more scarcely found in communities of color and low-income neighborhoods compared to more affluent neighborhoods. These underserved neighborhoods are sometimes characterized as 'food deserts' - areas where access to affordable and healthy food options is restricted or nonexistent due to the absence of conveniently-located grocery stores.

Urban agriculture has gained momentum across cities as one approach to address inequitable access to affordable healthy foods. Urban farms have the potential to create local healthy food systems in neighborhoods that lack access to fresh produce. The practice comes with other community benefits such as workforce training and job development, community building and farming education opportunities.

Local Examples of Equity-Focused NWL Action

NWLs can have a direct and meaningful impact on social and environmental equity. NWL action, when implemented thoughtfully, has the potential to expand access to opportunity, produce better public health outcomes, and reverse historic patterns of disinvestment and exclusionary practices like redlining. In San José, numerous efforts are already underway to bring the benefits of NWLs to communities that have long lacked these investments and resources. These programs can provide a helpful blueprint for City-led equity-focused NWL action.



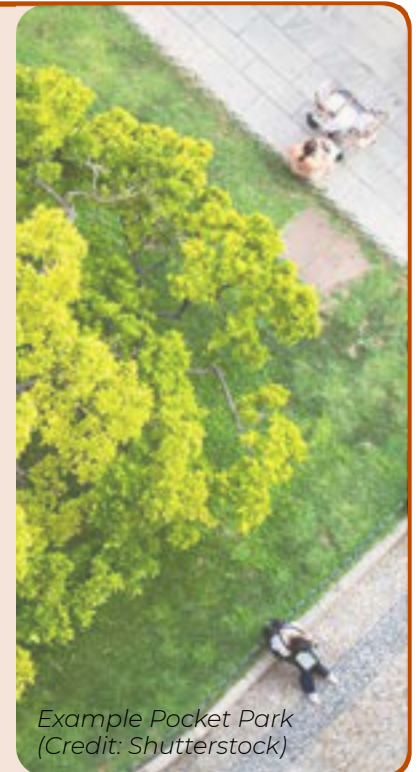
Veggielution (San José)

The mission of Veggielution is to connect people from diverse backgrounds outdoors through food and farming to build community in East San José. The 2-acre community farm and gathering space is located in Emma Prusch Farm Park in the Mayfair neighborhood, one of the most impoverished areas in Silicon Valley. Mayfair residents suffer from conditions that affect many immigrant and working-class populations, including higher rates of obesity and diabetes, significant education and earning gaps, lack of access to safe, well-maintained outdoor spaces, and limited options for fresh, healthy food. Through food-centered programs for all ages, Veggielution connects residents to each other and to people and resources from outside their community that will enable them to make change and the farm provides a critical platform for these programs.

Havana Field Pocket Park (San José)

The Santa Clara Valley Open Space Authority's Urban Grant Program provides funding for projects that help address needs within urban communities, including those that seek to build more equitable access to parks, preserves, and other NWLs. The Open Space Authority awarded \$250,000 to transform an unused street right of way into a neighborhood pocket park that features a mural as well as shrubs, trees, and other green elements, called the Havana-Midfield Pocket Park.

The project was originally proposed by Latinos United for a New America (LUNA), a San José-based non-profit organization focused on unifying the community to achieve real, long-lasting changes in the areas of jobs, education, and health. LUNA, in partnership with the City of San José, worked closely with the community to develop a conceptual design that served the neighborhood. The City is now managing the final design and expects to begin construction soon. LUNA continues to play a core role in the project.



*Example Pocket Park
(Credit: Shutterstock)*

Keeping Ourselves Accountable

Equity Goals for NWLs

Over the coming years, the City and its partners will begin to implement the recommendations in the NWL Element. Assessing the impact of these actions on social and environmental equity will need to be part of the decision-making process. The equity goals defined in this section are linked to recommendations in *Section 5.1: Future Actions and Policies*. *Section 4.1: What Does 2050 Look Like?* provides metrics and milestones that will track our progress toward a more climate smart San José and how our actions are impacting historically marginalized communities.



Defining Historically Marginalized Communities

Historically marginalized communities, sometimes also referred to as under-resourced, disadvantaged, or vulnerable communities, have experienced disinvestment and lack of resources in the places they live and work. These communities may also experience increased sensitivity to climate change and have fewer resources to cope with, adapt to, or recover from climate impacts¹⁸. They are more vulnerable to these impacts due to built-environment, social, and economic factors resulting from discrimination, segregation, and disinvestment.

As the City and its partners continue to designate lands as NWLs and invest in enhancement and management strategies, it will be important to prioritize investments in historically marginalized communities. Defining these communities within San José is a crucial first step toward ensuring NWL actions are furthering social and environmental equity.

In the United States, **historic marginalization** stems from years of state sanctioned policies, practices, procedures and attitudes that advantage one social group over another. Historically marginalized communities include people of color, Black people, Indigenous people, immigrants, refugees, people with low incomes, people experiencing poverty, people experiencing homelessness or insufficient housing, English language learners, people with disabilities, people disproportionately affected by climate change impacts, and other communities that are systematically denied full access to rights, opportunities, resources, and power.

Measuring Vulnerability

Many resources exist to help San José measure social vulnerability, climate risk, and capacity for adaptation. Recent and on-going efforts to define vulnerability at the local and regional scale will provide helpful context. Existing data sources, such as CalEnviroScreen and the Urban Heat Island Index can provide additional resources for a local measure of vulnerability.

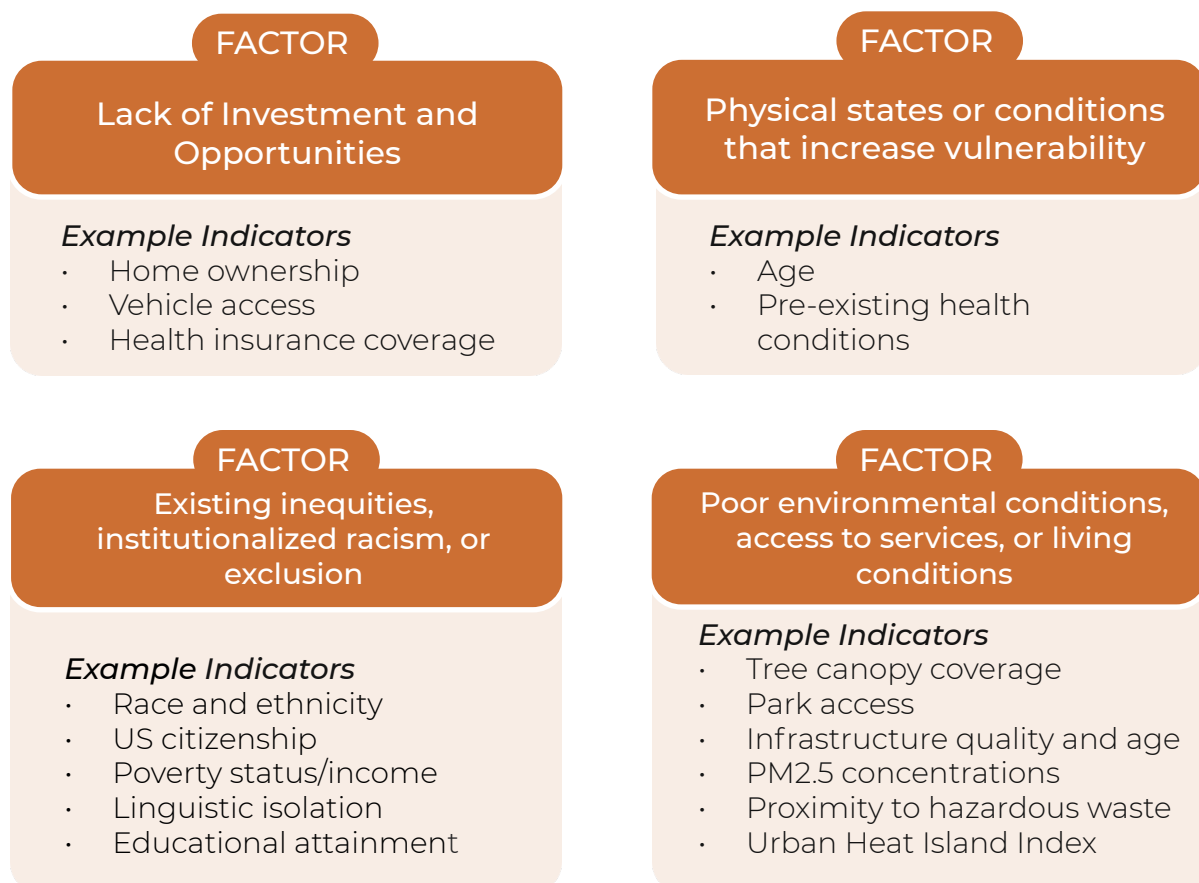
Relevant Existing City Efforts

ActivateSJ is San José's plan for Parks and Recreation. The plan utilizes the Trust for Public Land's ParkScore Index to analyze public access to existing parks and open space. The analysis determines where there are gaps in park access and creates a demographic profile to identify gaps with the most urgent need for parks.

The Department of Transportation Equity Taskforce is a partnership between the City of San José and nine leaders from community-based organizations representing the city's Black, Indigenous, Latino, Asian, Pacific Islander, and other marginalized communities.. The taskforce helped develop the Emerging Mobility Action Plan (EMAP). As part of this work, the taskforce will help create a collaborative and equitable decision-making process for City-led transportation investments.

Example Vulnerability Factors

The figure below provides an initial framework for identifying climate-vulnerable and historically marginalized communities, as defined by the California Office of Planning and Research (OPR)¹⁹. Along with meaningful public and stakeholder engagement, it could serve as a potential first step toward developing a historically marginalized community definition tailored to the unique conditions in San José.



What Does

04 2050 Look Like?

4.1 A Vision for 2050 – *Page 50*

4.2 Spotlight on Coyote Valley – *Page 52*

What Does 2050 Look Like?

A Climate Smart Vision for San José's NWLs

San José is already taking important steps that will help the region realize the full potential of NWLs by 2050. Recent conservation efforts in tandem with critical updates to the General Plan have demonstrated the commitment shared by the City and its partners to conserving and enhancing valuable NWLs. But more work needs to be done to ensure San José meets its 2030 and 2050 climate goals.

Carbon Reduction

If managed proactively, San José's NWLs have the potential to provide over 5% of the carbon reductions needed to meet Paris Agreement goals for 2050. Achieving these reductions will require a combination of conservation, sequestration-enhancing practices, and monitoring over time.

NWL Protection

In order for NWLs to provide sequestration and other co-benefits, they need to be protected from conversion and loss. Over the coming decades, San José will continue to use tools such as the General Plan and the Greenline to manage growth while working with conservation advocates to permanently protect sensitive lands.

Regenerative Agriculture

Working lands are a critical piece of San José's identity and economy. As 2050 approaches, the City and its partners will work with farmers and ranchers to encourage agricultural practices that enhance carbon sequestration, reduce water consumption, and preserve natural habitats.

Restoration and Enhancement

San José's natural landscapes exist in urban and rural contexts and can contribute even more to carbon sequestration if they are proactively managed. Over the coming decades, the City and its partners will find opportunities to apply restoration and enhancement strategies to more of these areas.

Urban Greening

San José's parks, trails, trees, and green stormwater infrastructure don't just represent an opportunity for carbon storage; they also have great potential to improve the wellbeing of its residents. In the coming decades, the City will continue to invest in its urban green spaces, with a particular focus on expanding access to neighborhood parks.

Vision

As the City plans for growth, San José will aim to minimize the loss of City-designated NWLs and increase the carbon sequestration potential of City-designated NWLs through land management practices.

NWL Preservation and Restoration Milestones

INDICATORS	NWL Preservation and Expansion*	Regenerative Agriculture	NWL Restoration & Enhancement	Urban Greening
METRICS	Acres of land with a NWL General Plan Land Use Designation	Acres of land with regenerative agriculture practices applied	Acres of NWLs with restoration or enhancement practices applied	Neighborhood / community serving parkland per 1,000 people
EQUITY CONSIDERATIONS	Prioritize lands near historically marginalized communities, after these are defined. Prioritize lands with Indigenous cultural significance.	Provide grant funding for farmers of color, especially those who provide fresh produce to local markets.	Prioritize lands near historically marginalized communities, after these are defined. Prioritize lands with high Urban Heat Island Index.	Prioritize lands near historically marginalized communities, after these are defined. Prioritize lands with high Urban Heat Island Index.
PROGRESS MILESTONES	Total acres of land designated as "Open Hillside", "Agriculture", or "Open Space, Parklands and Habitat"	New acres of City-designated NWLs with carbon farming / regenerative practices continuously applied.	New acres of City-designated NWLs with restoration or enhancement practices applied.	Total acres of neighborhood / community serving parkland within San José city limits.
TODAY	94,027	-	-	2,938
2030	94,200	3,700	4,500	3,700
2040	94,400	7,500	9,100	4,500
2050	94,600	11,200	13,600	5,200

*On vacant, non-employment lands not suitable for development

Table 4: NWL Preservation and Restoration Milestones.
Source: Cascadia Partners

Spotlight on Coyote Valley

Coyote Valley as a Model for Progress

An innovative public-private partnership led by OSA, Peninsula Open Space Trust (POST), and the City of San José is helping protect nearly 1,500 acres of open space and agricultural land in Coyote Valley at San José's southern edge. In addition, recent City action to redesignate Northern Coyote Valley to Agriculture and Open Space uses within the General Plan will insure its continued conservation.

These efforts will reestablish wildlife corridors, support local agriculture, and represent the City's first major step toward meeting the milestones set forth in this NWL Element.

The benefits of conservation in Coyote Valley will be

far-reaching and could provide a model for what it will take to achieve the City's NWL milestones. But conservation is only the first step - in order to leverage progress in Coyote Valley, the broader benefits of conservation must be recognized, carbon sequestration potential maximized, and innovative ways of funding progress identified.

Broader Benefits of Conservation

The bold moves made by the City and its partners to conserve NWLs will have broad impacts on San José that extend far beyond Coyote Valley.

Climate Resilience

Restoration of the Laguna Seca wetland and Fisher Creek floodplain will provide natural flood protection, reducing peak flood flows in vulnerable communities along Coyote Creek up to 9% and delaying flood peaks up to 3 hours.²⁰

Reduced Driving

In November 2021, San José City Council approved redirecting future employment growth from Coyote Valley into the Downtown West project in downtown San José. This change in land use designation and the associated shift in development is likely to result in 10 million fewer miles driven each year - the equivalent of 14,000 metric tons of CO₂.²¹



Coyote Valley (Credit: Santa Clara Valley Open Space Authority)

Management and Restoration

Today, the agriculture and rolling hills of Coyote Valley represent a significant reservoir of carbon for San José, but with careful management and restoration, its soil and vegetation can play an even greater role in helping the City meet its climate goals.

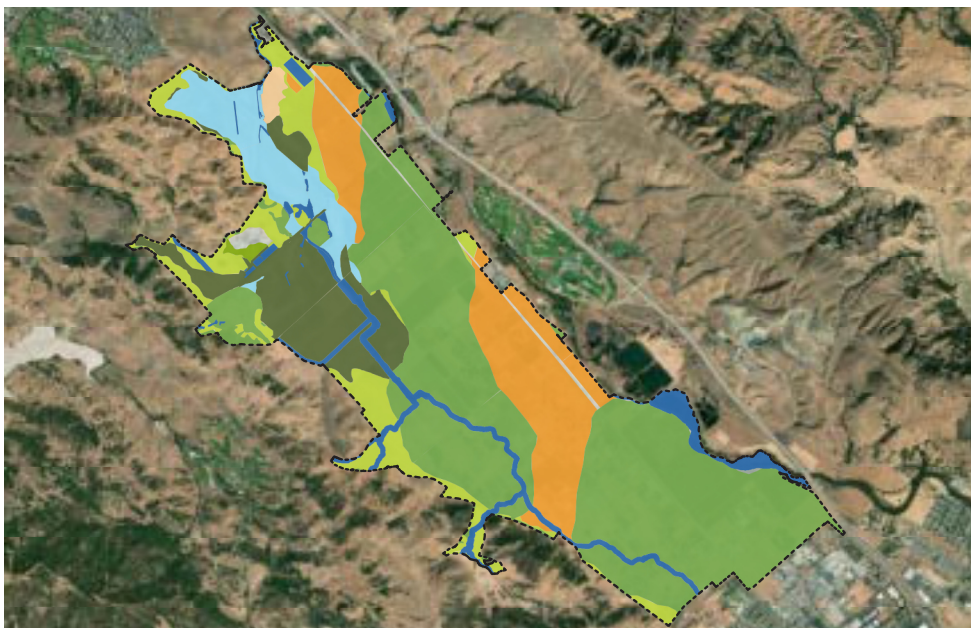
Carbon Farming

Home to some of the highest quality cropland remaining in the City, the future of Coyote Valley will need to support agriculture. Carbon farming practices for working lands can both improve agricultural productivity and increase sequestration in vegetation and soil.

Historic Ecology

Coyote Valley is home to over 200 acres of riparian landscapes and Laguna Seca wetland, a seasonal lake that will benefit from restorative practices to both improve habitats and significantly increase carbon sequestration. Restoring historical ecology will also support regional wildlife habitat connectivity goals by linking 1 million acres in the Santa Cruz and Diablo Range Mountains.

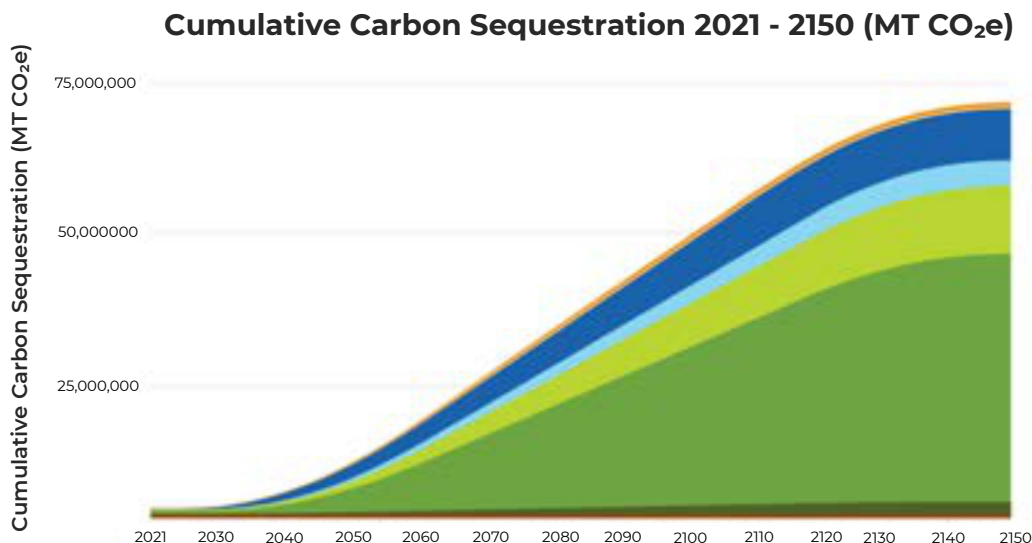
Below: Coyote Valley is a diverse landscape where a variety of NWL management and restoration practices are possible.



Source: Coyote Valley Landscape Linkage Report.

Land Types that have Potential for Restoration

- Orchards
- Willow Grove
- Riparian
- Wetlands
- Oak Savannah
- Oak Woodlands
- Wet Meadows
- Total Below Ground



Above: This graph shows the cumulative results of an illustrative large-scale restoration and carbon farming scenario in Coyote Valley in 2021, sequestering over 70 million metric tons of CO₂ equivalent by 2150¹⁷.



Coyote Valley (Credit: Santa Clara Valley Open Space Authority)

Funding Progress

Funding the actions needed to maximize Coyote Valley's carbon sequestration potential will require innovative solutions and new mechanisms.

Nature-Based Investments

Continued public and private investments through innovative funding programs like San José's Measure T, a \$650M infrastructure bond that included \$50M for land acquisition for the purposes of protecting natural infrastructure in Coyote Valley, are accelerating efforts to implement nature-based solutions at the scale necessary to address climate change.²²

Climate Resilience Credits

San José is currently exploring the potential for a program that would allow property owners in Coyote Valley to receive

credits and compensation for environmental benefits related to conservation and restoration. Developers and public or private organizations could purchase credits in return for California Environmental Quality Act mitigation or voluntary credit, such as to meet corporate sustainability goals.²³

What's Next

The next step in Coyote Valley's rebirth as a well-managed and restored NWL is the development of a long term conservation and restoration plan. The Coyote Valley Conservation Areas Master Plan will engage communities to create a roadmap for the future of Coyote Valley's conserved lands.²⁴ The Plan will be managed by OSA in partnership with POST and the City of San José. As the City and OSA embark on this effort, they will consider the

many users and beneficiaries of conservation and restoration in Coyote Valley.

Indigenous Heritage

Engagement with indigenous communities will seek to empower tribal partners to apply their ecological knowledge and cultural stewardship practices towards the overarching efforts to restore the landscape and strengthen climate resilience.

See
Section 3.1

Climate Justice

The City and its partners recognize that NWLs have a role to play in reversing historical inequities through climate justice. Potential investments in Coyote Valley will be considered from a range of perspectives and a diverse group of stakeholders will be involved in the planning process.

See
Section 3.1

05 Getting it Done

5.1 Future Actions & Policies - *Page 56*

5.2 Funding Mechanisms - *Page 59*

5.3 What's Next for NWLs – *Page 60*

5.4 Conclusion – *Page 61*

Future Actions & Policies

Transforming our vision for 2050 into reality requires a wide variety of stakeholders to take action

Vision

As the City plans for growth, San José will plan to minimize the loss of City-designated NWLs and aim to increase the carbon sequestration potential of City-designated NWLs.

The City will do this by designating additional lands within the City's sphere of influence (SOI) as NWLs. The City and its partners will enable regenerative agriculture practices on croplands and grazing lands as well as restoration and enhancement activities on natural lands and urban greenspace. Finally, the City will strive to add new neighborhood parks within safe and convenient walking distance of all San José residents.

Paris-Related Indicators

Carbon dioxide equivalents sequestered annually by this strategy:

2030: **62,400 MT CO₂e**
 2040: **220,300 MT CO₂e**
 2050: **381,500 MT CO₂e**

Related Measures

Cumulative cost per MT CO₂e sequestered (2021 - 2050):

Oak Woodland Restoration: **\$8/MT CO₂e**
 Compost Application: **\$16/MT CO₂e**
 Grazing Lands Management: **\$59/MT CO₂e**
 Native Grassland Restoration: **\$94/MT CO₂e**
 Biosolids Application: **\$133/MT CO₂e**
 Riparian Restoration: **\$159/MT CO₂e**
 Mulching Application: **\$211/MT CO₂e**
 Cropland Management: **\$308/MT CO₂e**
 Street Tree Planting: **\$975/MT CO₂e**
 Wetland Restoration: **\$1,101/MT CO₂e**
 Urban Forest Expansion: **\$1,288/MT CO₂e**

KEY

CMO: City Manager's Office

DOT: Department of Transportation

ESD: Environmental Services Departments

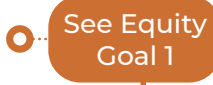

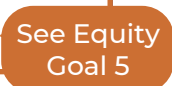
OED: Office of Economic Development




PRNS: Parks, Recreation and Neighborhood Services

PBCE: Planning, Building and Code Enforcement

The following list of actions offers ways for the City to support the implementation of NWL strategies. However, external efforts and interagency partnerships and collaboration will be key to successfully implementing NWL strategies.

Table 5: Options for Supporting City Actions

FOCUS AREA	OPTIONS FOR SUPPORTING CITY ACTIONS	LEAD
NWL PRESERVATION & EXPANSION	Evaluate City-owned lands for their opportunity to become City Designated NWLs, particularly if redesignation benefits historically marginalized communities.	PBCE 
	Consider opportunities to allow higher densities in transit oriented infill locations as highlighted through the Urban Village planning process, the Housing Element, and the Housing Crisis work plan during the next General Plan 4-year review process.	PBCE
	Consider opportunities to establish development buffers that maintain the functionality of NWLs and expand NWL General Plan designations during the General Plan 4-year review process, especially in high VMT areas.	PBCE
	Explore incentivizing climate smart land management through transportation infrastructure funding programs.	DOT
	Consider placing deed restrictions or open space easements on high value NWLs to ensure permanent protection of these lands.	PBCE
	Evaluate targeted buy-outs of properties in hazard areas, such as flood- or fire-risk areas, and properties suitable for restoration activities.	OED
	Update parking policies to reduce minimum requirements and support denser development.	PBCE, DOT
REGENERATIVE AGRICULTURE	Participate in the County of Santa Clara's and the Guadalupe Resource Conservation District's carbon sequestration efforts for land designated as Agriculture.	ESD
	Support efforts to identify potential funding mechanisms modeled after the CalCan technical assistance program to assist the operations of socially disadvantaged farmers and ranchers in the San José region.	ESD  
	Support County efforts that facilitate the permitting of and/or increase the area for biosolids land application.	ESD
	Evaluate whether City compost procurement to meet SB 1383 requirements could help support compost application on NWLs in the City sphere of influence.	ESD

FOCUS AREA	OPTIONS FOR SUPPORTING CITY ACTIONS	LEAD DEPARTMENTS
NWL RESTORATION & ENHANCEMENT	Pursue grant funding for applying restoration practices on City-owned lands.	ESD
	Support efforts to identify private and public lands in very high priority areas, as identified by the Trust for Public Lands, where restoration practices can be applied.	PBCE 
	Support Fellows, community-based organizations and special district collaboration, programs, and incentives for restoration activities on private and public lands.	PRNS, ESD
	Coordinate with Valley Water to promote incentives for replacing lawns and installing water-efficient landscapes.	ESD
	Explore opportunities to partner with California Indigenous tribes to accelerate nature-based climate solutions.	ESD 
	Explore agriculture land preservation incentives for private land owners (tax abatements, i.e. Williamson act, farmland security zone, open space easements).	CMO
URBAN GREENING	Prioritize urban greening and park restoration/enhancement projects in areas with high Urban Heat Island Index.	PRNS 
	Partner with local nurseries to develop a broader variety of tree/plant species that are climate smart, noninvasive and /or native to the San José region.	DOT
	Integrate carbon management practices, such as mulching and composting, into policies for management of City parks and landscaping.	PRNS
CARBON TRACKING & MANAGEMENT	Support the use of remote canopy data to monitor tree canopy changes.	DOT
	Support the development and analysis of statewide NWL data sets.	ESD
	Support regional studies that analyze and identify measures to mitigate impacts of climate change on natural resource resiliency.	ESD
	Continue to explore the concept of a Climate Resilience Credits program in partnership with the Santa Clara Valley Open Space Authority.	PBCE

Funding Mechanisms

Novel options for funding preservation and enhancement of NWLS

Implementing actions that support NWL goals and strategies will require a level of financial commitment from the City. To help with the annual costs of implementation, there are a range of funding options available to the City for either its own use or to enable use by others in San José, such as residents, the private sector, developers and others. These are explored below.

FUNDING MECHANISM	DESCRIPTION	OPPORTUNITY
GRANTS	Cities, landowners, and private sector actors can apply for grants to acquire, restore, or enhance NWLS and public agency grants to launch pilot and demonstration NWL projects.	Grant-focused community engagement can improve access to funding for innovative programs.
GENERAL OBLIGATION BONDS	Cities, counties and regions commonly issue voter-approved bonds to investors with the promise to repay with a level of certainty over a certain time period and with a certain return.	Bonds unlock immediate capital that can fund a wide variety of NWL preservation, restoration and urban greening projects.
CARBON TAX	Taxing the production of carbon-based energy and using the proceeds as a dividend or rebate to residents and taxpayers. Requires voter approval by two-thirds margin if tax revenues are limited to use on sustainable projects.	Seek to reduce emissions. Funds and proceeds can be directed toward the City, residents, or other organizations to fund NWL restoration efforts.
CAP & TRADE	Determine a maximum amount of acceptable emissions from many sources in the production or use of carbon and let the market determine the price for being under or over the assigned emission level.	Seek to reduce emission and fossil fuel usages. Funds and proceeds can be directed toward the City, residents, or other organizations to fund NWL restoration efforts.
COLLABORATIVE PROJECTS	Develop relationships with other agencies, non-profits, and private actors.	Increased funding can be obtained by collaborating with other public agencies and community groups.

Table 6: Available Funding Mechanisms

What's Next for NWLs

Climate Smart San José recommended the further study of NWLs and the creation of an NWL Element. Here's how we can apply what we learned to other City initiatives

Envision San José General Plan

The current General Plan was adopted in 2011 and the most recent 4-year review was completed in 2022. While several policies favorable to NWLs were adopted, such as the redesignation of Northern Coyote Valley, there is still more work to be done. Future updates to the General Plan will provide an opportunity to apply new knowledge and strategies developed since the last update.

2026 - 2030 Capital Improvement Program

San José's 5-year Capital Improvement Program (CIP) identifies infrastructure projects that will be funded and built within the budgeting timeframe. The next CIP budgeting cycle will be 2026 - 2030 and could provide an opportunity to identify infrastructure improvements that could support, conserve, or improve NWLs.

Climate Smart San José

Climate Smart San José is the City's Climate Action Plan. The next iteration of this plan will contain a wealth of new information and recommendations to continue moving San José toward its emissions reduction goals.

The analysis and findings contained within the NWL Element will be integrated into a future update of Climate Smart. Specifically, the following components should be added to address NWLs:

Climate Smart Strategies

Climate Smart San José contains nine "Climate and Water Strategies". With the completion of the NWL Element, a tenth strategy should be added to address conservation, restoration, and enhancement of San José's NWLs.

Community Playbooks

Climate Smart's "Community Playbooks" focus on actions

that various non-city actors can undertake to implement the plan. To better address actions that land owners and stewards can undertake, each playbook should be evaluated to see whether there are any relevant NWL strategies it should include.

City Action Plan

The City Action Plan section of Climate Smart lays out costs and implementation measures to reach Climate Smart progress milestones. An NWL-specific section of the City Action Plan should be added, similar to section 4 of this document.

Equity Considerations

Equity-focused goals are a key part of this NWL Element, but they are not included in the current Climate Smart plan. The next version of Climate Smart will need to evaluate Climate and Water Strategies with an equity lens.

Conclusion

Protecting NWLs can help San José to meet its climate goals while still achieving a growing economy and equitable outcomes for its communities

Our Natural and Working Lands Matter

The findings in this document show that NWLs are an important part of San José's GHG reduction strategy. Healthy NWLs can sequester carbon and provide significant opportunities to reduce GHG emissions.

The ability for these NWLs to sequester carbon into the future will depend on the choices made today. In order to leverage the full sequestration potential of NWLs, policy decisions will need to incorporate the preservation, expansion, and enhancement of NWLs.

NWLs also provide a suite of positive environmental, community and financial benefits that are commonly known as co-benefits. Studies have shown that the implementation of climate policies targeting GHG reductions through NWL preservation, expansion, and

enhancement can also lead to cost savings, improved community health, cleaner air, native habitat preservation and an overall healthier ecosystem.

A Plan For the Future of Our NWLs

With guidance from San José's climate action plan, Climate Smart San José, along with other important local, regional, and state planning efforts, San José's NWLs will be protected and enhanced to maximize carbon sequestration, while providing a range of co-benefits.

Loss of NWLs will be minimized through thoughtful land use policy that promotes compact development, while disincentivizing greenfield development. Finally, the amount of NWLs within the City's SOI will grow as the City and its partners bring land into permanent protection.

To maximize the carbon sequestration potential of

NWLs, carbon sequestration strategies will be applied to viable NWL lands. These strategies involve managing the use and development (in both urban and rural settings) of NWL resources and may include agricultural practices, reforestation, management of urban greenspace, or restoration of existing degraded NWLs.

Given the urgency of climate change and potential scale of climate change impacts, the City of San José recognizes that it will need to consider diverse and bold measures to counteract its GHG emissions.

The vision, strategies, and actions laid out in this document will help guide the City and its partners to make the bold moves needed to meet the City's ambitious climate goals for a better tomorrow.

Works Cited

- [1] “What is Carbon Sequestration and How Does it Work?,” University of California Davis, Clarity and Leadership for Environmental Awareness and Research at UC Davis, accessed December 22nd, 2021. <https://clear.ucdavis.edu/explainers/what-carbon-sequestration#:~:text=Carbon%20sequestration%20is%20the%20process,cause%20the%20atmosphere%20to%20warm>.
- [2] City of San José. Natural and Working Lands Technical Report. 2021. City of San José. <https://www.sanjoseca.gov/home/showpublisheddocument/78097/637692077302400000>.
- [3] General Plan Four-Year Review (GP21-012). 2021. Appendix C: Air Quality and GHG Emissions Assessment, City of San José (sanjoseca.gov). Accessed January 14th, 2022. <https://www.sanjoseca.gov/home/showpublisheddocument/78601/63769912411600000>.
- [4] Greenhouse Gas Equivalencies Calculator. 2021. United States Environmental Protection Agency. <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.
- [5] National Land Cover Database. 2019. <https://www.mrlc.gov/data/nlcd-2019-land-cover-conus>
- [6] “Carbon Sequestration,” United States Department of Agriculture Forest Service, accessed December 22nd, 2021. <https://www.fs.fed.us/ecosystemservices/carbon.shtml>.
- [7] “Governor Newsom Launches Innovative Strategies to Use California Land to Fight Climate Change, Conserve Biodiversity and Boost Climate Resilience,” Office of Governor Gavin Newsom, accessed December 22nd, 2021. <https://www.gov.ca.gov/2020/10/07/governor-newsom-launches-innovative-strategies-to-use-california-land-to-fight-climate-change-protect-biodiversity-and-boost-climate-resilience/>.
- [8] “California Air Resources Board Natural and Working Lands Scoping Plan Draft Alternative Scenarios” California Air Resources Board, 2021. <https://ww2.arb.ca.gov/sites/default/files/2021-12/NWLScenariosForPublicDistribution.pdf>
- [9] “Santa Clara Valley Open Space Authority, California, Measure T, Parcel Tax (November 2020),” BallotPedia, accessed December 22nd, 2021. [https://ballotpedia.org/Santa_Clara_Valley_Open_Space_Authority_California_Measure_T_Parcel_Tax_\(November_2020\)](https://ballotpedia.org/Santa_Clara_Valley_Open_Space_Authority_California_Measure_T_Parcel_Tax_(November_2020)).
- [10] “Climate Smart San José,” Climate Action Plan, City of San José, adopted 2018, accessed December 22, 2021. <https://www.sanjoseca.gov/home/showpublisheddocument/32171/636705720690400000>.

- [11] "Health Co-Benefits of Climate Action," Health and Climate Change Toolkit, World Health Organization, accessed December 22, 2021. <https://www.who.int/activities/building-capacity-on-climate-change-human-health/toolkit/cobenefits>.
- [12] City of San José. Natural and Working Lands Technical Report. 2021. City of San José. <https://www.sanjoseca.gov/home/showpublisheddocument/78097/637692077302400000>.
- [13] Greenhouse Gas Equivalencies Calculator. 2021. United States Environmental Protection Agency. <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>.
- [14] City of San José. Natural and Working Lands Technical Report. 2021. City of San José. <https://www.sanjoseca.gov/home/showpublisheddocument/78097/637692077302400000>.
- [15] Based on UrbanFootprint Conservation Module.
- [16] Williamson Act and Open Space Easement. County of Santa Clara. Accessed April 20th, 2022. <https://plandev.sccgov.org/policies-programs/williamson-act-and-open-space-easement>.
- [17] Based on UrbanFootprint Case Study. https://www.openspaceauthority.org/system/documents/Coyote%20Valley%20Landscape%20Linkage%20Report_Final_lowres.pdf.
- [18] & [19] "Defining Vulnerable Communities in the Context of Climate Adaptation" Governor's Office of Planning and Research, July 2018, accessed April 20, 2022. https://opr.ca.gov/docs/20180723-Vulnerable_Communities.pdf
- [20] "Coyote Valley Landscape Linkage Report," Santa Clara Open Space Authority, December 2017, accessed December 23rd, 2021. <https://urbanfootprint.com/saving-coyote-valley-san-jose/>
- [21] Based on UrbanFootprint Case Study. <https://urbanfootprint.com/saving-coyote-valley-san-jose/>
- [22] & [23] "Nature-Based Solutions for a Climate Smart Future," brochure, Santa Clara Valley Open Space Authority, 2021. Accessed December 22nd, 2021. <https://www.openspaceauthority.org/system/documents/NatureBasedSolutionsForAClimateSmartFutureBrochure.pdf>.
- [24] "Coyote Valley Conservation Areas Master Plan," Santa Clara Open Space Authority, Draft plan 2021, accessed December 22nd, 2021. <https://www.openspaceauthority.org/our-work/planning-coyote-valley.html>

06 Appendices

Appendix A Strategy Cost Assumptions

Appendix B NWL Technical Report and Appendices

Appendix A: Strategy Cost Assumptions

Note that cost assumptions are based on the best data available. To compare strategy costs, all strategy cost estimates (with the exception of street tree planting) are normalized on a per acre basis. For this reason, flat fees associated with strategies are not included in the estimate but are noted in the limitations.

STRATEGIES	INITIAL COSTS	ANNUAL COSTS	SOURCE	LIMITATIONS
Cropland Management	-	\$43 / acre	2021 Healthy Soils Program Incentives Program, Office of Environmental Farming and Innovation, California Department of Food and Agriculture	Estimate is an average annual cost of multiple cropland management substrategies. Those include cover crops, strip cropping, conventional till to reduced tillage and no till, and conservation crop rotation. Note that this estimate does not include land lease costs.
Grazing Land Management	\$285 / acre	\$44 / acre	2021 Healthy Soils Program Incentives Program, Office of Environmental Farming and Innovation, California Department of Food and Agriculture	The initial cost estimate is an average of multiple grazing land management substrategies cost estimates. Those include prescribed grazing, range planting, and silvopasture establishment. The annual cost is derived from an estimate provided by the Open Space Authority to cover reoccurring fencing maintenance costs. Note that this estimate does not include land lease costs.
Biosolids Application	-	\$139 / acre	San José Environmental Services 2019 Market Assessment (see item 6A)	Estimate is highly dependent on the ton per acre application rate, determined by the level of nitrogen in biosolids, and can range from \$140 to \$695 per acre. Estimate stated represents the midpoint of range. Note that the estimate does not consider the cost of transporting biosolids to the location for application, which can increase the cost significantly.
Mulching Application	-	\$50 / acre	Cost and benefits of mechanical straw mulch application to irrigation furrows, Oregon State University, 2001	Estimate is an average derived from an out of state and outdated source and is highly dependent on the ton per acre application rate. Estimate assumes mulch application to agricultural lands only using a rented mechanical mulcher. Mulch application to urban landscaping might require applying mulch by hand, which can increase the cost significantly.

Compost Application	-	\$275 / acre	San José Environmental Services 2019 Market Assessment (see item 6A) (providing cost / ton of compost multiplied by ton of compost per acre application rate).	The estimate is based on biosolids-containing compost. Estimates are highly dependent on the ton per acre application rate and the type of crop and soil quality of land cover on which compost is being applied. As a result, estimates can range from \$50 to \$500 per acre for application only. Estimate stated represents the midpoint of range. Note that some crops, especially orchards, require special equipment for compost application (ie. subsoiler machine, compost spreader) and may require compost be delivered to the site. Estimate does not include equipment and delivery costs that can amount to an additional \$5,000 to \$20,000 flat fee.
Urban Forest Expansion	\$46,500 / acre	\$2,640 / acre	San José Department of Transportation, Community Forest Management Plan, 2021	Estimate assumes \$775 / tree for planting, \$44 / tree for annual maintenance and a tree planting rate of 60 trees per acre. The tree planting rate assumption may be too dense for San José and will need to be reduced to a recommended 6 - 15 trees per acre in future estimate analyses.
Street Tree Planting	\$775 / tree	\$44 / tree	San José Department of Transportation, Community Forest Management Plan, 2021	-
Native Grassland Restoration	\$2,000 / acre	-	Restoration Manual for Annual Grassland Systems in California, University of California Agriculture and Natural Resources, 2017	Estimate is derived from an outdated source. Estimates are highly dependent on the characteristics of the restoration site and different types and intensity of restoration activities. Estimates can range from \$1,000 to \$3,000 per acre. Estimate stated represents the midpoint of range.
Oak Woodland Restoration	\$12,427 / acre	-	El Dorado County Oak Resources In-Lieu Fees Nexus Study, 2016	Estimate is derived from an outdated source. Estimates are highly dependent on the characteristics of the restoration site and different types and intensity of restoration activities. Estimates can range from \$8,285 to \$16,570 per acre. Estimate stated represents the midpoint of range.
Wetland Restoration	\$365,000 / acre	-	Santa Clara Valley Habitat Agency Fee Schedule, 2021 - 2022	Estimate is derived from an impact fee schedule for wetland mitigation. Estimates are highly dependent on the characteristics of the restoration site and different types and intensity of restoration activities. Estimates can range from \$250,000 to \$480,000 per acre. Estimate stated represents the midpoint of range.
Riparian Restoration	\$209,000 / acre	-	Santa Clara Valley Habitat Agency Fee Schedule, 2021 - 2022	Estimate is derived from an impact fee schedule for wetland mitigation. Estimates are highly dependent on the characteristics of the restoration site and different types and intensity of restoration activities.



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