
Wildflowers on Bair Island

Natural Resources

Natural resources are all around us, whether it is the water running from our faucets or flowing through Redwood Creek, the natural habitat where animals and birds forage for food, or the tall trees that shade our streets and cools us as we walk through a park. These resources contribute tremendously to the quality of life in Redwood City and allow residents to enjoy and experience features not found in many urban environments. We must take care as most natural resources are not replenishable. This Element focuses on preserving, protecting, conserving, re-using, and efficiently using Redwood City's natural resources.

Introduction

Natural resources are the lands, minerals and fossil fuels, wildlife, plants and trees, air, water, groundwater, drinking water, and other resources obtained from the Earth. Some resources are managed, such as trees growing in a park or drinking water that is transferred via pipelines from sources miles away. Other resources are meant to flourish through conservation, such as marine wildlife or the wetland grasses that thrive on Bair, Bird, and Greco Islands. Some resources are processed far away to generate fuel to power our cars and homes. These resources share a common theme: they are meant to be conserved and protected, so that future generations of Redwood City residents can continue enjoy the high quality of life we know today.

Natural Resource Chapters:

Water Resources
- Water Supply
- Water Conservation
- Recycled Water
- Water Demand

Energy Conservation
- Renewable Energy Use
- Light Pollution

Natural Habitat and Open Space
- Surface Waters
- Bay Wetlands and Eco-Systems
- Hillside Open Space

Urban Forest

Related Plans and Programs

A variety of regional governmental agencies have been established to regulate natural resource issues that extend beyond the boundaries of individual cities.

Urban Water Management Planning Act

The California Urban Water Management Planning Act requires all large-scale urban water suppliers to prepare an Urban Water Management Plan (UWMP). The Act requires that the UWMP be revised and updated every five years. Redwood City owns and operates a water utility, and is therefore required to compete an UWMP.

The UWMP is required to describe and evaluate existing and potential water supply sources, project future population growth and water demand, describe water demand management measures, and provide strategies for responding to water shortages and emergency water interruptions. Although the 2005 update to the UWMP served to capture increasing local public interest and community values about water supply cost and reliability, the UWMP does not specifically include “goals or policies” related to the topics covered by the UWMP. The goals, policies, and implementation programs set forth in this Element are intended to guide City staff, decision makers, and residents and businesses in the management of this essential resource.

National Pollutant Discharge Elimination System

As authorized by the U.S. Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating pollutant discharges into the waters of the United States. To monitor the NPDES permit program, the Clean Air Act

authorized State Water Quality Control Boards and related regional offices such as the San Francisco Bay Regional Water Quality Control Board. The regional offices set up programs that implement NPDES goals. Under the NPDES Stormwater Permit issued to the County of San Mateo and Redwood City as co-permittees, most new development projects in the city are required to incorporate measures to minimize pollutant levels in stormwater runoff. Compliance is required at the time that construction permits are issued, and over the long term, periodic inspections are completed to verify continued compliance. The Public Works Services Department enforces NPDES requirements in Redwood City.

In addition to these two laws, the following acts play a significant role in natural resources policy:

- Endangered Species Act
- California Environmental Quality Act
- National Environmental Policy Act
- Global Warming Solutions Act of 2006 (AB 32)

Natural Resources Vision - 2030

Redwood City residents and visitors value our parks, open spaces, wildlife habitat, recreational trails, water resources, and beautiful urban forest for their intrinsic values. We respect our natural resources, and makes conscientious efforts to preserve these valuable resources for future generations. Redwood City works to preserve and protect existing resources and, as appropriate, works to capture new resources as they become available.

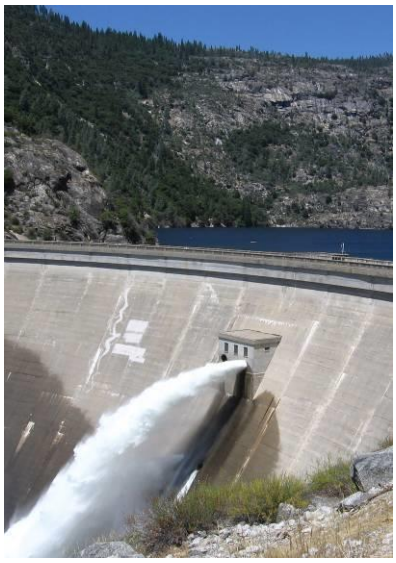
Redwood City is committed to combat global climate change through energy conservation in all segments of the community. Redwood City is a leader in water conservation and re-use.

Redwood City has ample parks, trails, scenic resources, and wildlife habitat areas, which provide recreational and ecological benefits as well as a source of aesthetic pleasure. To support the ecological benefits provided by these areas, Redwood City protects and maintains natural open spaces and habitat areas, including creeks and streams, marine habitats, grasslands, and forests.

Redwood City values our walkable and bike-friendly streets, with street trees dominating the edges. Our urban forest provides many benefits, and

we are committed to sustaining a beautiful, healthy, and safe urban forest.

Redwood City takes pride in our appearance and beauty. We value our levees and waterways, and support clean-up efforts to eliminate graffiti and litter. Redwood City strives to be an immaculate city.



Hetch Hetchy Reservoir and O'Shaughnessy Dam

Water Resources

Water is a valuable resource that we depend on for our basic needs such as drinking, cooking, and hygiene. Water is also used for irrigation and commercial and industrial businesses' production and services. As a community grows, additional water is often needed to meet the growing demand. An insufficient water supply can stunt local housing and economic development. This Water Resources Chapter examines Redwood City's water supply and demand, conservation efforts, and the importance of planning to effectively use our limited water supply.

Water Supply

Redwood City receives its water from two sources: potable (drinkable) water from the Hetch Hetchy regional water system, and recycled water from the South Bayside System Authority sub-regional wastewater treatment plant.

Potable Water

Redwood City receives most of its potable water from the Hetch Hetchy regional water system. The regional water system is run by the San Francisco Public Utilities Commission (SFPUC). The system gathers water from Sierra Nevada rainfall/snow pack, and supplements that water with treated water from water supplies in Alameda and San Mateo Counties. The water is then delivered to Redwood City through the regional system pipelines. From the pipelines, the water is dispersed through Redwood City's storage and distribution system to local users.

See the Built Environment Element, Infrastructure Chapter, for more water distribution information.

While the city's potable water supply is fairly stable, the amount of available water is largely dependent on rainfall and snow pack. Thus, drought conditions can limit water supply. Furthermore, water supply could potentially be restricted as a result of a major earthquake, as the regional water system supply lines cross several active faults, including the San Andreas Fault. SFPUC has an extensive Emergency Drinking Water Plan in place to immediately respond in the event of an emergency and provide critical drinking water to the city if local water service is ever disrupted.

Redwood City, and the other wholesale customers obtaining water from the SFPUC, belongs to the Bay Area Water Supply and Conservation Agency (BAWSCA). BAWSCA represents the interests of its members to ensure that the regional water supply system meets its customers' needs

in a reliable, affordable, and environmentally sustainable manner. BAWSCA has authority to coordinate water conservation, supply, and recycling programs carried out by the individual water agencies it represents. BAWSCA also has authority to acquire water and make it available to other water agencies on a wholesale basis, to finance projects, and to build facilities.

A water supply contract ("Water Supply Agreement") between Redwood City and the County of San Francisco and wholesale customers in Alameda County, San Mateo County, and Santa Clara took effect in July 2009. It has a 25-year term with provisions for two five-year extensions. The Water Supply Agreement addresses wholesale water rates, water supply, and shortages. Under the terms of the Water Supply Agreement, SFPUC's contractual supply obligation to Redwood City is 10.93 million gallons per day on an annual average basis (12,243 acre-feet per year). Since 1999, the city has exceeded its annual allocation of water supply by an average of 800 acre-feet per year. To make up for this shortfall, Redwood City has purchased surplus water from SFPUC. These purchases may only occur during periods of "normal" water supply and if other water purchasers are not using their full allocation. This arrangement is not considered a long-term solution, given a finite regional water supply and expected future increases in water demand from other customers. The cost of SFPUC water has begun to rise, and is projected to nearly triple in cost by 2015. Recognizing that this cost increase is an incentive to further reduce water consumption, the Redwood City Council adopted a goal of eliminating its water supply deficit, as explained in the following discussion.

The average person in the Bay Area uses about 60 gallons of water per day, or 0.0672 acre feet of water per year.

Other Potable Water Supply Sources

In order to augment its water, Redwood City has considered other possible water sources including inter-agency water transfers and exchanges, groundwater, and desalination. In addition, the City has initiated a variety of water conservation measures as well as a recycled water system.

Water Transfers and Exchanges

Within the SFPUC system, water entitlements and/or unused portions of water allocations may be transferred or exchanged between contracting agencies. Additionally, State laws allow for 'wheeling' water between sellers and buyers through water transmission systems owned by third parties. Under this arrangement, water could be purchased by SFPUC from other water suppliers. This is a more complex process requiring a contract and an agreement between willing water suppliers and the

Wheeling is the transfer of water between willing sellers and buyers. Voluntary water transfers provide an important water resource management tool by fostering efficient allocation of water resources.

SFPUC. Besides the quantity and price of water to be agreed upon, the agencies must also address water quality and operational terms. BAWSCA has statutory authority to assist its member agencies to plan for and obtain additional water supplies, and may be able to facilitate water transfer and exchange opportunities.

Groundwater

Historically, groundwater has not been considered a viable source of potable water for Redwood City due to concerns about water quality, reliability, and the local aquifer's limited long-term production capacity. Local groundwater is currently used by a small number of private well owners for domestic and irrigation uses. For example, Sequoia High School uses groundwater for landscape irrigation. The City and the Sequoia Union School District work together to ensure that the District is optimizing its water use in accordance with City water conservation guidelines. Other groundwater sources within the city are privately owned. City staff is also exploring the feasibility of using groundwater for City park and facility irrigation.

Effects of climate change such as sea level rise are addressed in the Public Safety Element, Atmosphere and Climate Chapter.

Although the aquifers beneath Redwood City may not be a reliable municipal water supply source now, they may be able to provide small amounts of supplemental non-potable water to help contribute to the city's total water supply. As such, it is important to ensure that groundwater supplies are carefully managed and recharged, so that they can continue to be a source of water for irrigation and other uses. In addition, groundwater recharge through permeable surfaces is important because when groundwater is depleted, it can cause subsidence. Subsidence is the motion of surface lands downward relative to sea level.

Desalination

Desalination is the process of obtaining fresh water from brackish or sea water by removing salt and other minerals. Desalination is used throughout the world where fresh water is in limited supply. Desalination has not been widespread in California due to high energy costs and environmental concerns. The Bay Area Regional Desalination Project is a joint effort of the SFPUC and three other regional water agencies in the San Francisco Bay Area. The Desalination Project studies the feasibility of developing regional desalination facilities. Just one or two desalination plants could conceivably supply the Bay Area with 150 million gallons of water per day. However, siting and funding desalination plants present many regulatory and technical challenges, requiring a long-term commitment to bring desalination to realization. Although not considered a near-term supply option for Redwood City, the City continues to watch the progress of the Desalination Project.

Water Conservation

In 2009, California is in its third consecutive year of drought, and the Governor has declared a state of emergency. Paleoclimatologists note that drought has been the norm, rather than the exception, since the beginning of the new century. As such, it is crucial that we carefully plan for our water resources, and provide an adequate and sustainable water supply to serve the needs of Redwood City water users. To meet this goal, reduced water consumption through aggressive implementation of conservation policies and programs will continue to be extremely important.

Water conservation represents a cost-effective and environmentally sound way to reduce current and future water demand. Residents and business owners can take many actions to reduce water use, such as using water-conserving fixtures and appliances, fixing leaks, planting drought-tolerant landscaping, and avoiding unnecessary water use.

Redwood City has been, and continues to be, a leading advocate for water conservation. The City's Water Allocation Program provides detailed water use information online and on customers' water bills. The program determines the amount of water each customer needs under normal conditions to maintain their household or landscape. During a drought, water allocation reductions will be based on the specific needs of individual water users.

The wholesale water agencies served by the SFPUC implement a series of local water conservation programs in response to water shortages during droughts. These programs have generally been successful in reducing water use so that the overall rate of water consumption has increased at a slower rate than the increase in population. An essential part of water conservation is understanding and accounting for water usage. Redwood City regularly analyzes its customers' water use to determine the most effective and appropriate water conservation measures.

Water conservation can be classified into two types: passive and active conservation.

Redwood City Water Conservation Programs:

- High Efficiency Clothes Washer and Toilet Rebate Program
- Large Landscape Conservation Program
- Water Conservation Education Program
- SMART Home Water Use House Call Program
- SMART Home Water Conservation Kit
- Water Use Allocation Program

Passive Water Conservation

Passive water conservation occurs through compliance with State and federal laws mandating the sale of certain high-efficiency fixtures and appliances. For example, State and federal laws have mandated that only high-efficiency toilets could be sold as of 1992, and only high-efficiency clothes washers be sold starting in 2007. This is considered passive conservation, since consumers have no choice but to buy the high-efficiency models. Flushing toilets and washing clothes account for about half of the total residential indoor water use. As more high-efficiency toilets and clothes washers are installed, the result will be a gradual and growing passive water savings.

Active Water Conservation

Active water conservation involves the implementation of proactive programs. Active conservation efforts include providing incentives and rebates for low-flow toilets and water-efficient washing machines that are even more efficient than those required by federal and State laws, distributing water conserving faucets and shower heads, providing toilet tank leak detection tablets, providing information on water-efficient landscape irrigation methods, and other education and outreach programs. Redwood City actively implements relevant water conservation programs.

Recycled Water

Redwood City's recycled water facilities are discussed in the Built Environment Element, Infrastructure Chapter.

Redwood City has developed a recycled water system, including a recycled water treatment facility and a series of distribution pipelines. Within this General Plan's timeframe, it is anticipated that the recycled water system will provide nearly 2,000 acre feet per year of water to Redwood City customers. For additional information regarding Redwood City's recycled water system, please refer to the Infrastructure Chapter of the Built Environment Element.

Water Demand

Redwood City's water customers, all of which are metered, are classified into six basic categories:

- Single-Unit Residential: Attached or detached dwelling units that are individually metered
- Multiple-Unit Residential: Two or more dwelling units served by a common water meter
- Commercial: All commercial, industrial, and institutional customers

- Irrigation Commercial: Water meters used exclusively for outdoor uses by commercial customers
- Irrigation Residential: Water meters used exclusively for outdoor uses associated with residential customers. Almost all of these meters serve Homeowner Associations
- Other: This includes fire service meters, schools, churches and City of Redwood City non-irrigation meters

Residential water use has been and continues to represent the largest percentage of total water use in the city. As a high percentage of residential water use is used for landscape irrigation, residential water use is higher during the summer months.

Determining future water demand is an ongoing process. Redwood City's 2005 Urban Water Management Plan (UWMP) includes water demand projections for a 25-year period from 2005 to 2030. The projections are primarily based on population and demographic data and assumptions about customer types. The 2005 UWMP assumed that increases in Redwood City housing stock would mostly be high-density multi-unit developments concentrated in and around the Downtown area and along major transit corridors (consistent with this General Plan's Urban Form and Land Use Chapter policy). As such, new multi-unit residential development is projected to result in the largest increase in water use in the city. Commercial water use is expected to increase at a slower rate, due to recent declines in employment and high office vacancy rates.

Redwood City works closely with the SFPUC and BAWSCA to continually refine water demand projections. The population and demographic data used in the 2005 UWMP water supply and demand projections was coordinated with Redwood City Community Development and the General Plan update process. The Urban Form and Land Use Chapter of the Built Environment Element focuses new growth and population increases in infill areas such as Downtown and along major corridors.

In addition to analyzing population and demographic data, assumptions about water use must also include information on water conservation and recycling efforts. Redwood City has made great strides in water conservation in recent years. In addition to the recycled water system and Recycled Water Use Ordinance, Redwood City has implemented one of the most aggressive water conservation programs in the region, in concert with an active, multimedia public information and outreach effort that includes:

- Continuous newsletter inserts for all City utility bills, featuring six issues per year

- Interactive website, with hundreds of hits recorded
- E-mail broadcasts from consent-based mailing lists
- Regular press releases
- Standing feature articles in local organization newsletters
- Event and meeting newspaper advertising
- On-demand presentations to service organizations; community groups; City boards, committees, and commissions; and educational institutions

Thus, through increased active water conservation efforts coupled with expanded recycled water deliveries, the City plans to remain within its contractual allotment from the regional water system, and also be able to supply water for new residential and commercial development in the city. With the implementation of the recycled water program, anticipated demand for water in 2010 is estimated at over 900 acre-feet per year *less* than the SFPUC allocation.

The General Plan estimates that in 2030, Redwood City (including the Sphere of Influence) will be home to 116,783 people, and a jobs center for 75,866 employees. However, the 2005 UWMP assumes a smaller level of growth. Thus, the General Plan identifies opportunities for more development than can be served under conditions and assumptions outlined in the 2005 UWMP.

The UWMP will be updated again in 2010. With newer types of housing, and dual plumbing required in new construction, as well as lower occupancy rates associated with the new types of housing, the result could be a lower than previously predicted level of water use. In addition, the impact of the City's efforts at conservation and reuse of water have yet to be fully quantified. Additional development in Redwood City beyond that identified in the UWMP could require securing new sources of water; however without thorough research (which will be conducted as part of the 2010 UWMP), exact impacts are yet unknown. Redwood City will explore all components of water supply, demand, and conservation as part of the 2010 UWMP update, and complete monitoring to ensure adequate available water supply.

Land Use and Water Supply Planning

Land use planning intersects with water supply planning throughout the development process. When planners and decision makers review private development projects and City-initiated plans, an understanding of water demand and water availability is critical. Senate Bills 610 (Chapter 643) and Senate Bill 221 (Chapter 642) amended State law in

2002 to improve the link between information on water supply availability and certain land use decisions made by jurisdictions. SB 610 and SB 221 are companion measures that seek to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the jurisdiction's decision-makers prior to approval of specified large-scale development projects. In addition, as a water utility, Redwood City is responsible for preparing Water Supply Assessments for those projects meeting the requirements of the statute. Water Supply Assessments must describe the proposed project's water demand over a 20-year period; identify the sources of water available to meet that demand; and include an assessment of whether or not those water supplies are, or will be, sufficient to meet the demand for water associated with the proposed project, in addition to the demand of existing customers and other planned future development. If a 20-year supply is not demonstrated up front, the water supply assessments should discuss the analysis plans for acquiring additional supplies.

For Redwood City, the "water supplier" for SB 610 purposes is the City's Public Works Services Department, which is responsible for the City's Water Enterprise Fund. The "governing body," as used in SB 610, refers to the City Council, which is required to review water supply assessments and make required findings that adequate water supplies are available for urban growth to proceed.

The UWMP is the primary information and planning tool used to assess water supply adequacy. The UWMP is coordinated closely with Redwood City Community Development policy documents, including the General Plan. To comply with SB 221 and SB 610, the 2010 UWMP update and the City's General Plan will utilize the same assumptions and analyses for assumed development levels and future water supply and demand projections. Future WSAs will rely on the data and information contained in these two documents, and will be updated as necessary.

Key Water Resources Considerations

- Redwood City is highly dependent on imported water for potable uses.
- Water from the regional water system, the city's primary source water supply source, is limited.
- Groundwater extraction is difficult at this time due to water quality, cost, reliability, and limited access to long-term

production capacity. It is possible to explore the use of groundwater as potable water in the future, if these issues are addressed or resolved.

- Desalination is not currently considered a viable water supply option because development of the necessary facilities would be costly, be energy intensive, and generate high volumes of waste. Efforts to develop a viable desalination plant will require regional support and consultation. As new technologies emerge, desalination may become a more viable water source.

- Long-term drought conditions and potential regional emergencies, such as earthquakes, could severely limit water supplies to the city.

Inherent in the Water Resources goals and policies is the importance and impact of the Recycled Water Program on Redwood City's water supply. See the Built Environment Element's Infrastructure Chapter for more information on recycled water.

Water Resources Goals, Policies, and Programs

The following water resources goals, policies, and programs are intended to implement the following General Plan Guiding Principle:

- ***Plan for sustainable open space, water, energy, and air quality within our finite resources***.

Goal NR-1: Ensure that adequate, equitably priced, and sustainable water supplies and associated infrastructure are available to serve the needs of existing and future Redwood City water users.

Policy NR-1.1: Maintain or increase the city's contractual amount of water, consistent with the SFPUC Water Supply Agreement.

Policy NR-1.2: Seek out new sources of potable water for Redwood City. Continue to explore the possibility of developing additional water sources, including the use of groundwater, that are cost-effective and do not result in long-term, unacceptable environmental damage. Where feasible, use the latest water science and consult with the Department of Water Resources and other applicable regional water agencies. Consider using groundwater wells for emergency response purposes.

Policy NR-1.3: Increase general awareness of the importance of water in maintaining a secure, economically vital, and environmentally sustainable community.

Policy NR-1.4: Explore surface water transfers from areas outside of the Bay Area Water Supply and Conservation Agency.

Policy NR-1.5: Sustainability Focus
Explore the potential for transferring recycled water in exchange for potable water with other agencies. Explore the potential for increasing recycled water supply for local use.

Goal NR-2:

Reduce water consumption through aggressive implementation of conservation policies and programs.

Policy NR-2.1: Sustainability Focus
Encourage, facilitate, and/or require the use of water conserving appliances and fixtures in new development.

Policy NR-2.2: Sustainability Focus
Encourage the use of drought-tolerant, low-water consuming landscaping as a means of reducing overall and per capita water demand.

Policy NR-2.3: Sustainability Focus
Continue to develop and implement water conservation programs in response to community input and to keep pace with changing technology.

Policy NR-2.4: Sustainability Focus
Continue to support water conservation programs for existing homes and businesses, including but not limited to water usage monitoring programs, low-flow toilet and plumbing fixture rebates/exchanges, etc.

Goal NR-3:

Coordinate land use and water supply planning processes so that adequate water supplies are available for proposed development.

Policy NR-3.1: Require new development to demonstrate that adequate water is available before project approval and to fund its fair-share costs associated with the provision of water service.

Policy NR-3.2: Maximize public participation in water supply and demand planning.

Policy NR-3.3: Access reliable data and information on water use and supply to thoroughly evaluate the potential water supply impacts and needs of proposed development projects and promote effective decision-making.

Implementation Programs

Procedures, Permits, Agreements, Ordinances

Program NR-1: Sustainability Focus

Water Conservation Programs. Pursue a range of conservation programs and tools, including but not limited to the current California Urban Water Council's "Best Management Practices," such as redesigned water rate structures.

Timeframe: Short Range
Responsible Party: Public Works Services Department
Funding Sources: General Fund

Program NR-2:

Water Usage Monitoring. Continually track actual overall water use in Redwood City and provide an annual report that measures use against a baseline of UWMP demand projections. Create and distribute the report in a manner that promotes public understanding and participation in water management and planning, as well as information for City staff and decision-makers.

Timeframe: Ongoing
Responsible Party: Public Works Services Department
Funding Sources: General Fund

Program NR-3:

UWMP Update. Continue to update the Urban Water Management Plan (UWMP) every five years.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development
Funding Sources: General Fund

Program NR-4:

Transferring Supply Assurances. Encourage developers to work with City staff and BAWSCA to offset new water demand by transferring supply assurances from other agencies to Redwood City. Consult with other water agencies to promote surface water transfers, as necessary.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development

Funding Sources: General Fund, developer fees

Program NR-5: **Water System Fee Requirements**. Review and update ordinances, policies, and other requirements establishing the payment of fees and charges to ensure new development pays its fair share of operating and maintaining the City's water systems, as necessary.

Timeframe: Short Range
Responsible Party: Public Works Services Department; Community Development
Funding Sources: General Fund

Plans and Studies

Program NR-6: **Ongoing Water Studies.** Continue to research the relationship between water supplies, water service, land use, and the growth of the community to best estimate the city's future water supply needs.

Timeframe: Long Range
Responsible Party: Public Works Services Department; Community Development
Funding Sources: General Fund

Special Programs/Projects

Program NR-7: **New Development Water Demand Tracking.** Develop a standardized method to track and analyze water demand and available supply for new developments. Consider expanding the City's application of SB 610 and SB 221 planning requirements to a broader range of projects for monitoring ability. Review the city's total water demand and supply annually to ensure that water supply is available for new development allowed by the Built Environment Element.

Timeframe: Short Range
Responsible Party: Public Works Services Department; Community Development
Funding Sources: General Fund, developer fees

Program NR-8: **Native Landscape/Drought Tolerant Plant Materials.** Encourage and promote the use of native and/or drought tolerant plants in landscaping for existing and new development.

Sustainability Focus

Timeframe: Ongoing
Responsible Party: Community Development; Parks, Recreation and Community Services Department; Public Works Services Department
Funding Sources: New development

Outreach, Education

Program NR-9: **Public Information and Education**.

Sustainability Focus

- Provide periodic information through the City's water utility billings, websites, and local newspapers about water issues, concerns, and programs.
- Provide educational information on the use of, and as appropriate, the hardware for water-conserving technologies such as low-flush toilets, waterless urinals, low-flow showerheads and faucets, and water-wise irrigation, landscaping, and gardening methods, among others.

Timeframe: Ongoing
Responsible Party: Community Development; Public Works Services Department; City Manager Office/Economic Development
Funding Sources: Water Fund and General Fund

Program NR-10: **Citizen Participation in Water Supply Discussions.** Expand opportunities for interested residents and businesses to participate meaningfully in long-term water supply planning decisions.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; City Manager Office/Economic Development; Community Development
Funding Sources: General Fund

Inter-Agency and Other Organizations Consultation

Program NR-11: **BAWSCA Membership and Recycled/Potable Water Transfers.** Maintain Redwood City's membership in and support for BAWSCA. Continue to participate in the institutional dialog regarding regional water supply. Consult with BAWSCA to explore the potential for water transfers of recycled water for potable water.

Timeframe: Ongoing
Responsible Party: Community Development; Public Works Services Department
Funding Sources: General Fund

Program NR-12: **Water Supply Planning.** Consult with the California Department of Water Resources and other regional water agencies such as the Bay Area Water Forum to use the latest water science practices, when feasible. Continue to comply with the water supply planning requirements of SB 610 and SB 221 to ensure adequate water supplies are available to new development.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development
Funding Sources: Developer fees

Energy Conservation

Whether you are driving an automobile or using the computer, you are consuming energy. The energy that keeps our vehicles and appliances running typically requires the burning of fossil fuels or consumption of other natural resources. Recognizing the sources of our energy–particularly those sources that are nonrenewable–and understanding the consequences associated with energy waste will assist in more efficient use of resources.

Redwood City's response to global climate change and efforts to decrease greenhouse gas emissions are discussed in more detail in the Atmosphere and Climate Chapter of the Public Safety Element.

The most commonly-used forms of energy are electricity, petroleum, and natural gas. Most energy resources consumed in Redwood City are processed elsewhere and are then conveyed to Redwood City households and businesses. When energy resources are harnessed through the burning of fossil fuels, greenhouse gases are released into the environment. Energy use (in buildings, transportation, or elsewhere) is the primary source of greenhouse gas emissions in most U.S. cities, including Redwood City. Global climate change is caused by greenhouse gases being released into the atmosphere faster than the Earth's natural systems can reabsorb them.

Both increased renewable energy production and decreased energy consumption through land use policy and energy conservation practices are key components to reducing greenhouse gas emissions, and slowing the Earth's climate change.

Solar-powered parking stations in Redwood City

Renewable Energy Production

Renewable energy production captures energy from natural processes such as sunshine, wind, flowing water, biological processes, and geothermal heat flows and channels that energy to other uses. Neither nuclear power nor fossil fuels such as coal, oil, and natural gas are considered renewable energy sources.

Renewable energy resources may be used directly or used to create other more convenient forms of energy. Examples of direct use are solar ovens, geothermal heating, and water-wheels and windmills. Examples of indirect use that require energy harvesting are electricity generation through wind turbines or photovoltaic cells (solar panels), or production of fuels such as ethanol from biomass.

Utilizing the Sun

Redwood City is fortunate to have abundant sunshine throughout the year. Several buildings in the city have solar panels on their roofs. Although solar panels may require substantial initial investments, they can provide long-term financial benefits.

Solar panels located on the Villa Montgomery residential apartment building on El Camino Real

In addition to solar panels, new and existing development can incorporate other techniques to take advantage of the sun's energy (i.e. passive solar design) and reduce reliance on other, non-renewable energy resources. For example, owners of existing homes can plant deciduous trees for shade in the summer, keeping heat from penetrating the house and lowering cooling costs. When the leaves fall in the winter, direct sunlight can provide natural warmth that reduces heating costs. New developments can orient buildings or windows to minimize or maximize sun exposure for natural lighting and passive heating and cooling. These methods are simple examples of how passive solar design integrates a combination of building features to reduce or even eliminate the need for mechanical cooling and heating and artificial daytime lighting.

Redwood City Verde is a collection of classes, workshops, programs, activities, tools, and ideas for reducing energy and water use in your home, neighborhood, business, and the entire city.

It's all about sustainability and "going green." Redwood City Verde includes programs such as:

- Acterra's Green @ Home residential energy audit program
- Fun "Cool the Earth" activities for students
- Green Business Certification
- Water conservation tools
- "YO - It's Youth Outdoors" kids' nature program

Utilizing the Wind

Wind energy is a source of electricity that is produced when specially designed wind turbines capture the wind to generate electricity. Like historical windmills, modern wind turbines generate power from the wind. New wind turbines are the fastest growing and one of the most cost-effective renewable energy technologies in the world, and are producing power all across the United States. The vast majority of wind power is being produced at large-scale wind farms. However, there is also potential for individual properties or buildings to host wind turbines. For example, areas in Redwood Shores experience consistent afternoon

wind, and roof mounted wind turbines could be explored for interested property owners.

Energy Conservation Practices

California residents and institutions have many years of experience implementing energy conservation efforts. While per capita energy consumption has increased nationally by 50 percent over the past 30 years, per capita consumption in California has not increased over the same period, due to many factors including revisions to laws and efficiency and conservation campaigns by governments, private citizens, and some utility companies.

Redwood City understands the importance of energy conservation by all segments of the community. Energy conservation is imperative to reduce air pollutant and greenhouse gas emissions, and to reduce consumption of nonrenewable natural resources and fossil fuels. Residents, the business community, and institutions can use less energy through simple conservation techniques. Simple energy conservation practices include turning off the lights when leaving a room, or replacing leaky windows to reduce heating and cooling costs and wasted energy.

Land Use/Transportation Policy

One of the most significant ways to conserve energy use is to reduce automobile use and the related vehicle miles traveled (VMT). As a result, Redwood City endorses land use and transportation policies and practices that encourage housing to be located closer to jobs, goods/services, schools, and recreation.

Energy-Intensive Products

Redwood City residents and businesses can also avoid single-use items such as one-use plastic water bottles or styrofoam (especially cups and food containers that could be substituted for paper products or reusable containers). In addition, packaging of products can also be wasteful and unnecessary. These products require extensive amounts of energy to be produced and are not always recycled.

Green Buildings

Buildings dictate or influence everyday human behavior, and they have broad impacts on the environment, the economy, and human health and productivity. “Green building” is the practice of decreasing a building’s demand for energy, water, and other materials and reducing a building’s negative impacts on human health and on the local environment. It is an increasingly mainstream approach to construction and development. In

California and most of the country, the amount of greenhouse gas emissions directly related to the construction and operation of buildings is second only to emissions from transportation, and the location of buildings has a strong impact on transportation behavior. According to the U.S. Green Building Council, buildings annually consume more than 30 percent of the total energy and 60 percent of the electricity used in the United States. Since the built environment usually changes very slowly over time, building decisions made now will have ramifications far into the future. New green buildings can have an accumulating, long-term impact. The green retrofit and/or adaptive reuse of existing buildings can have an immediate, short-term impact. Benefits of promoting and developing green buildings include:

- Efficient use of water, energy, lumber, and other resources, thereby minimizing maintenance and operation costs
- Designs that are site, climate, and context specific and are enjoyable for occupants
- Deconstructing, recycling, and salvaging of lumber and other building materials

Redwood City works to reduce the use of nonrenewable energy resources by requiring new buildings and additions to meet green building standards as indicated by the City's Green Building Ordinance. A variety of energy conservation techniques can be used to meet these standards, including installing a solar hot water system, upgrading to low "e" (high R-value) windows, increasing wall and attic insulation, utilizing value-engineered framing techniques, orienting the building to maximize glazed surfaces facing north and south, installing a whole-house fan, and using energy-efficient appliances.

Light Pollution: Wasted Energy

Light pollution is excessive or obtrusive artificial light from outdoor lighting that makes it difficult to see the stars at night. Many residential uses and urban areas are over-illuminated, especially with bright exterior lighting. Over-illumination is responsible for excessive wasted energy. Greater energy conservation can be achieved by changing personal habits to use light more efficiently and reduce unnecessary illumination.

Recycling

A number of recycling and recycled materials transporting businesses are located in the area near the Port of Redwood City. These businesses recycle materials including concrete, asphalt, industrial fuel, fly ash and

Recycling in Redwood City is discussed in more detail in the Built Environment Element, Infrastructure Chapter and Economic Development Chapter.

cement kiln dust, petroleum pipeline waste, and vehicles. Recycling can be considered one of the most effective means to reduce energy and carbon emissions, as well as preserve natural resources, because the materials from products can be reused.

Key Energy Conservation Considerations

- Most of the energy consumed in Redwood City is currently generated from limited, non-renewable resources.
- Many buildings in Redwood City do not take advantage of passive solar design.
- The reduction of automobile usage and related conservation of energy and reduction of pollution is imperative. Redwood City has adopted land use and circulation policies to encourage walking, biking, and the use of transit.
- Redwood City currently experiences light pollution due to over-illumination, which wastes energy and inefficiently uses natural resources.
- Incorporating and adopting energy-saving technologies may require significant initial capital investments, but may also reduce operating costs in the long run.
- Throughout the city, businesses and residents utilize products that are not reusable or have excessive and wasteful packaging.

Energy Conservation Goals, Policies, and Programs

The General Plan recognizes the importance of efficient energy use and conservation by all Redwood City residents, businesses, and institutions. These goals, policies, and programs are intended to promote more sustainable energy use, as identified in the General Plan Guiding Principle:

- ***Plan for sustainable open space, water, energy, and air quality within our finite resources.***

Goal NR-4:

Maximize energy conservation and renewable energy production in Redwood City to reduce consumption of natural resources and fossil fuels.

Policy NR-4.1: Support energy efficiency through the City's Municipal Code Green Building Ordinance.
Sustainability Focus

Policy NR-4.2: Promote the use of renewable energy and support efforts to develop small-scale, distributed energy (e.g., solar power, wind, cogeneration, and biomass) to reduce the amount of electricity drawn from the regional power grid, while providing Redwood City with a greater degree of energy self-sufficiency.
Sustainability Focus

Policy NR-4.3: Incorporate the use of energy conservation strategies in City projects and operations.
Sustainability Focus

Policy NR-4.4: Pursue efforts to reduce energy consumption through appropriate energy conservation and efficiency measures throughout all segments of the community.
Sustainability Focus

Policy NR-4.5: Conserve energy by promoting efficient and cost-effective lighting that reduces glare and light pollution.
Sustainability Focus

Implementation Programs

Procedures, Permits, Agreements, Ordinances

Program NR-13: **Energy Conservation Ordinance.** Promote sustainable building and energy conserving design, construction, and operations through the Green Building Ordinance. Encourage owners of
Sustainability Focus

existing buildings to conduct energy and water conservation retrofits.

Timeframe: Immediate
Responsible Party: City Manager Office/Economic Development; Community Development
Funding Sources: General Fund

Program NR-14:
Sustainability Focus

City Energy Efficient Fleet. Continue to use energy-efficient automobiles, equipment, and other vehicles, including hybrid vehicles, for the City's equipment and automotive fleet.

Timeframe: Ongoing
Responsible Party: City Manager Office/Economic Development; Public Works Services Department
Funding Sources: General Fund

Program NR-15:
Sustainability Focus

City Purchasing Requirements. Consider the energy and water efficiency of products as an integral part of the purchasing process for City goods and supplies. Prioritize locally available products that conserve energy and water. Establish City policies such as prohibiting the purchase of water in plastic bottles or disposable Styrofoam containers in City facilities. Consider developing a "green team" to analyze and spearhead green initiatives within the City in conjunction with the Climate Action Plan.

Timeframe: Immediate
Responsible Party: City Manager Office/Economic Development; Finance Department
Funding Sources: General Fund

Program NR-16:
Sustainability Focus

On-site Alternative Energy Sources. Encourage and promote the use of on-site alternative energy sources such as solar panel arrays, photovoltaic cells, cogeneration, and wind generation for new residential and office development projects, as well as existing buildings.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: New development, tax credits

Plans and Studies

Program NR-17:
Sustainability Focus

Small Scale Energy-Producing Technologies in Public Buildings. Analyze and research the feasibility of using small scale energy-producing technologies in public buildings, where feasible, including solar or wind energy and other green technologies.

Timeframe: Short Range
Responsible Party: City Manager Office/Economic Development; Community Development
Funding Sources: Grants, General Fund

Program NR-18:
Sustainability Focus

Small Scale Wind Power on Private Buildings. Analyze and research the feasibility and impacts of small scale energy-producing wind-powered technologies on private buildings.

Timeframe: Short Range
Responsible Party: City Manager Office/Economic Development; Community Development
Funding Sources: Grants, General Fund

Special Programs/Projects

Program NR-19:
Sustainability Focus

Alternative Energy Incentives. Utilize incentives and financing mechanisms to encourage alternative energy use for existing residential and commercial buildings. For example, evaluate whether the City can purchase large quantities of solar panels at a lower cost and resell them to existing residents and businesses.

Timeframe: Short Range
Responsible Party: City Manager Office/Economic Development; Community Development
Funding Sources: Grants, General Fund

Program NR-20:
Sustainability Focus

Over-Illumination Information and Design Assistance. Create a program that educates the public about inefficient energy use from over-illumination. Consult with developers to use methods and equipment to reduce unnecessary lighting and remove over-illumination in new development and redevelopment projects. Establish thresholds for exterior lighting to ensure that lighting provides a safe and comfortable environment appropriate for different land uses, but not in excess of what is truly needed.

Timeframe: Ongoing, Short Range
Responsible Party: Community Development
Funding Sources: Grants, General Fund

Inter-Agency and Other Organizations Consultation

Program NR-21:
Sustainability Focus

Energy Reduction Information. Consult with PG&E and community partners to provide information and educational programs to residents, employees, and businesses on various means available for reducing energy use.

Timeframe: Ongoing
Responsible Party: City Manager Office/Economic Development; Community Development
Funding Sources: General Fund

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Natural Habitat and Open Space

Redwood City residents value our open space and natural habitat areas. The city's extensive open spaces, especially near the San Francisco Bay, provide rich aquatic and animal habitat, accommodating a diversity of wildlife including birds, mammals, insects, fishes, and other marine animals. Redwood City has made efforts to preserve expansive areas of this fragile ecosystem. Additional unrestored lands in this part of the city may provide opportunities for preservation. The upland hillsides also include several extensive open space areas that are home to a variety of wildlife. Stulsaft Park and Edgewood County Park and Natural Preserve are examples of open space parks in the upland areas of Redwood City.

Surface Waters: Creeks, Tidal Waters, and Lagoons

There are two creek systems in Redwood City that provide drainage from the foothills into the San Francisco Bay: Cordilleras Creek and Redwood Creek (see Figure NR-1). These systems include numerous small, unnamed, and unmapped tributaries that drain into these creeks. Several creeks outside of the city, including Belmont Creek in Belmont, Pulgas Creek in San Carlos, and Marsh Creek in Menlo Park drain into sloughs that are within Redwood City limits.

Sloughs are narrow channels in a shallow salt-water marsh, usually flushed by the tide.

Creeks and Riparian Corridors

Creeks and riparian corridors play a large role in the city's natural habitat. Riparian corridors are unique plant communities consisting of the vegetation growing near a river, stream, lake, lagoon, or other natural body of water. Riparian corridors preserve water quality by filtering sediment from runoff before it enters rivers and streams, help protect stream banks from erosion, provide a storage area for flood waters, and provide food and habitat for fish and wildlife.

Redwood Creek and riparian habitat

Redwood Creek

Redwood Creek and its three tributaries flow through most of the length of the city. Redwood Creek crosses into Redwood City from the Menlo Country Club in the Town of Woodside. Emerald Branch, Jefferson Branch, and Stulsaft Branch originate in the hills northwest of Redwood Creek. Jefferson Branch flows into Redwood Creek near Main Street in Downtown. Redwood Creek flows through a culvert under U.S.

Legend

- Lake
- Bay Channel
- Tidal Flat
- San Francisco Bay
- Tidal Marsh
- Diked Marsh
- Marina
- Redwood Shores Lagoon
- Salt Ponds
- Seasonal Wetland
- Sloughs and Creeks
- South Bayside System Authority Impoundment
- Natural Hillside
- Non-Native Annual Grassland

Creeks

- Covered
- Open

Base Map Features

- City Boundary
- Sphere of Influence
- Railroad

* *Restoration in progress in 2009.*

NR-1: Natural Resources Areas

Daylighting is the re-establishment of a stream or creek from a pipe, culvert, or drainage system into an above-ground channel. Generally the above-ground channel is in a more natural state.

101 and enters the San Francisco Bay between Bair and Greco Islands. Redwood Creek is visible at grade for most of its length and flows in a concrete walled channel through urban areas of the city. Redwood Creek has native fishes within the upper watershed of the creek. The City considers opportunities to daylight and restore portions of this creek to increase fish and plant habitat.

Cordilleras Creek

Cordilleras Creek and its one main tributary originate in the hills above Edgewood County Park. Cordilleras Creek flows along the northwestern boundary of the city until it reaches the tidally influenced waters near Smith Slough and Steinberger Slough. Cordilleras Creek is above ground for its entire length with the exception of culverted sections at road crossings. Cordilleras Creek has some native fish species within the creek, although protected species such as steelhead may not currently be able to spawn within this creek due to migration barriers and lack of suitable spawning habitat. Cordilleras Creek presents opportunities for continued restoration of native vegetation within the creek, thereby enhancing habitat for native and protected fish species.

Redwood Creek between Main Street and Veterans Boulevard

Tidal Waters

Tidal waters are those that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun.

Tidal waters of the San Francisco Bay include Belmont Slough, Steinberger Slough, Smith Slough, Redwood Creek, Westpoint Slough, and Corkscrew Slough. Belmont Slough is north of Redwood Shores. Steinberger Slough runs between Redwood Shores and Bair Island. Redwood Creek separates Bair Island from the Port of Redwood City. Westpoint Slough is between Greco Island and the salt ponds to the southwest. Corkscrew Slough separates middle from outer Bair Island. Smith Slough separates inner from middle Bair Island.

Tidal waters provide both deep and shallow water habitat for invertebrates, Bay fishes, and a variety of birds. The channels provide habitat for invertebrates and fishes such as rock crab, opossum shrimp, leopard shark, bat ray, brown rockfish, and California halibut. The channels provide habitat to birds including canvasback, surf scoter, ruddy duck, Forster's tern, black-crowned night heron, and western/Clark's grebe, among others. The channels also provide corridors for fishes such as Chinook salmon and steelhead. In addition, harbor seals use marsh areas adjacent to Bay channels and smaller sloughs as resting or haul-out sites during high tides.

Lagoons

During the Great Depression, a major waterway and diamond-shaped turning basin was excavated in Redwood City to facilitate location of a new port to serve the San Francisco Bay Area. However, plans for a new port came to a halt because large cargo ships would not be able to pass under the existing overhead power lines. The channel, formerly planned as a shipping channel to serve a new port, is today the main Redwood Shores Lagoon.

Redwood Shores lagoons provide aquatic, waterfowl, and migrating bird habitat, while also functioning as stormwater retention ponds.

The Redwood Shores lagoons are a focal point of the development and contribute to the area's visual aesthetics, aquatic and bird habitat, and recreation (boating, swimming, and windsurfing). The lagoons also serve as stormwater retention ponds for the area, storing surface runoff during periods of high tide in San Francisco Bay. The City's Public Works Services Department manages the overall operation and maintains publically owned portions of the lagoon, in cooperation with the City's Department of Parks, Recreation and Community Services and San Mateo County, State, and federal oversight agencies. Private property owners are responsible for maintaining the lagoon bank.

The San Francisco Regional Water Quality Control Board has developed detailed guidelines for the management of lagoons such as the Redwood Shores lagoons. Redwood City has adopted the Redwood Shores Lagoon Management Plan to serve as an operations and monitoring manual.

Bay Wetlands and Ecosystem

Wetlands' organic materials can filter out pollutants and improve water quality in streams and creeks.

Tidal marshland and wetland ecosystems are among the most biologically productive natural ecosystems in the world. In the San Francisco Bay Area, wetlands are the lungs of the Bay, giving life to hundreds of fish and wildlife species that depend on wetlands for survival and billions of small organisms that thrive in Bay mud to form the base of the food chain. In

addition to providing vital habitat for fish and wildlife, wetlands provide major benefits to the community including clean water, recreational opportunities, and flood and erosion control. Further, wetlands may be able to mitigate some of the impacts resulting from sea-level rise and associated flooding.

There is a range of wetlands in the city including saltwater and freshwater marshes, mudflats, sandflats, seasonally ponded areas, sloughs, vernal pools, baylands, and seasonal wetlands (Figure NR-1). Wetlands can be used for water contact and non-water contact recreation, and wildlife habitat, including habitat for rare and endangered species.

Bair Island, part of the Don Edwards San Francisco Bay National Wildlife Refuge discussed in more detail below, is considered an estuarine wetland. The island, now undergoing habitat restoration, is home to many animal and plant species. Some of the animals on the island include the harbor seal, California clapper rail (an endangered species), salt marsh harvest mouse (an endangered species), great blue heron, black-crowned night heron and snowy egret. Pickleweed is a native salt marsh plant species that supports a variety of species, including the salt marsh harvest mouse. Native cordgrass creates prime habitat for the clapper rail. Also found in the salt marsh are alkali heath, salt marsh dodder and jaumea. Marsh gumplant is found at higher elevations on the island.

Bair Island wetlands and tidal waters

Agencies Responsible for Protection and Enhancement of the San Francisco Bay

There are a number of federal and State agencies that have some responsibility for the protection and/or enhancement of the San Francisco Bay. These agencies include, but may not be limited to:

- U.S. Environmental Protection Agency (EPA)

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- San Francisco Bay Regional Water Quality Control Board
- State Lands Commission

In addition to these agencies, the Bay Conservation and Development Commission (BCDC) was established to encourage the Bay's responsible use. BCDC's jurisdiction includes the San Francisco Bay, tidal areas up to the mean high tide level, and marshlands up to five feet above sea level.

Bair Island natural habitat and wildflowers that typically bloom in the spring

Tidal Flats

Tidal flats are coastal wetlands that form when mud is deposited by tides. Tidal flats are adjacent to Greco Island and Bair Island and present in Steinberger Slough, West Point Slough, and Corkscrew Slough. Tidal flats include mudflats, sandflats, and shellflats. Tidal flats, biologically rich with invertebrate organisms, provide important foraging habitat for a variety of migratory shorebirds. This habitat also provides important breeding and/or foraging habitat for Bay fishes.

Tidal and Salt Marshes

Tidal marsh is vegetated wetland that is subject to tidal action. Tidal marsh includes salt marsh and tidal brackish marsh. Salt marsh occurs in saline areas, while tidal brackish marsh occurs in areas where there is significant freshwater influence. In Redwood City, tidal and salt marshes occur on Greco Island, Bird Island, and Bair Island. A variety of grasses and other plant species are common in these marsh areas.

Species that use tidal marsh for breeding and foraging include a large number of invertebrates, fish, and small mammals. There are also a wide variety of shorebirds, waterfowls, and songbirds that forage and nest in the tidal marshes. Raptors that forage and breed in the tidal marshes are also common.

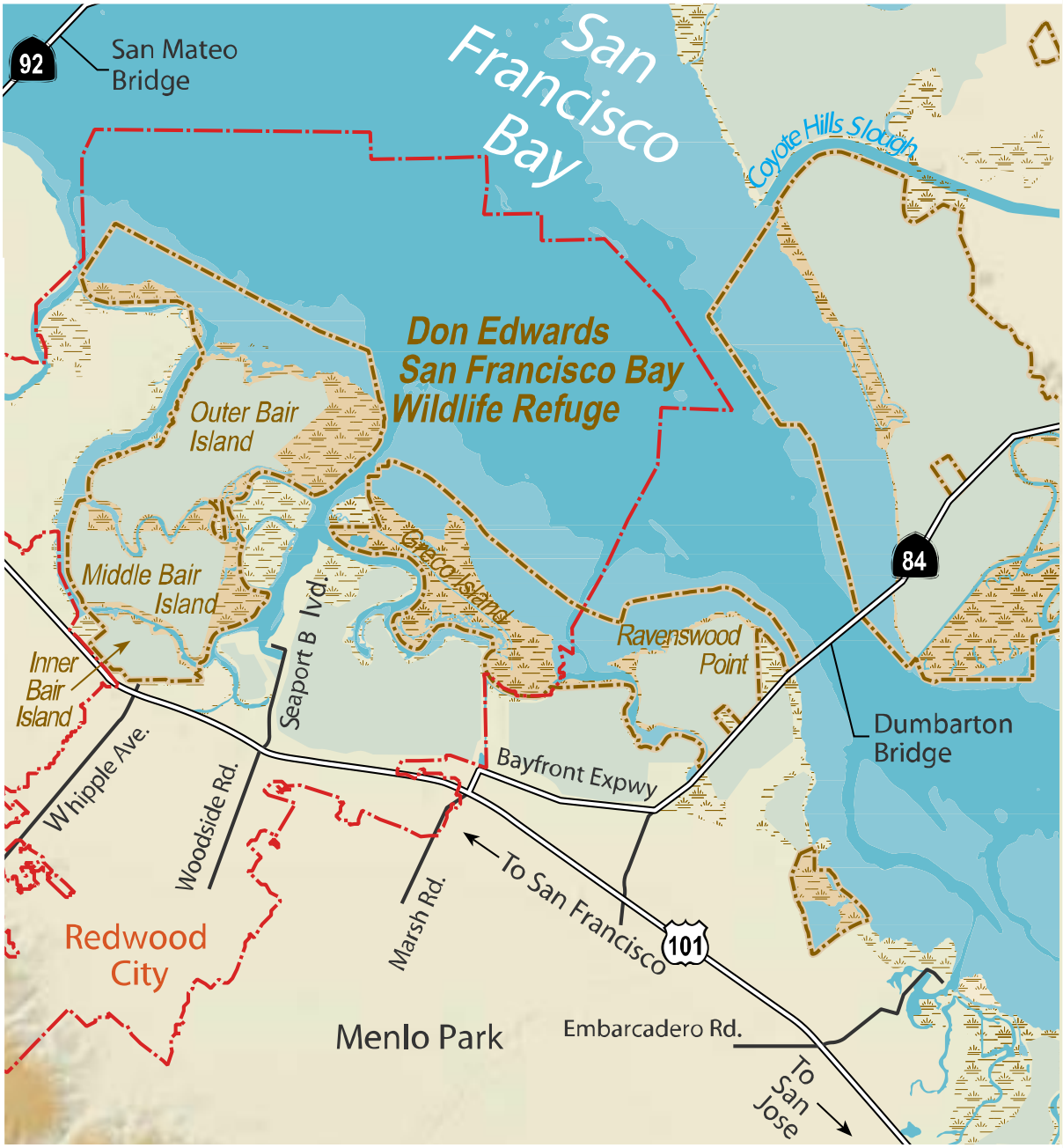
Don Edwards San Francisco Bay Wildlife Refuge

Don Edwards San Francisco Bay National Wildlife Refuge (DESFBNWR), created in 1974, is located in the southern portion of the San Francisco Bay and has the distinction of being the first "urban" National Wildlife Refuge in the United States. The refuge includes 23,000 acres of open bay, salt ponds and marshes, mud flats, and vernal pools. Within Redwood City, the DESFBNWR includes Bird Island near Redwood Shores; Inner, Middle, and Outer Bair Islands; and Greco Island near Pacific

Shores (Figure NR-2). Bair Island is undergoing restoration to enhance wetland habitats, provide access to the public for wildlife-oriented education and recreation, and help with flood management within the South Bay area.

Redwood City has encouraged recent efforts to increase restoration efforts for wetlands and tidal marshland. Recently approved restoration projects include the Preserve at Redwood Shores (formerly known as Area H), located on the Redwood Shores peninsula. This project will preserve more than 90 acres of marshland, and re-create the tidal marshes that existed prior to the diking and human development of the early 1900s. The Preserve also includes the development of new townhomes, an elementary school, and a local park on the remaining area of the site.

The restoration of native tidal marshes was a condition of approval for this project. However, initial restorative activities are only the first phase of a successful wetland restoration process. The developer of the Preserve will also fund and complete a five-year maintenance and monitoring program. After five years, the restoration process will reach completion, but long-term maintenance of the wetlands is vital to its continued success. To ensure that maintenance continues, the developer will entrust the property to an appropriate public interest entity with a non-wasting endowment sufficient to fund the long-term maintenance of the site at no cost to the public entity or taxpayers. The most likely recipient of the restored wetlands is the Don Edwards San Francisco Bay National Wildlife Refuge, which has expressed interest in taking ownership of the land. The Preserve at Redwood Shores is located within the legislative boundary available for acquisition but not owned by U.S. Fish and Wildlife Service (USFWS) and not presently part of the DESFBNWR.



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Source: Don Edwards San Francisco Bay National Wildlife Refuge, U.S Fish & Wildlife Service, March 2003. <http://www.fws.gov/desfbay/>

Note. This exhibit is from US Fish & Wildlife Service. The City of Redwood City has included its corporate boundary on this exhibit for reference purposes only.

Don Edwards San Francisco Bay National Refuge
Marsh
Redwood City

Figure NR-2: Don Edwards San Francisco Bay Wildlife Refuge

~~Figure NR-2: Don Edwards San Francisco Bay Wildlife Refuge~~

Urban Runoff, Water Quality, and Flood Control

Urban runoff consists of water that has drained from human-made, non-porous surfaces in densely populated areas. These surfaces consist of roads, freeways, sidewalks, roofed structures, parking lots, and industrial sites, among others. Any form of precipitation and/or irrigation can scour these surfaces and wash away the materials on top of and from which the surfaces are made. Much of urban terrain is non-porous and does not have the ability to filter or biodegrade contaminants like natural soils are capable of doing. Suspended sediment is the primary pollutant in urban runoff.

Urban runoff from the surrounding watershed impacts not only the biological diversity and functionality of San Francisco Bay and Redwood City's creeks, but also its water quality. This runoff includes various pollutants, such as fecal materials from pets, oil and grease, fertilizers, and other urban-based pollutants. As the water transports pollutants within the watershed system, it pollutes creeks and travels into the San Francisco Bay.

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State and federal regulations work to protect watershed and recharge areas. In particular, the National Pollutant Discharge Elimination System (NPDES) and the State Regional Water Quality Control Board mandate control of urban runoff to eliminate the percolation of pollutants from surface runoff into underground water supplies and open bodies of water. At the local level, cities must ensure provision of vegetated swales, buffers, and infiltration areas in new development projects. Best management practices for stormwater runoff include designing

sidewalks, roads, and driveways utilizing alternative materials to minimize impervious surfaces.

Flood Control

Redwood City has not established any flood corridors, defined here as areas where annual flooding takes place. The areas of the city where flooding has been known to occur are identified in the Public Safety Element, Hazards Management Chapter.

Areas in Redwood City that may accommodate floodwater and stormwater runoff, thereby facilitating groundwater recharge and stormwater management, exist along some portions of our local creeks. Redwood City has miles of concrete lined channels or box culverts to capture stormwater and transport it to the Bay. Redwood Shores lagoons and the Pacific Shores' play fields are designed to accommodate stormwater retention in the event of a major storm. Landscape impoundments and a demonstration garden exist on the South Bayside System Authority (SBSA) water treatment facility site, which could potentially serve as retention locations. Additionally, local parks and other large school playing fields, portions of public easements, including Hetch Hetchy, could offer opportunities for stormwater and floodwater retention.

Natural Hillside

Vegetation within the hillsides includes grasslands, coast live oak woodland, northern and central coast scrubs, chamise chaparral, and central coast riparian scrub. These grasses, scrub, riparian, and woodland areas provide foraging and nesting areas for a variety of insects, reptiles and amphibians, and birds. Some small- to medium-sized mammals are also known to forage in these areas, including black-tailed deer, bobcat, coyote, and mountain lion, among others. These mammals crisscross the larger open spaces areas that are a part of the Midpeninsula Regional Open Space District and other protected open spaces and parks.

Edgewood I
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discussed in
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Places and
Connection

Other pockets of open space exist throughout the city, including publically and privately owned lands. For example, areas around water tank sites as well as along the Hetch Hetchy right-of-way provide open space areas that can foster some habitat linkages. Other open spaces are publically or privately owned, such as Canada College and religious institutions.

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Edgewood County Park and Natural Preserve

Edgewood County Park and Preserve, owned and operated by San Mateo County, is a natural open space park and preserve located in southwestern Redwood City. The Park's 467 acres of woodlands and grasslands afford scenic hiking and sightseeing opportunities. It also has significant wildlife habitat, and is part of the regional San Francisco Peninsula open space system.

Key Natural Habitat and Open Space Considerations

- Redwood City's natural habitat and open space areas have a rich diversity of wildlife including birds, mammals, insects, fishes, marine animals, and flora.
- Daylighting and restoring Redwood Creek has the potential to increase plant and fish habitat.
- Continual restoration of native vegetation within Cordilleras Creek presents opportunities for preservation of native and protected fish species.
- Urban runoff from streets, sidewalks, parking lots, and roofs washes urban-based pollutants into the watershed system and into the San Francisco Bay.

Natural Habitat and Open Space Goals, Policies, and Programs

Open space in Redwood City is a finite resource that must be preserved and protected. The following goals, policies, and implementation programs are aimed at implementing the General Plan Guiding Principle:

- ***Plan for sustainable open space, water, energy, and air quality within our finite resources.***

Goal NR-5:

Protect, restore, and maintain creeks, sloughs, and streams to ensure adequate water flow, prevent erosion, provide for viable riparian plant and wildlife habitat and, where appropriate, allow for recreation opportunities.

Policy NR-5.1: Restore, maintain, and enhance Redwood City's creeks, streams, and sloughs to preserve and protect riparian and wetland plants, wildlife and associated habitats, and where feasible, incorporate public access.
Sustainability Focus

Policy NR-5.2: Limit construction activities to protect water quality in creeks and streams.
Sustainability Focus

Policy NR-5.3: Except for floating home communities, marinas, and the infrastructure necessary for the communities and marinas, prohibit building and development activities to establish a creek buffer zone, based on the site and floodplain characteristics and/or where sensitive species, communities, or habitats occur within the creek or 100-year floodplain, unless construction methods or other methods can substantially minimize damage from potential flooding.

Policy NR-5.4: In conjunction with new development located along existing creeks and streams and where appropriate, incorporate daylighting for culverted portions or other bank naturalizing approaches for channeled sections as a means of creek and stream restoration.
Sustainability Focus

Policy NR-5.5: Except for floating home communities, marinas, and infrastructure necessary for the communities and marinas, regulate, and perhaps restrict, new development, grading, fills, and other land disturbances located immediately adjacent to a creek, stream, or in a 100-year floodplain, unless construction

methods or other methods to minimize potential damage from flooding are implemented.

Policy NR-5.6: Promote natural stream channel function.
Sustainability Focus

Policy NR-5.7: Preserve and protect riparian vegetation including non-native vegetation that functions to shade the creek and provide wildlife habitat.
Sustainability Focus

Goal NR-6:

Preserve and enhance the baylands, natural wetlands, and ecosystem to assist with improved air quality and carbon dioxide sequestration.

Policy NR-6.1: Ensure that new development minimizes encroachment into sensitive baylands habitats, and minimizes direct or indirect impact to sensitive biological resources while optimizing the potential for mitigation.
Sustainability Focus

Policy NR-6.2: Restore and maintain marshlands including tidal flats, tidal marshes, and salt marshes as appropriate.
Sustainability Focus

Policy NR-6-3: Consult with federal, State and regional agencies to oversee the restoration of Bair Island and Area H bayfront lands, and seek funding for the purchase and restoration of additional wetland habitat.
Sustainability Focus

Policy NR-6.4: Allow for appropriate public access to bayfront open space lands for recreation activities while protecting and restoring the bayfront's natural ecosystem and minimizing environmental damage, as appropriate.

Policy NR-6-5: Take steps to reduce urban runoff into creeks and the Bay.
Sustainability Focus

Policy NR-6-6: Consider protection of upland areas adjacent to wetlands as potential habitat.
Sustainability Focus

GOAL NR-7:

Reduce pollution from stormwater runoff in our creeks and the San Francisco Bay.

Policy NR -7.1: Support appropriate stormwater pollution mitigation measures.
Sustainability Focus

Policy NR -7.2: Encourage the use of site and landscape designs that minimize surface runoff and retain or detain stormwater runoff, minimizing volume and pollutant concentrations.
Sustainability Focus

Policy NR -7.3: Promote continued maintenance, restoration, and daylighting of creeks in Redwood City through ecologically enhancing methods and any future enhancement ordinance.
Sustainability Focus

Goal NR-8:

Identify, protect, and restore open spaces, sensitive biological resources, native habitat, and vegetation communities that support wildlife species.

Policy NR-8.1: Pursue efforts to protect sensitive biological resources, including local, State, and federally designated sensitive, rare, threatened, and endangered plant, fish, and wildlife species and their habitats.
Sustainability Focus

Policy NR-8.2: Preserve and create contiguous wildlife habitat and movement corridors.
Sustainability Focus

Policy NR-8.3: Replace and control invasive, non-native vegetation and animals to the extent feasible in parks and open space areas. Encourage restoration of native vegetation.
Sustainability Focus

Policy NR-8.4: Consult with regulatory agencies, nonprofit groups, and other organizations in the conservation, maintenance, acquisition, and restoration of open space lands that include wildlife, plant species, and animal habitat.
Sustainability Focus

Policy NR-8.5: Enhance fisheries habitat and restore access for native fishes in Redwood City's creeks.
Sustainability Focus

Implementation Programs

Procedures, Permits, Agreements, Ordinances

Program NR-22: **Sensitive Species Identification.** For development applications proposed for sensitive biological resource areas, require qualified biologists to identify and map all sensitive biological resources on the project site, including local, State and federally sensitive, rare, threatened, and endangered plant, fish, and wildlife species and their habitats using methods and protocols in accordance with the U.S. Fish and Wildlife Service, California Department of Fish and Game, and California Native Plant Society; and make recommendations for avoiding sensitive biological resources to the maximum extent feasible and pursuant to Program BE-2 in the Urban Form and Land Use Chapter of the Built Environment
Sustainability Focus

Element. These requirements shall be satisfied prior to the approval of any development proposal for the site.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: Developer fees

Program NR-23:
Sustainability Focus

Mitigate Adverse Impacts of Development. For new development proposals in the city in which unavoidable harm or removal of sensitive biological resources could occur, require the development of a compensation plan prior to City approval of any development proposal for the site. Compensation could include purchase of mitigation credits for the affected habitat types at an established mitigation bank, or preservation and enhancement of in-kind habitat types (preferably onsite). Required compensation ratios will be developed on a case-by-case basis in consultation with U.S. Army Corps of Engineers, California Department of Fish and Game, San Francisco Regional Water Quality Control Board, and/or the U.S. Fish and Wildlife Service.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: Developer fees

Program NR-24:
Sustainability Focus

Creek Daylighting. Pursue efforts to maintain and restore creeks and streams to a more natural state through such measures as "daylighting" (reestablishing portions of the creeks above ground, where physically feasible), replacing concrete channels with natural creek beds and native vegetation, restoring riparian habitat, and creating linear parks along creeks while maintaining flood control capabilities. Complete a feasibility study that prioritizes the most appropriate sections and creeks to daylight. Include these strategies as part of the comprehensive plan accommodation for trails.

Timeframe: Mid Range
Responsible Party: Community Development; Public Works Services Department; Parks, Recreation, and Community Services Department
Funding Sources: Grants, General Fund, Capital Improvement Program

Program NR-25:
Sustainability Focus

Creek Improvements. Wherever a new development or redevelopment project occurs on property containing or adjacent to an existing creek, require the project developer to improve and enhance the portion of the creek on or adjacent to the property, including daylighting and creek restoration wherever feasible. Permitted uses within creek buffer zones should be limited to habitat restoration, native riparian plantings, appropriate erosion control, trails, and flood control. Consider implementing a land banking system for critical open space areas along creek corridors.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: Developer fees

Program NR-26:
Sustainability Focus

Creek Enhancement Ordinance. To minimize unfiltered stormwater runoff, reduce flooding risks, and preserve creek areas for natural restoration, establish a Creek Enhancement Ordinance that will allow the City to:

- Enforce protection of reasonable setback areas along existing creeks and streams from encroachment by buildings, pavement, or other impervious surfaces, and other inappropriate uses
- Create adequate room for maintenance and potential public recreational use.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: Developer fees, General Fund

Program NR-27:
Sustainability Focus

Creek Property Owner Incentives. Consider offering incentives to property owners along creeks to correct and/or improve creek banks. Incentives may include rebates, classes/seminars, technical assistance, among others.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: General Fund

Program NR-28:
Sustainability Focus

NPDES. Continue to comply with all provisions of the National Pollutant Discharge and Elimination System (NPDES) permit, and support regional efforts by the San Francisco Bay Regional Water Quality Control Board (RWQCB) to improve and protect water quality.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development; City Manager Office/Economic Development
Funding Sources: Development fees

Program NR-29: **State and Federal Regulations.** Endeavor to comply with State and federal regulations pertaining to habitat and wildlife preservation.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: Developer fees

Program NR-30:
Sustainability Focus

SMCWPPP. Implement the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) performance standards in the protection of creeks, streams, and watersheds.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development
Funding Sources: General Fund

Program NR-31:
Sustainability Focus

Water Quality Improvement. Require the integration of water quality protection/improvement techniques (e.g., use of vegetated swales or landscaping for water drainage along streets and for expansive parking lots) for new development. As feasible, incorporate water quality techniques when completing street improvements.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development
Funding Sources: Developer fees

Special Programs/Projects

Program NR-32:
Sustainability Focus

Fisheries Restoration. Enhance fisheries habitat and wetlands that provide nurseries for fish, restore access for native fishes through the stream system by removing barriers to fish movement (i.e. drop structures, concrete debris, dams, hanging culverts), and replace culverts with bridges, where feasible.

Timeframe: Long Range
Responsible Party: Public Works Services Department
Funding Sources: Grants

Program NR-33: Sustainability Focus

Upland–Bayland Transition Zones. Determine if maintaining upland-bayland transition zones is necessary for wildlife refuge during hightide events and flooding. If appropriate, develop buffer zones between upland-bayland transition zones and development.

Timeframe: Short Range
Responsible Party: Community Development
Funding Sources: General Fund

Outreach, Education

Program NR-34:

Stormwater Runoff Education. Conduct outreach and education programs to residents, businesses, and industries in partnership with San Mateo Countywide Water Pollution Prevention Program to minimize the discharge of pollutants to the storm drain system.

Timeframe: Ongoing
Responsible Party: Community Development; City Manager Office/Economic Development; Public Works Services Department
Funding Sources: General Fund

Program NR-35: Sustainability Focus

Volunteer Creek Maintenance. Support volunteer efforts by property owners and other interested parties to maintain, restore, and enhance urban creeks and riparian habitat though periodic clean-ups and planting of riparian vegetation.

Timeframe: Ongoing
Responsible Party: Community Development; City Manager Office/Economic Development; Public Works Services Department
Funding Sources: General Fund

Program NR-36: Sustainability Focus

Natural Space Community Involvement.

- Promote and encourage community involvement in urban ecology projects that preserve or expand neighborhood green space, create community, and connect people to their natural environment.

- Support and consult with local volunteer groups and nonprofit organizations to maintain and restore creek ecology, hydrology, and riparian habitat though periodic clean-up programs, restoration projects, and education.
- Consult with volunteer organizations (e.g., CityTrees) to carry out tree planting programs and public education on tree planting and proper tree maintenance.

Timeframe: Ongoing
Responsible Party: City Manager Office/Economic Development; Parks, Recreation, and Community Services Department; Community Development
Funding Sources: General Fund, grants

Program NR-37: Sustainability Focus

Hillside Conservation. Engage public and private property owners, especially owners of large hillside properties, and encourage them to potentially enhance, preserve, or protect natural hillside areas to support habitat and wildlife corridors.

Timeframe: Ongoing
Responsible Party: Community Development
Funding Sources: General Fund

Inter-Agency and Other Organizations Consultation

Program NR-38:

Watershed Multi-Jurisdictional Consultation and Pollution Prevention. Pursue consultation with jurisdictions that share watersheds with Redwood City to limit pollution in stormwater runoff and contribute to improvements that limit pollution entering the Bay and prevent flooding.

Timeframe: Mid Range
Responsible Party: Public Works Services Department; Community Development; City Manager Office/Economic Development
Funding Sources: General Fund

Program NR-39: Sustainability Focus

State and Federal Consultation. Consult with State and federal agencies, the San Mateo County Parks Department, the Mid-Peninsula Regional Open Space District and the City and County of San Francisco in the acquisition, preservation, and restoration of existing and future open space lands.

Timeframe: Ongoing

Sustainability Focus

Responsible Party: Parks, Recreation and Community Services Department; Community Development
Funding Sources: General Fund

Program NR-40:
Sustainability Focus

BCDC and Interested Stakeholders Consultation. Consult with the Bay Conservation Development Commission (BCDC) and other interested stakeholders to integrate public recreation and access opportunities with restoring and preserving bayfront lands.

Timeframe: Long Range
Responsible Party: Community Development
Funding Sources: Grants

Urban Forest

Many neighborhood streets throughout the city include matures trees that provide shade and create a green canopy.

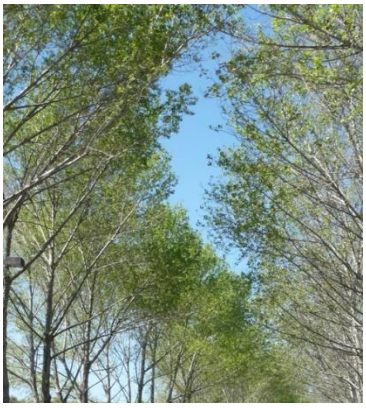
Redwood City was named for the giant redwood trees that were logged from the forests in the hills to the west. Today, Redwood City understands the importance of preserving and maintaining the trees in our community. Trees significantly enhance the overall beauty of the city and raise the quality of life for all who live and work here. In addition, urban forests also provide environmental benefits. Trees contribute to clean air, produce oxygen, slow stormwater runoff, provide cooling shade, support local wildlife, sequester carbon, control soil erosion, and create sound barriers.

Redwood City's urban forest is comprised of a street tree system, trees on parks and other public lands, and trees on private properties and in yards throughout the city. The urban forest is most prominent in certain parts of Redwood City where trees have fully matured, particularly in the older neighborhoods. Street trees can be key features that define neighborhoods; often the presence or absence of a tree canopy can be the single most identifiable character feature in an area.

Urban Forest in a Redwood City neighborhood

Redwood City is committed to preserving existing trees, replacing trees that are damaged or dying, and expanding the urban forest throughout our community. A tree takes many years to grow and only minutes to cut down. Removal is the last resort option, when no other reasonable alternative can correct a problem. For example, the City has employed innovative measures, such as rubber sidewalks, to ensure that the roots of street trees are not excessively pruned and that tree health and stability is preserved. The City also strives to plant more trees than are removed each year.

Trees can, however, present a hazard if left to grow untended. They can block views at intersections or die due to diseases. Trees need to be pruned periodically, promoting healthy trees and creating a safer outdoor environment. The City has adopted two tree ordinances: the Street Tree Ordinance and Tree Preservation Ordinance. The Street Tree Ordinance protects all street trees growing on public property adjacent to roadways. The Tree Preservation Ordinance protects all trees growing on private property with trunk sizes that exceed 38 inches in circumference measured between six and 36 inches above grade.



Trees line the streets in Seaport Center, creating a beautiful green streetscape.

Redwood City is home to many native trees, including Live Oaks and White Oaks, which help define our streets and neighborhoods. The city's native oak population includes many very old specimens. Preserving native trees is a goal in Redwood City, and the City will continue to develop standards to ensure that preserving native trees remains a priority.

Redwood City is fortunate to have active community organizations that help preserve and plant trees. CityTrees is a volunteer group, formed in 2000, to promote and support urban forestry efforts in Redwood City. CityTrees works with the Redwood City Public Works Services Department to plant and maintain trees along Redwood City's streets, at schools, and on other publicly owned property. Saturday tree plantings are sponsored by CityTrees once per month during the spring and fall. The City also provides best management information, answers to frequently asked questions, and other information regarding trees and the urban forest on the City's website.

Redwood City is a Tree City USA. The Tree City USA program, sponsored by the Arbor Day Foundation, the USDA Forest Service, and the National Association of State Foresters, provides direction, technical assistance, public attention, and national recognition for urban and community forestry programs in thousands of towns and cities.

Key Urban Forest Considerations

- While the city has a large number of trees within the public realm (streets, parks, etc.) most trees are located on privately owned property. As such, programs and public awareness programs should encourage private tree plantings and maintenance.

- Education is necessary to increase public awareness about the benefits of healthy urban forests.

- Poor tree selection can lead to problems in the future; as such, trees in both public and private realms should be carefully chosen.

- Poor tree care practices by residents and untrained arborists can result in hazards.

Urban Forest Goals, Policies, and Programs

The goal, policies, and implementation programs of the Urban Forest Chapter are aimed at protecting existing mature trees, planting and growing new trees, and educating the public about proper tree maintenance and the benefits of an urban forest. The goal, policies, and programs implement the following Guiding Principle:

- ***Plan for sustainability within our finite resources including but not limited to open space, water, energy, and air quality.***

Goal NR-9: Maintain, enhance, and increase the number of trees on both public and private property to provide the maximum benefits of improved air quality, compensate for carbon dioxide production, reduce stormwater runoff, and mitigate the urban heat island effect.

Policy NR-9.1: Preserve, maintain, and expand the number of trees in Redwood City's urban forest, on both public and private property.
Sustainability Focus

Policy NR-9.2: Require new trees to be planted and/or plant new trees in sufficient number, as identified on a site by site basis, on sites within the Environmental Justice communities, and on sites designated as sensitive receptors (i.e. schools or hospitals) that are in close proximity to industry, heavily traveled freeways and roads, and other similar pollution sources in order to mitigate air pollution.
Sustainability Focus
EJ Focus

Policy NR-9.3: Select appropriate trees for Redwood City, focusing especially on native and landmark tree types.
Sustainability Focus

Policy NR-9.4: Provide a coordinated program of education, outreach, and advocacy for tree planting, maintenance, and support.

Implementation Programs

Procedures, Permits, Agreements, Ordinances

Program NR-41: **Tree Protection and Preservation Enforcement.** Continue to enforce all ordinances pertaining to tree protection and preservation including the Street Tree Ordinance and Tree Preservation Ordinance.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development
Funding Sources: General Fund

Program NR-42: **Tree Preservation Ordinance.** Revise the Tree Preservation Ordinance (Chapter 35 in Municipal Code) to establish categories of trees to indicate priorities for preservation. Categories would provide a framework for tree permits and various levels of required mitigation measures. Consider including the following categories in the Tree Preservation Ordinance:

Sustainability Focus

- ***Established Tree.*** Any tree that is at least 10 inches in diameter, as measured 4.5 feet above natural or finished grade.
- ***Mature Tree.*** Any tree that is at least 26 inches in diameter, as measured 4.5 feet above natural or finished grade.
- ***Landmark Tree.*** Any tree which is at least 48 inches in diameter, as measured 4.5 feet above natural or finished grade or in excess of 40 feet in height.
- ***Indigenous Tree.*** A naturally growing tree of the following species: redwood (Sequoia sempervirens); coast live oak (Quercus agrifolia); valley oak (Quercus lobata); canyon live oak (Quercus chrysolepis); blue oak (Quercus douglasii), black oak (Quercus kelloggii), canyon oak (Quercus chrysolepis), leather oak (Quercus durata), California buckeye (Aesculus californicus); California bay (Umbellularia californica), Douglas fir (Pseudotsuga menziesii), arroyo willow (Salix lasiolepis), sycamore (Platanus racemosa), box elder (Acer negundo var. californica), big leaf maple (Acer macrophyllum), Oregon ash (Fraxinus latifolia), and other species known to be native to the region.

As part of the Tree Preservation Ordinance revision, consult the Community Task Force on Tree Policies Study, September 2006.

Timeframe: Short Range
Responsible Party: Public Works Services Department
Funding Sources: Grants, General Fund

Plans and Studies

Program NR-43:
Sustainability Focus

EJ Focus

Tree Master Plan. Adopt and implement a Tree Master Plan for the planting and maintenance of trees growing on public and private property throughout Redwood City. The plan shall consider urban form, aesthetics, and the overall positive benefit trees provide to neighborhood character and the environment. In crafting the plan, consider the relationship of street tree planting to other General Plan goals and policies, including environmental justice, pedestrian orientation, neighborhood character, and complete streets. Through the Tree Master Plan, establish standards for tree requirements for new development, tree maintenance, species selection, and minimum shading and tree canopy coverage. Species selection shall prioritize those tree types that have the ability to provide sufficient shade, reduce pollutants, produce oxygen, reduce stormwater runoff, retain moisture, minimize impact to sidewalks, have few known disease and insect pests, and acceptable fruit and flower litter. Establish tree criteria (such as minimum number of trees for street frontage) for new development and redevelopment projects, and to facilitate canopy cover on streets and parking areas. The plan shall acknowledge neighborhood context throughout and special considerations associated with more urban settings such as Downtown and major corridors. Consult the Community Task Force on Tree Policies Study, September 2006, as part of the Tree Master Plan planning process.

Timeframe: Short Range
Responsible Party: Public Works Services Department
Funding Sources: General Fund, grants

Special Programs/Projects

Program NR-44:
Sustainability Focus

EJ Focus

Trees in Public Rights-of-Way. Where appropriate, plant trees in available public right-of-way locations, particularly in the Environmental Justice communities, per the proposed Tree Master Plan. Continue to invest in and manage challenges associated with planting street trees in narrow planting strips.

Timeframe: Ongoing
Responsible Party: Public Works Services Department; Community Development
Funding Sources: General Fund

Program NR-45: **Tree Replacement.** Require removed trees, whether on public or private property, to be replaced with a new tree or trees in the closest appropriate planting site to mitigate loss, as feasible.

Sustainability Focus

Timeframe: Ongoing
Responsible Party: Community Development; Public Works Services Department
Funding Sources: Developer fees, General Fund

Program NR-46: **Tree City USA.** Maintain the City's Tree City USA designation.

Timeframe: Ongoing
Responsible Party: Public Works Services Department
Funding Sources: General Fund

Outreach, Education

Program NR-47: **Tree Education.** Through educational workshops, seminars, and other methods, encourage property owners, residents, organizations, and businesses to plant and maintain trees in appropriate locations, particularly in the Environmental Justice communities.

EJ Focus

Timeframe: Long Range
Responsible Party: Public Works Services Department
Funding Sources: Grants, General Fund

Program NR-48: **Tree Planting.** Continue to plant trees in open spaces and along streets particularly in the Environmental Justice communities. In community or neighborhood beautification projects, encourage neighborhood associations and individual property owners to plant and maintain trees. Utilize coast live oaks and valley oaks wherever possible in order to maintain a long-term canopy of these prominent indigenous species. Focus live oak plantings in neighborhoods including Emerald Hills and focus valley oak plantings in neighborhoods between U.S. 101 and Alameda de las Pulgas (especially near creeks and tributaries).

Sustainability Focus

EJ Focus

Timeframe: Short Range

Responsible Party: Public Works Services Department
Funding Sources: Grants, General Fund