6 Conservation and Climate Change

Introduction

The Conservation and Climate Change Element addresses the management of San Rafael's natural resources, including soil, minerals, water, air, vegetation, and wildlife. It identifies environmentally sensitive areas in the city and includes policies for their long-term protection. This Element also addresses the steps the City will take to address global climate change. Policies in this Element are supplemented by the San Rafael Climate Change Action Plan, which prescribes more specific actions to reduce greenhouse gas emissions. While climate action is a theme that underpins the entire General Plan, it is especially relevant to this Element.

The City recognizes that the well-being of its human and natural communities are inseparable. Natural communities must be conserved for their ecological value and capacity to support life. Conservation is also essential to San Rafael's economy and the health and safety of its residents. This Element includes policies to protect the quality of our air, conserve water and improve water quality, and use energy more efficiently, including a shift from fossil fuels to renewable energy sources. The Element recognizes the importance of living more sustainably, replacing the resources we use and changing past behaviors to better recognize the cycle of life.

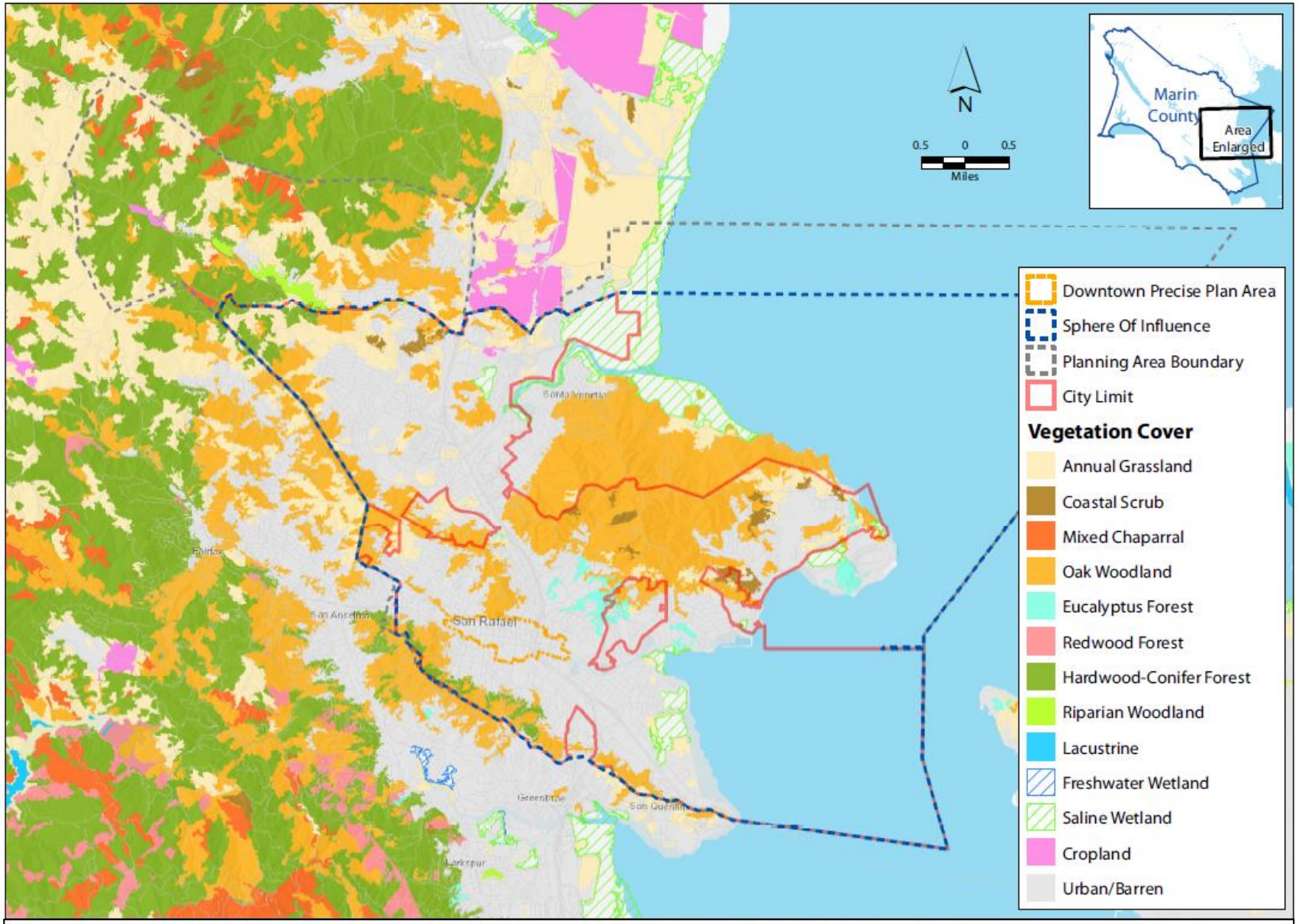
This Element is organized around five broad goals:
C-1: Supporting Our Natural Communities
C-2: Clean Air
C-3: Clean Water
C-4: Sustainable Energy Management
C-5: Reduced Greenhouse Gas Emissions

As appropriate, narrative text and maps have been included along with the policies and programs to provide context and a better understanding of conditions and issues.

San Rafael's Natural Communities

The San Rafael Planning Area contains a mosaic of urbanized and undeveloped land. Urban uses occupy most of the valleys and some of the former marshlands that once bordered San Francisco Bay. Undeveloped lands primarily consist of woodlands and grasslands, traversed by riparian areas along creeks and drainageways. Marshlands remain along the shoreline of San Pablo Bay and the lower reaches of San Rafael, Gallinas, and Miller Creeks.

Figure 6-1 shows the different vegetative cover types in the Planning Area, based on data from the U.S. Forest Service. This information is also summarized in Table 6-1. Although native vegetation has been substantially altered, the presence of large undeveloped areas and shoreline marshes allow for a diverse range of plant and animal life. Major habitats found in the Planning Area are summarized below.



SOURCES: EVEG from USFS showing CALVEG CWHR Type (aggregated); accessed on April 23, 2019; USGS base map by ESRI and NGS. Map produced by www.digitalmappingsolutions.com on 9/5/2019.

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Figure 6-1:

Vegetative Cover

Urban Development and Ornamental Landscaping

Urban development occupies 38 percent of the land cover in the San Rafael Planning Area. Most plants in these areas are non-native ornamentals and ground covers, as well as scattered native trees such as coast live oak, valley oak, bay laurel, and coast redwood. Non-native trees such as Monterey pine, American elm, and Eucalyptus occur throughout these areas. Some of the non-native species are considered highly invasive because of their ability to spread and eventually dominate natural areas if left unmanaged.

The diversity of urban wildlife depends on the extent and type of landscaping and open space, as well as the proximity to natural habitat. Trees and shrubs used for landscaping provide nest sites and cover for wildlife adapted to developed areas. In San Rafael, numerous native bird species inhabit urban areas, along with mammals such as deer, racoon, skunk, and coyote.

Forest and Woodlands

Forest and woodlands also occupy 38 percent of the San Rafael Planning Area. This is the dominant cover on San Pedro Mountain and along Southern Heights Ridge. These areas include oak woodland, coniferous forest, and montane forest. Dominant species include coast live oak, California bay laurel, coast redwood, Douglas fir, tan oak, and black oak. Understory varies depending on the amount of sunlight, but may include various ferns, poison oak, sorrel, and other herbaceous species. Highly invasive broom has spread through much of the understory, inhibiting foraging opportunities for wildlife and displacing native shrub and groundcover species. Residential uses are interspersed in some of the woodland areas.

The mature forests and woodlands in the San Rafael Planning Area provide nesting and foraging opportunities for numerous species of birds. They also provide essential food resources for eastern fox squirrels, native grey squirrels, acorn woodpeckers, scrub jay, and other birds. Forests and woodlands are an important habitat type due to their relatively high wildlife habitat value. They continue to be threatened by Sudden Oak Death (SOD), exacerbating fire hazards and altering habitat for woodland species.

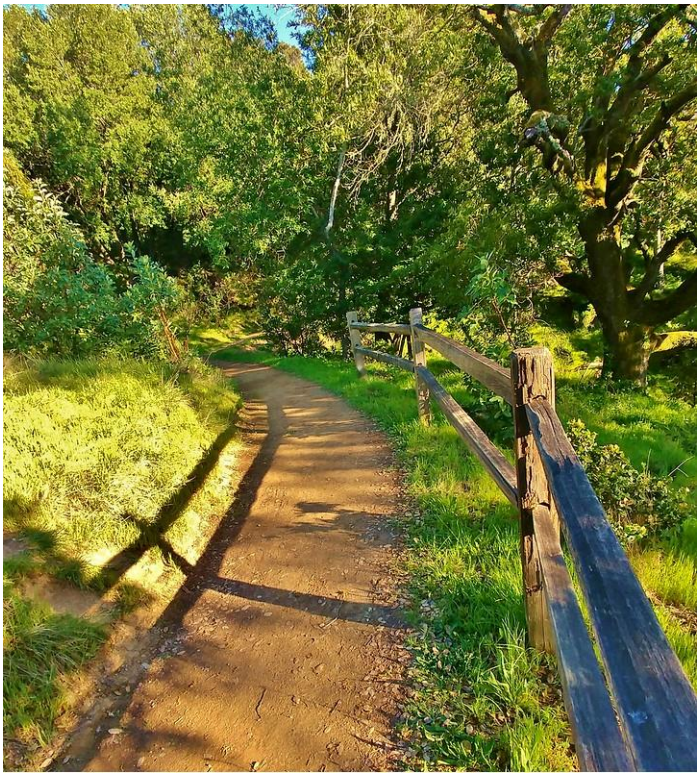


Photo Credit: Frank Johnson

Grasslands

Grasslands occupy about 14 percent of the Planning Area, including parts of Big Rock Ridge in Lucas Valley, the margins of Santa Margarita Valley, the lower Gallinas Valley, and many hillside slopes. These aeras are generally comprised of introduced grasses and broadleaf species, as grazing has eliminated most of the native grasslands. Remnant native grasslands may still occur in some locations, where their protection is considered a high priority.

Grasslands support a variety of mammals, birds, and reptiles, and provide foraging habitat for raptors. Common species include western fence lizard, gopher snake, grey fox, coyote, striped skunk, gopher snake, and ground squirrel. The rodent, bird, and reptile populations provide foraging opportunities for avian predators such as owls and red-tailed hawks. Many species use the

grassland for only part of their habitat requirements, foraging in these areas and seeking cover in nearby tree and scrub areas.

Riparian Woodland and Scrub

Riparian vegetation occurs along Miller Creek, San Rafael Creek, and segments of Gallinas Creek and other drainageways. These areas represent just 107 acres of the Planning Area, but their linear nature and access to water make them particularly important. Dominant cover includes willows, valley oak, coast live oak, buckeye, and bay laurel. Highly invasive understory species have become problematic in these areas, outcompeting and replacing native shrubs and groundcover and threatening their habitat value.

Creek channels serve as movement corridors for many species, which benefit from the protective cover. Common species include black-tailed deer, black-tailed jackrabbit, brush rabbit, and red and grey fox, among others.

Freshwater/Brackish Marsh

Freshwater and brackish marsh occurs along waterbodies and on the edges of tidally-influenced reaches of San Rafael Creek, Gallinas Creek, Miller Creek and tributary drainages. The brackish marshes transition into coastal salt marsh at the mouth of creeks and fringe of the Bay. Dominant plant types vary with salinity, with pickleweed, saltgrass, and bulrush in the brackish areas near the Bay.

Photo Credit: Frank Johnson

These areas have high importance to wildlife and provide a source of drinking water and protective cover. They also serve as nesting areas and movement corridors. Numerous bird species are present, including shorebirds such as egrets and great blue herons. There are also predators such as raccoon, skunk, and coyote. Marsh areas also include aquatic life such as frogs, toads, turtles and fish.

Coastal Salt Marsh, Mudflats and Open Water

Tidal marsh is a highly productive plant community consisting of salt-tolerant plants with moderate to dense cover. Plants at a given location vary depending on their tolerance to inundation and salinity. Lower elevation areas contain pickleweed and saltgrass, while elevated benches contain cordgrass, alkali heath, and gumplant. The coastal salt marsh habitat often occurs adjacent to tidal mudflats that are devoid of vegetation. In San Rafael, coastal marsh occurs near the mouth of Gallinas Creek and the mouth of San Rafael Creek (Tiscornia Marsh).

Tidal marsh, mudflat and open water habitats support a variety of wildlife species specifically adapted to salt-tolerant vegetation and tidal regimes. A majority of the special status species known or expected to occur in the region occur within these areas, including California Ridgway's rail, California black rail, and salt marsh harvest mouse. Tidal marshes also provide foraging habitat for special-status raptors such as white-tailed kite and marsh hawk. The mudflats support a diverse assemblage of benthic macro-invertebrates which in turn attracts large numbers of migrating and wintering shorebirds. These species forage on mudflats as they are exposed by receding tides, often concentrating at the water's edge. Wading birds and ducks also forage in these areas. At high tide, tidal channels also provide important habitat for fish and other aquatic species.

Other Vegetative Cover Types

A number of native and non-native vegetative cover types occur along the margins of the San Rafael Planning Area. Chaparral occupies an estimated 233 acres, primarily in the upper Lucas Valley watershed. Coyote brush and other coastal scrub areas occupy an estimated 195 acres. Stands of non-native eucalyptus occupy an estimated 230 acres and are dominated by blue gum, with a sparse understory of non-native grasses. Colonies of monarch butterfly are known to overwinter in some of these stands, with at least two colonies reported in China Camp State Park. The Planning Area also includes rock outcrops, which provide a unique habitat for wildlife.

Table 6-1: Vegetative Cover in the San Rafael Planning Area

Vegetation Cover/ Habitat Type	San Rafael Sphere of Influence		San Rafael Planning Area	
	Acres	% of Total	Acres	% of Total
Annual grassland	1,323.9	9.0%	2,773.2	13.9%
Coastal scrub	195.5	1.3%	195.5	1.0%
Mixed chaparral	0	0.0%	232.9	1.2%
Oak woodland	4,462.8	30.5%	5,302.4	26.6%
Hardwood-conifer forest	268.0	1.8%	2,295.6	11.5%
Riparian woodland	12.3	0.1%	107.1	0.5%
Lacustrine	0.5	0.0%	0.5	0.0%
Freshwater marsh	0	0.0%	5.1	0.0%
Saline marsh	1060.3	7.2%	1,196.5	6.0%
Eucalyptus	230.8	1.6%	230.8	1.2%
Cropland	12.4	0.1%	40.2	0.2%
Urban/Barren	7,078.8	48.3%	7,548.4	37.9%
TOTAL	**14,645.3**	**100.0%**	**19,928.3**	**100.0%**

• - Landcover types occupy an estimated 14,645.3 acres of the 26,193 acres of the SOI and 19,928 acres of the 34,586 acres of the Planning Area, with the remaining acreages being unvegetated open waters of the bay.
Source: CALVEG GIS data, USDA Forest Service, 2019.

Goal C-1: Supporting Our Natural Communities

Protect, restore, and enhance San Rafael's environment and natural communities.

San Rafael is defined by natural features such as hillsides, ridgelines, creeks, shorelines, and open water. It includes diverse ecosystems such as woodlands, grasslands, chaparral, wetlands, and riparian areas. These areas provide habitat for interconnected communities of plants and animals, some of which are threatened and endangered. The City is committed to the wellbeing and careful management of its environment. Natural communities must be protected, supported, and sustained into the future.

Protection, restoration and enhancement of damaged habitats is important for the continued health of San Rafael's environment. The City will continue its efforts to manage undesirable invasive species and encourage landscaping with native species and other plants that are compatible with California's dry summer climate. It also encourages protection of creeks, drainageways, and wetlands, recognizing not only the intrinsic value of these areas as natural habitat but also their role in mitigating climate change impacts. The policies and programs below address wetlands, creeks and watersheds, hillsides, plant and animal life, trees, invasive species control, mineral resources, and light pollution.

Wetlands

Wetlands are areas that are periodically or permanently inundated by surface or ground water, and that support vegetation adapted to life in saturated soil. In the San Rafael area, they are typically found near the Bay and along the tidal sections of local creeks. Wetlands are recognized as important features on a regional and national level due to their high value to fish and wildlife, use as storage areas for storm and floodwaters, and groundwater recharge, filtration, and purification functions. They are also fragile natural resources and are susceptible to flooding, erosion, soil-bearing capacity limitations and other hazards.

For many years, wetlands around San Francisco Bay were compromised by landfill, urban development, and agriculture, greatly diminishing their extent. Today they are protected by state and federal laws, and subject to technical standards to confirm their presence or absence on individual sites.

Policy C-1.1: Wetlands Preservation

Require appropriate public and private wetlands preservation, restoration and/or rehabilitation through the regulatory process. Support and promote acquisition of fee title and/or easements from willing property owners.

> ***Program C-1.1A: Wetlands Overlay District.*** *Continue to implement wetlands policy through a Wetlands Overlay zoning district that is based on wetland delineations consistent with US Army Corps of Engineers criteria.*
>
> ***Program C-1.1B: Tiscornia Marsh Restoration.*** *Support restoration plans for Tiscornia Marsh adjacent to Pickleweed Park in the Canal neighborhood. The project will raise and improve a degraded levee to stabilize and potentially restore an eroding tidal marsh, reducing the community's vulnerability to rising tides and flooding.*

Tiscornia Marsh Restoration

The 20-acre Tiscornia Marsh is located at the mouth of the San Rafael Canal. A recently funded restoration and sea level rise adaptation project will use dredged sediment to create new habitat and improve an adjacent levee. The project will reopen a diked marsh to tidal action, while also protecting the nearby Canal neighborhood from tidal flooding. Grant funds for the project come from Measure AA, a parcel tax that generates about $25 million a year to protect and restore San Francisco Bay.

Program C-1.1C: McInnis Marsh Restoration. *Support restoration plans for McInnis Marsh, providing improved habitat for protected species, flood protection for McInnis Park golf course, and improved trail connections along the San Pablo Bay Shoreline.*

Policy C-1.2: Wetlands and Sea Level Rise

Optimize the role of wetlands in buffering the San Rafael shoreline against the future impacts of sea level rise.

See also Program S-3.6A for a discussion of the sea level rise benefits of horizontal levees

Policy C-1.3: Wetland Protection and Mitigation

In order to protect and preserve valued wetlands, loss of wetlands due to filling shall be avoided, unless it is not possible or practical. Compensatory mitigation for the loss of wetlands shall be required in the event that preservation is not possible or practical due to conditions such as the location, configuration, and size of the wetland.

Program C-1.3A: Compensatory Mitigation Requirements. *For permanently impacted wetlands, lost wetland area shall be replaced on-site and in-kind at a minimum ratio of 2:1 (e.g., 2 acres for each acre lost). If on-site mitigation is not possible or practical, off-site mitigation shall be required, preferably in the same drainage basin or a nearby Marin watershed if the same basin is not available, at a minimum replacement ratio of 3:1. Temporarily impacted wetlands may be restored and revegetated to pre-project conditions.*

Program C-1.3B: Conditions for Mitigation Waivers*. The City may waive the compensatory mitigation requirement on a case by case basis for wetlands restoration projects and for fill of wetlands that are less than 0.1 acres in size, provided that all of the following conditions are met: (1) the wetland is isolated (e.g., it is not within, part of, or directly connected or hydrologically linked by natural flow to a creek, drainageway, wetland, or submerged tidelands); (2) it is demonstrated by an*

independent wetland expert that preservation would not result in a functioning, biological resource; (3) the City has determined that filling would result in a more appropriate and desirable site plan for the project; and (4) the City verifies that applicants have received all required permits and complied with all other mitigation requirements from resource agencies with wetland oversight.[1]

Program C-1.3C: Revision of Mitigation and Waiver Requirements. *Consider revisions to mitigation requirements and waiver conditions that reflect best practices, sea level rise adaptation needs, and consistency with the requirements used by state and federal agencies and other Bay Area jurisdictions.*

Policy C-1.4: Wetland Creation

Require that any wetlands created to mitigate losses as described in Policy C-1.3 are similar in habitat type and at least equal in functional quality to the wetlands being filled.

Program C-1.4A: Wetland Plans and Monitoring. *Wetland plans shall be prepared by a qualified wetland restoration ecologist in consultation with appropriate federal and state resource agencies. Such plans shall require annual monitoring for a specified period of time to determine mitigation success. Contingency measures to deal with the potential for lack of success should be included in the plan.*

Program C-1.4B: Timing of Wetlands Creation. *Restoration or creation of wetlands should be completed prior to construction of the development. Where construction activities would adversely impact wetland restoration or creation, the restoration or creation may be completed after construction of the development, as determined through development review.*

Program C-1.4C: Mitigation Banking. *Support the creation of wetland mitigation banking sites within the City. This would allow the collection of mitigation fees from multiple projects to be combined to construct or restore larger, more viable wetlands in designated locations rather than constructing small compensatory wetlands on or near each development site. This could include an inventory of priority restoration areas for future projects that may require compensatory off-site mitigation.*

Policy C-1.5: Wetland Setbacks

Maintain a minimum 50-foot development-free setback from wetlands, including, but not limited to, paving or structures. Setbacks of greater than 50 feet may be required on lots of two or more acres as determined through development review. The City may waive this requirement for minor encroachments if it can be demonstrated that the proposed setback adequately protects the functions of the wetland to the maximum extent feasible and will not cause cumulative impacts on functioning wetlands.

See Goal S-3 (and associated policies and programs) in the Safety and Resilience Element regarding sea level rise

[1] *US Army Corps of Engineers and the Regional Water Quality Control Board.*

Watersheds and Creeks

The San Rafael Planning Area includes parts of approximately nine watersheds, as shown in Figure 6-2. The largest watersheds are:

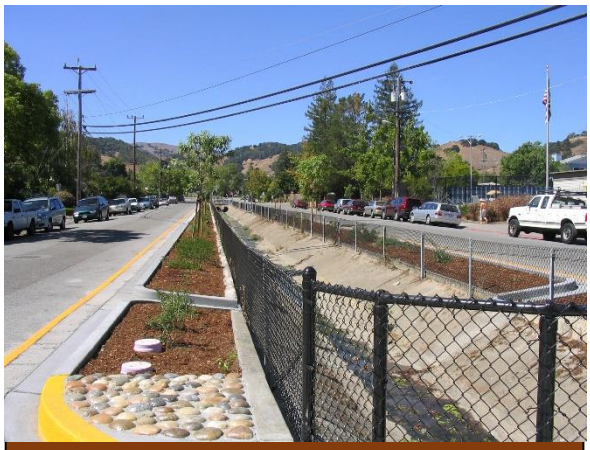
- **Gallinas Creek.** The Gallinas Creek Watershed encompasses 5.6 square miles and includes two drainage areas—the North Fork and the South Fork. The north fork is the larger of the two and flows from Terra Linda to the South Gallinas Slough near McInnis Park. The South Fork originates in the Los Ranchitos area and San Pedro Ridge and flows through the Civic Center and Santa Venetia areas into the Gallinas Slough. The creek is tidally influenced and partially channelized east of Highway 101.

- **San Rafael Creek.** The San Rafael Creek Watershed is located in the southern part of the city and encompasses 11 square miles. The creek originates in the hills above Tamalpais Cemetery and flows through Sun Valley and highly urbanized neighborhoods towards the San Rafael Canal. It enters San Rafael Bay in the vicinity of Pickleweed Park.

- **Miller Creek.** The Miller Creek Watershed is located on the northern edge of the Planning Area. It encompasses 12 square miles and flows eastward from the west end of Lucas Valley to the baylands northeast of McInnis Park. The lower watershed flows through narrow, leveed channels into San Pablo Bay.

The three creeks are fed by numerous tributaries, some of which flow within their natural banks and others of which have been routed into culverts, trapezoidal channels, or other modified drainageways. The condition of these creeks and drainageways varies greatly; some support riparian vegetation and wildlife; others are urbanized or even invisible.

San Rafael's creeks are vital to creek health, water infiltration, stormwater pollution attenuation, habitat for wildlife and are to be protected and enhanced. Their restoration can enhance wildlife habitat, reduce flooding, and support the City's sustainability and climate action programs.

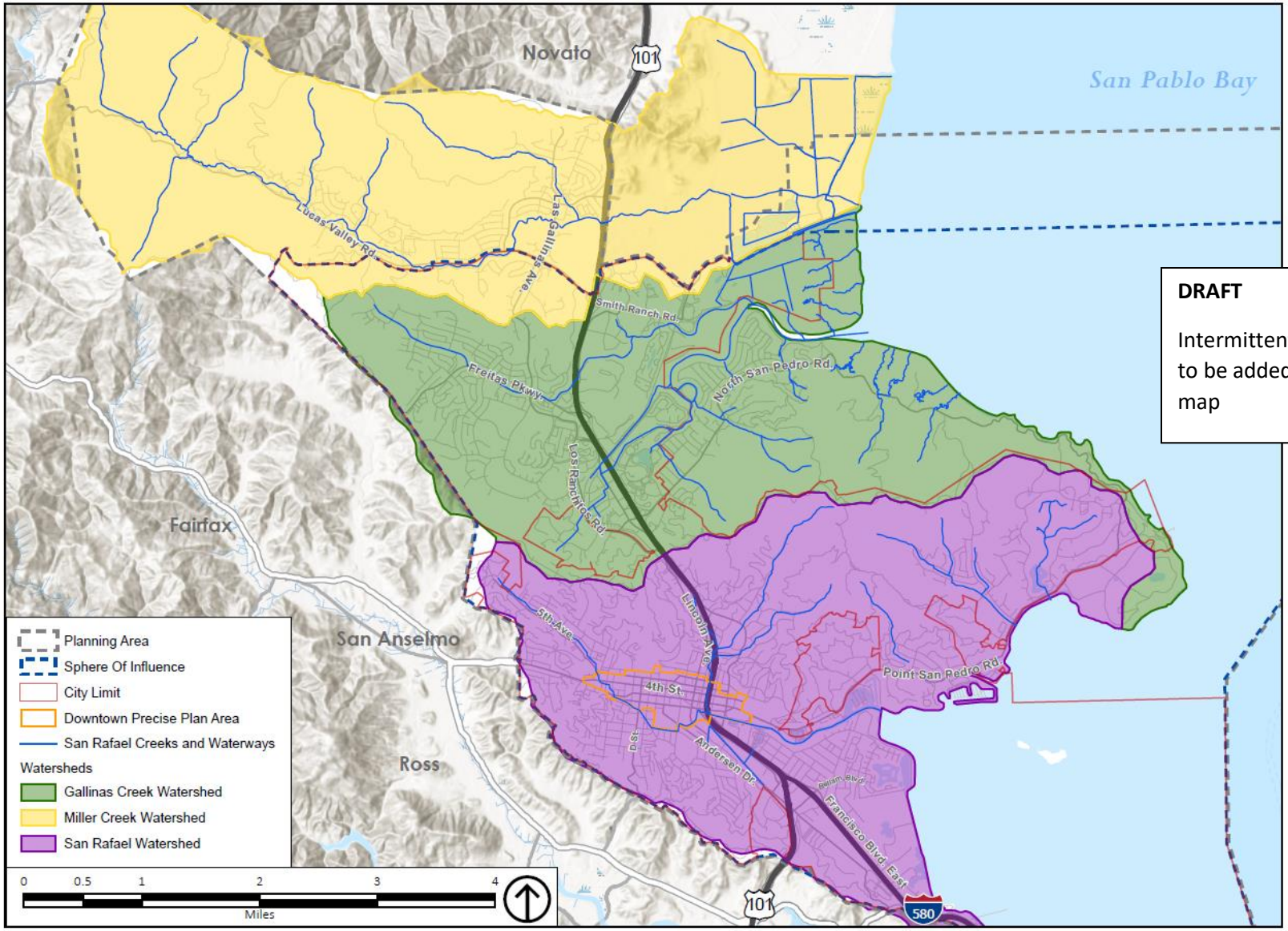


Perennial, Intermittent, or Ephemeral?

Figure 6-2 shows perennial and intermittent streams in the San Rafael Planning Area using data from the National Hydrography Dataset (NHD). **Perennial streams** are well-defined channels that contain water year-round. Generally, there is continuous flow of water, provided in part by groundwater. An **intermittent stream** also flows in a well-defined channel but only contains water for part of the year. The flow is heavily influenced by stormwater runoff. Santa Margarita Creek, pictured above, is considered an intermittent stream by the NHD. (*)

Ephemeral streams flow only during rain events in a typical year. The streambeds are located above the water table and are not fed by groundwater. Runoff from rainfall is the primary water source. Ephemeral streams are too numerous to show on Figure 6-2 but may be viewed using MarinMaps GIS. Vegetation along these watercourses can help reduce erosion, provide shade, and contribute to groundwater recharge.

(*) According to the USGS, the terms "stream" and creek" are interchangeable. The term "drainageway" is used to define open swales or localized depressions that lack defined banks and transport stormwater to creeks, wetlands, or waterbodies such as the Bay; as well as man-made ditches or channels that drain developed properties.



Source: ESRI 2017, County of Marin, City of San Rafael, 2019

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Figure 6-2:

Perennial and Intermittent Creeks

Policy C-1.6: Creek Protection

Protect and conserve creeks as an important part of San Rafael's identity, natural environment, and green infrastructure. Except for specific access points approved per Policy C-1.7 (Public Access to Creeks), development-free setbacks shall be required along perennial and intermittent creeks (as shown on Figure 6-2) to help maintain their function and habitat value. Appropriate erosion control and habitat restoration measures are encouraged within the setbacks, and roadway crossings are permitted.

Program C-1.6A: Creek and Drainageway Setbacks: *Maintain the following setback requirements in the Municipal Code:*

(a) *A minimum 25-foot development-free setback shall be maintained from the top of creek banks for all new development (including but not limited to paving and structures), except for Miller Creek and its tributaries, where a minimum 50-foot setback shall be maintained. Setbacks up to 100 feet may be required in development projects larger than two acres where development review determines that a wider setback is needed to maintain habitat values, and in areas where high-quality riparian habitat exists. The City may waive the setback requirement for minor encroachments if it can be demonstrated that the proposed setback adequately protects the functions of the creek to the maximum extent feasible and the results are acceptable to appropriate regulatory agencies.*

(b) *Drainageway Setbacks: Drainageway setbacks shall be established through individual development review, taking into account existing habitat function and values.*

Program C-1.6B: Municipal Code Compliance. *Ensure that the San Rafael Municipal Code is consistent with local, state, and federal regulatory agency requirements for erosion control and natural resource management and is amended as needed when these regulations change. Local public works activities shall comply with the Municipal Code.*

Program C-1.6C: Creek and Drainageway Mapping. *Work collaboratively with local environmental organizations and institutions to prepare updated maps of creeks and drainageways and to evaluate the potential for restoration.*

Policy C-1.7: Public Access to Creeks

Provide pedestrian access to creeks and along creeks where such access will not adversely affect habitat values.

Program C-1.7A: Creek Access on Public Land. *Proactively identify and create access points to creeks on public lands.*

Program C-1.7B: Public Access in Development Along Creeks. *Use the development review process to identify and secure areas appropriate for creek access.*

Policy C-1.8: Creek Education and Awareness

Increase awareness of San Rafael's creeks and their role as green infrastructure supporting local climate resilience and flood protection initiatives.

Program C-1.8A: Publicity. *Use the City's website to publicize information about creek and waterway protection and access. Where appropriate, partner with local schools, conservation and environmental groups, business organizations, and others to increase awareness of the City's creeks and waterways.*

Program C-1.8B: Creek Signage. *Develop attractive signage and/or educational displays identifying local creeks, describing native habitat and history, and reminding visitors of what they can do to protect water quality.*

See also Policy PROS-3.10 on environmental education and Program C-3.6A on removal of plastics from creeks, marshes, and the Bay

Policy C-1.9: Enhancement of Creeks and Drainageways

Conserve or improve the habitat value and hydrologic function of creeks and drainageways so they may serve as wildlife corridors and green infrastructure to improve stormwater management, reduce flooding, and sequester carbon. Require creek enhancement and associated riparian habitat restoration/ creation for projects adjacent to creeks to reduce erosion, maintain storm flows, improve water quality, and improve habitat value where feasible.

Program C-1.9A: Watercourse Protection Regulations. *Maintain watercourse protection regulations in the San Rafael Municipal Code. These regulations should be periodically revisited to ensure that they adequately protect creeks and drainageways. Consider specific measures or guidelines to mitigate the destruction or damage of riparian habitat from roads, development, and other encroachments.*

Program C-1.9B: Creek Restoration. *Encourage and support efforts by neighborhood associations, environmental organizations, and other interested groups to fund creek enhancement, restoration, and daylighting projects, as well as creek clean-ups and ongoing maintenance programs.*

Program C-1.9C: Upper Gallinas Watershed Restoration. *Support implementation of creek restoration projects in the Upper Gallinas Creek Watershed, consistent with the Restoration Opportunities Report prepared in December 2016. It remains a priority of the City to restore the creek by removing the concrete channel, creating a walkway/ bikeway alongside, and planting native trees to provide shade and filter runoff. Pursue grants and other funds, including capital improvement projects and general operating funds, to restore natural creek conditions and native vegetation.*

Program C-1.9D: Restoration of San Rafael, Mahon, and Irwin Creeks. *Pursue opportunities for creek restoration and beautification along San Rafael, Mahon, and Irwin Creeks, building on past efforts supporting biological and ecological restoration, education, and water quality improvements along these waterways.*

See Goal C-3 for additional policies on water quality

Hillsides

Elevation in the Planning Area ranges from sea level to 1,800 feet. Much of the Planning Area consists of steep hillsides. Hillsides have important scenic value and shape the City's identity. There are also landslide and erosion hazards associated with building on steep slopes. The City has adopted a hillside development overlay zoning district to identify hillside areas, and applies special standards and design guidelines in these areas.

Policy C-1.10: Hillside Preservation

Encourage preservation of hillsides, ridgelines, and other open areas that serve as habitat and erosion protection as well as visual backdrops to urban areas.

See the Safety and Resilience Element for policies addressing protection of steep slopes and wildfire prevention and protection actions on hillsides. See the Community Design Element for policies on hillside and ridgeline protection.

> ***Program C-1.10A: Hillside Management and Design Guidelines.*** *Continue to implement Hillside Design Guidelines as well as management practices that promote ecological health, hazard reduction, and climate change mitigation*.

Plant and Animal Life

Vegetation, fish, and wildlife habitat are essential to San Rafael. As our climate changes and natural hazards increase, the need for preserving the diversity of our plant and animal species becomes even more important. For threatened and endangered species, habitat protection is also required by state and federal law. The City recognizes the need to protect native plants and animals and their habitats before their populations are so low that they must be listed as threatened or endangered. Habitat protection and restoration is also a reflection of San Rafael's ecological, aesthetic and cultural values.

A number of plant and animal species in the San Rafael Planning Area have been designated as "special status species." They are legally protected under the State and/or federal Endangered Species Acts or other regulations that provide special consideration. Research performed as part of San Rafael General Plan 2040 indicated 43 special status plant species and 60 special status animal species that are known to occur or that potentially occur in San Rafael. The text box on Page 6-16 identifies some of the more familiar species but is not an exhaustive list. Many of the species are associated with wetland areas near the Bay or with protected open spaces on the fringes of the Planning Area. The General Plan EIR should be consulted for more comprehensive information on this topic.

Figure 6-3 provides general information about the location of special status species in the Planning Area.

Policy C-1.11: Wildlife Corridors

Preserve and protect areas that function as wildlife corridors, particularly those areas that provide connections permitting wildlife movement between larger natural areas.

> ***Program C-1.11A: Mapping of Wildlife Corridors.*** *Support mapping of wildlife corridors in the Planning Area. Use this data to determine where conservation easements may be appropriate in the event properties within these corridors are subdivided, or when other opportunities arise for securing such easements.*

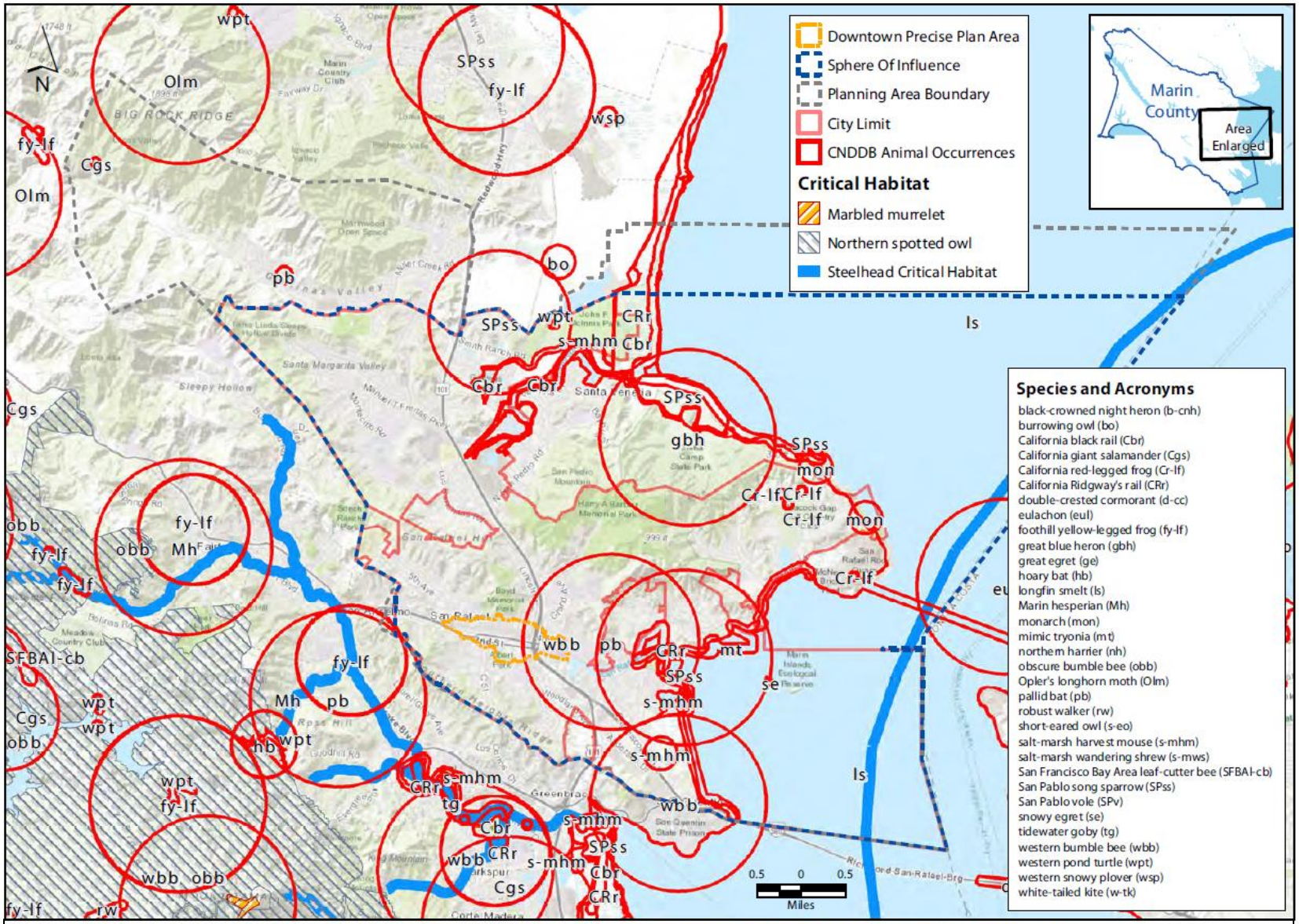
Policy C-1.12: Native or Sensitive Habitats

Protect habitats that are sensitive, rare, declining, unique, or represent a valuable biological resource. Potential impacts to such habitats should be minimized through compliance with applicable laws and regulations, including biological resource surveys, reduction of noise and light impacts, restricted use of toxic pesticides, pollution and trash control, and similar measures.

> ***Program C-1.12A: Non-Native Predators.*** *Support efforts by non-profit conservation groups, state and federal agencies, the Marin Humane Society and other organizations to reduce conflicts between human settlement and native wildlife. This includes protecting the habitat of birds and small mammals from non-native predators and restricting the use of pesticides.*

> ***Program C-1.12B: Oak Savanna and Oak Woodland Habitat Protection.*** *Require proposed developments with the potential to impact oak savanna/woodland habitat to either avoid, minimize, or compensate for the loss of such habitat. Avoidance is the preferred measure where feasible. If habitat loss is deemed unavoidable, require that direct and indirect impacts be mitigated through habitat restoration, creation, or enhancement. Mitigation requirements should be based on vegetative mass rather than the number of impacted trees.*

See also Policy C-3.6 on the conservation of nearshore waters, including the Canal and San Francisco Bay.



SOURCES: California Natural Diversity Database and USFWS Critical Habitat database accessed on April 16, 2019; USGS base map by ESRI and NGS. Map produced by www.digitalmappingsolutions.com on 8/29/2019.

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Figure 6-3:

Special Status Species

Special Status Species in the Planning Area

The list below profiles some of the better-known Special Status Species in the San Rafael Planning Area. The General Plan EIR should be consulted for a more comprehensive list.

- **Steelhead–Central California Coast** (Federally Threatened). Steelhead, a type of rainbow trout, migrate from the ocean to freshwater streams to spawn. Miller Creek is known to support a resident steelhead population. The species may be threatened by high water temperature, low rates of streamflow, low levels of dissolved oxygen, low sediment input, and stream obstructions.

- **California Red-Legged Frog** (Federally Threatened). This species occurs in and along freshwater marshes, streams, ponds, and other semi-permanent water sources. Its decline has been attributed to habitat loss and predation. Occurrences have been reported from the Peacock Gap and San Rafael Point in the eastern portion of the Planning Area. Suitable habitat remains in other locations.

- **Western Pond Turtle** (California Species of Special Concern). Western pond turtles occur in a variety of aquatic habitats, including ponds, lakes, marshes, rivers, streams, and canals with aquatic vegetation. This species has been observed at McInnis Park in the northeastern portion of the Planning Area. Other freshwater bodies and streams with deep pools may provide suitable habitat.

- **Northern Spotted Owl** (Federally and State Threatened). Northern spotted owl typically occurs in forest and dense woodland habitat. It typically nests on platforms in large trees and will use abandoned stick nests of other bird species. There are three locations where nests have been observed within or at the boundary of the Planning Area.

- **White-tailed Kite** (California Fully Protected Species). Most white-tailed kites in California occur west of the Sierra Nevada in low-lands and foothills. This species tends to nest in solitary trees and large shrubs located near suitable foraging habitat, such as the grasslands and tidal marshes.

- **Northern Harrier** (California Species of Special Concern). This species is widespread in Northern California and is found in freshwater wetlands, saltmarshes, grasslands, and agricultural fields. Suitable foraging habitat for northern harriers exists in San Rafael's grasslands and tidal marshes.

- **California Black Rail** (Federally Threatened; California Fully Protected Species). In the Bay Area, California black rails primarily inhabit pickleweed marsh areas, but they may also occupy higher marshland zones. California black rails have been detected along Gallinas Creek and the coastal salt marsh habitat in the northeastern portion of the Planning Area.

- **California Ridgway's Rail** (Federally and State Endangered; California Fully Protected Species). This species prefers tidal salt marshes dominated by pickleweed and cordgrass but may also occur in higher marsh areas. California Ridgway's rails have been identified in the tidal marsh along the mouths of Gallinas Creek and San Rafael Creek and may also be present in other tidal marsh areas.

- **Samuels (San Pablo) Song Sparrow** (California Species of Special Concern). This subspecies of sparrow is restricted to the tidal marshes and adjacent uplands around San Pablo Bay. Suitable habitat includes the coastal salt marsh habitats near the mouths of Gallinas and San Rafael Creeks and other stands of tidal marsh and adjacent uplands.

- **Salt Marsh Harvest Mouse** (Federally and State Endangered; California Fully Protected Species). This species is endemic to the tidal salt marshes of San Francisco Bay, primarily in marshes dominated by pickleweed. The mouse has been detected in the coastal salt marshes near the mouth of San Rafael and Gallinas Creeks and in the coastal salt marsh north of McInnis Park.

"Ridgway's Rail" Photo Credit: Bud Gora

Policy C-1.13: Special Status Species

Conserve and protect special status plants and animals, including those listed by State or federal agencies as threatened and/or endangered, those considered to be candidate species for listing by state and federal agencies, and other species that have been assigned special status by the California Native Plant Society and the California Fish and Game Code.

Program C-1.13A: List of Species. *Maintain current California Natural Diversity Database digital (GIS) maps and data tables listing threatened, endangered, and special status species in the San Rafael Planning Area.*

Program C-1.13B: Surveys. *Require that sites be surveyed for the presence or absence of special status species prior to development approval. Such surveys must occur prior to development-related vegetation removal.*

Program C-1.13C: Mitigating Impacts on Special Status Species. *Require that potential unavoidable impacts to special status species are minimized through design, construction, and project operations. If such measures cannot adequately mitigate impacts, require measures such as on-site set asides, off-site acquisitions (conservation easements, deed restrictions, etc.), and specific restoration efforts that benefit the listed species being impacted.*

Program C-1.13D: Steelhead Habitat. *Support efforts to restore, preserve or enhance Central California Coast Steelhead habitat in Miller Creek and other creeks.*

Policy C-1.14: Control of Invasive Plants

Remove and control undesirable non-native plant species from City-owned open space and road rights-of-way and encourage the removal and control of these species from non-City owned ecologically sensitive or fire-prone areas.

Program C-1.14A: Identification of Desirable and Undesirable Species. *Use California Invasive Plant Council (Cal-IPC) guidance for desirable and invasive plants in the development review, design review, and public lands management processes. This guidance should ensure that noxious plants are not planted in new development, on rights of way, and on public land; help inform revegetation and replanting programs; and support the management of existing vegetation.*

Program C-1.14B: Integrated Pest Management Policy. *Maintain and periodically update an Integrated Pest Management Policy (IPMP) that minimizes the application of pesticides in the city and encourages non-toxic methods to control vegetation such as properly timed goat grazing. The IPMP should be modified as needed to reflect changes in regional stormwater control requirements, data on pesticide toxicity, and the feasibility of new and less toxic methods for controlling invasive plants. Changes to the IPMP should be made through a transparent public process and should ensure that the use of any chemicals of concern is publicly noticed.*

Program C-1.14C: Removal of Invasive Species. *Support partnerships and multi-jurisdictional efforts to remove invasive plant species, reduce fire hazards, and improve habitat on public properties. Use volunteers and non-profit organizations to assist in such efforts and consult with the California Native Plant Society and similar organizations to optimize results, avoid the removal of desirable plants, and replant with appropriate plants before invasive species return. Funding from sources such as Measure A, state and regional wildfire prevention funds, utility funds, and other conservation program funds should be pursued to support these efforts.*

[insert text box on Marin Wildfire Prevention Authority public education program on ecologically sound vegetation management—per Bill Carney comments]

Program C-1.14D: Wildfire Action Plan Implementation. *Implement the provisions of San Rafael's Wildfire Action Plan (2020) relating to the control of invasive plants, including further limiting the sale or planting of highly flammable non-native plants in the city, supporting volunteer activities to remove Scotch and French broom, revising standards for Eucalyptus, providing fuel breaks on public property, and educating the public on fire-safe landscaping.*

Policy C-1.15: Landscaping with Appropriate Naturalized Plant Species

Encourage landscaping with native and compatible non-native plant species that are appropriate for the dry summer climate of the Bay Area, with an emphasis on species determined to be drought-resistant. Diversity of plant species is a priority for habitat resilience.

Program C-1.15A: Education on Desirable Plant Species. *Leverage the educational and website materials on "water-wise" plants developed by the Marin Municipal Water District and fire-prone plants from FireSafe Marin as resources for San Rafael property owners. The City should also create Resilient Landscape Templates (RLTs) that offer suggestions for homeowners to achieve beautiful, fire-resistant, drought tolerant landscaping.*

Policy C-1.16: Urban Forestry

Protect, maintain, and expand San Rafael's tree canopy. Trees create shade, reduce energy costs, absorb runoff, support wildlife, create natural beauty, and absorb carbon, making them an essential and valued part of the city's landscape and strategy to address global climate change. Tree planting and preservation should be coordinated with programs to reduce fire hazards and ensure public safety, resulting in a community that is both green and fire-safe.

Program C-1.16A: Increasing the Tree Canopy. *Implement measures to increase the tree canopy, as outlined in the City's Climate Change Action Plan. These measures include:*

a) tree planting on city-owned land
b) reviewing parking lot landscaping standards to maximize tree cover
c) minimizing tree removal
d) controlling invasive species that threaten the health of the urban forest
e) integrating trees and natural features into the design of development projects
f) encouraging trees on private property
g) increasing the diversity of trees to increase habitat value and resilience.

Program C-1.16B: Tree City USA. *Maintain San Rafael's status as a "Tree City USA" community by following best practices in urban forestry management and regularly applying for recertification.*

Program C-1.16C: Tree Preservation. *Consider ordinances and standards that limit the removal of trees of a certain size and require replacement when trees must be removed.*

See Program CDP-3.5A for additional guidance on street trees, including a proposed Street Tree Master Plan

Policy C-1.17: Tree Management

Encourage the preservation of healthy, m ature trees when development and/or construction is proposed. Site plans should indicate the location of existing trees and include measures to protect them where feasible.

Mineral Resources

The San Rafael Rock Quarry is the only mineral resource located in the San Rafael Area identified as having local, regional, or State significance by the California Division of Mines and Geology. The quarry has been in operation for over 100 years and is in the process of applying to extend its operating permit through 2044. Additional policies on Quarry operations and potential future uses may be found in the Neighborhoods Element at Policy NH-5.6.

Policy C-1.18: Mineral Resource Management

Work with the County of Marin to permit the continued use of property in the San Rafael sphere of influence for mineral resource extraction, subject to permitting procedures and mitigation requirements that reduce potential adverse impacts on the natural environment and surrounding uses.

Dark Skies

The intent of the dark sky policy below is to reduce light pollution and ensure that the potential adverse effects of lighting on night skies is considered in the future. The excessive or inappropriate use of artificial light can have serious environmental consequences for humans, wildlife, and our climate.

Policy C-1.19: Light Pollution

Reduce light pollution and other adverse effects associated with night lighting from streets and urban uses.

> ***Program C-1.19A: Dark Sky Ordinance.*** *Adopt a dark sky ordinance, including lighting standards and enforcement provisions that reduce light pollution. In the interim, refer to guidelines from the International Dark Sky Association during the review of major projects involving night lighting.*

See also Goal CDP-1 for additional policies on protecting natural features, hillsides, ridgelines, and bayfront areas, and the visual quality of San Rafael's environment and landscapes.

Photo Credit: Florian Kainz (Sept 9, 2020)

Air Quality

Goal C-2: Clean Air

Reduce air pollution to improve environmental quality and protect public health.

San Rafael will work collaboratively with jurisdictions throughout the Bay Area to achieve and maintain state and federal clean air standards. While air quality is a regional issue, the City will do its part to reduce air pollution at the local level and create a healthful environment for all San Rafael residents.

San Rafael is part of an air basin that surrounds San Francisco and San Pablo Bays, touching all nine Bay Area counties. Air quality in the region is influenced by topography, meteorology, and climate, as well as the presence of local pollution sources. In San Rafael, the city's proximity to the Golden Gate moderates the climate and air quality. During warm weather, the daytime flow of marine air is sometimes capped by a dome of warm air that acts as a lid over the region. The result can be unhealthy levels of smog. A different type of inversion occurs in the winter as cool air pools in low elevations while the air aloft remains warm. During recent years, late summer/ early fall wildfire smoke has been a serious and persistent air quality issue throughout the region.

Air quality is subject to standards aimed at protecting public health and reducing the economic and environmental costs of air pollution. The federal Clean Air Act established maximum safe concentrations for common pollutants such as carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). The text box on the next page provides an overview of these pollutants. In California, air quality is also subject to the California Clean Air Act and the oversight of the California Air Resources Board. The State rules are generally more stringent than national rules and include guidelines for locating sensitive uses near pollutant sources such as freeways.

Most of the responsibility for regulating emissions has been delegated to regional air districts. The Bay Area Air Quality Management District (BAAQMD) regulates both stationary sources such as smokestacks and indirect sources such as traffic from new development. BAAQMD also is responsible for air quality monitoring and enforcement.

Air basins that are not in compliance with State and federal standards are classified as "non-attainment" areas for those pollutants and are required to adopt Air Quality Management Plans (AQMP). These plans typically focus on reducing emissions from transportation, which is the biggest source of air pollution in the Bay Area. Internal combustion engines contribute carbon monoxide, nitrogen oxides, particulate matter, and hydrocarbons, affecting both our air and our water.

The Bay Area is considered to be a nonattainment area for State and federal ozone (O_3) standards, State and federal $PM_{2.5}$ standards, and the State coarse particulate (PM_{10}) standard. The 2017 Clean Air Plan provides the framework for specific programs to comply with the established standards. It includes strategies to reduce ozone, particulates, and toxic air contaminants, including emission control measures.

BAAQMD maintains 24 permanent monitoring stations around the Bay Area. One of these stations is in San Rafael, allowing existing and historical local air quality levels to be well documented. The data show violations of the State and federal ozone standards and federal fine particulate matter ($PM_{2.5}$) standard.

Major Air Pollutants of Concern

- **Ozone** is formed by photochemical reactions between oxides of nitrogen and reactive organic gases. It is a pungent, colorless gas that typically peaks in the summer and early fall months. Elevated ozone concentrations result in reduced lung function, with particularly acute risks for the elderly, children, and those with respiratory conditions.
- **Carbon monoxide** (CO) is formed by the incomplete combustion of fossil fuels, with motor vehicles accounting for nearly all emissions. It is a colorless, odorless gas that can cause dizziness, fatigue, and impairments to the central nervous system. It can be fatal at high levels of exposure.
- **Nitrogen dioxide** is a reddish-brown gas formed from fuel combustion under high temperature or pressure. It is a component of smog and contributes to pollution problems such as poor visibility, decreased lung function, and acid rain.
- **Sulfur dioxide** is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. It irritates the respiratory tract, and can injure lung tissue when combined with fine particulate matter.
- **Particulate matter** is the term used for a mixture of solid particles and liquid droplets found in the air. Particles up to 10 microns in diameter are referred to as PM_{10}, while fine particles less than 2.5 microns in diameter are called $PM_{2.5}$. Particulates can be directly emitted through fuel combustion, or they may be formed by blowing soil, smoke, chemical reactions, deteriorating tires, and other sources. Particulates can transport carcinogens and other toxic compounds, reduce lung function and aggravate respiratory and cardio-vascular diseases.
- **Toxic Air Contaminants (TACs)** refer to a group of pollutants that are harmful in small quantities, such as benzene, formaldehyde, and hydrogen sulfide. Because diesel fuel engines are a potential source, new development near freeways may require filtration systems to reduce potential exposure.

One approach to reducing air pollution is to shift to cleaner fuels and more fuel-efficient vehicles. A complementary approach is to encourage land use and transportation patterns that are less dependent on automobiles. Adopting policies that enable residents to live closer to work—or work closer to home—can reduce total vehicle miles traveled, which can also have a positive air quality impact. Air quality strategies also address other potential sources of pollution, including construction and demolition activities, quarry operations, and the use of paints and solvents.

Policy C-2.1: State and Federal Air Quality Standards

Continue to comply with state and federal air quality standards.

> ***Program C-2.1A: Cooperation with Other Agencies.*** *Work with the Bay Area Air Quality Management District (BAAQMD) and other agencies to ensure compliance with air quality regulations and proactively address air quality issues.*

Policy C-2.2: Land Use Compatibility and Building Standards

Consider air quality conditions and the potential for adverse health impacts when making land use and development decisions. Buffering, landscaping, setback standards, filters, insulation and sealing, home HVAC measures, and similar measures should be used to minimize future health hazards.

> ***Program C-2.2A: Protection of Sensitive Receptors.*** *Use the development review process to require adequate buffering when a sensitive receptor (a use with occupants sensitive to the effects of air pollutants, such as children and the elderly) is proposed near an existing source of toxic contaminants or odors. For proposed sensitive receptors within 500 feet of Highway 101 or Interstate 580, an analysis of mobile source toxic air contaminant health risks should be performed. The analysis should evaluate the adequacy of the setback from the highway and, if necessary, identify design mitigation measures and building standards to reduce health risks to acceptable levels. Mitigation standards and requirements should be periodically updated as air quality conditions and pollution control technology change.*
>
> ***Program C-2.2B: New Sources of Air Pollution.*** *Use the development review process to ensure that potential new local sources of air pollution or odors provide adequate buffering and other measures necessary to comply with health standards.*
>
> *See also Goal EDI-2 for additional policies and programs on reducing air pollution exposure. See the Noise Element for additional policies on reducing exposure to transportation noise sources.*

Policy C-2.3: Improving Air Quality Through Land Use and Transportation Choices

Recognize the air quality benefits of reducing dependency on gasoline-powered vehicles. Implement land use and transportation policies, supportable by objective data, to reduce the number and length of car trips, improve alternatives to driving, and support the shift to electric and cleaner-fuel vehicles.

> ***Program C-2.3A: Air Pollution Reduction Measures.*** *Implement air pollution reduction measures as recommended by BAAQMD's Clean Air Plan and supporting documents to address local sources of air pollution in community planning. This should include Transportation Control Measures (TCM) and Transportation Demand Management (TDM) programs to reduce emissions associated with diesel and gasoline-powered vehicles.*
>
> *See the Mobility Element for additional policies and programs to reduce emissions*

Photo Credit: Florian Kainz

Wildfire Smoke

As California experiences more frequent and catastrophic wildfires, wildfire smoke has become an ongoing health threat The principal hazard is inhalation of particulate matter. Effects can range from eye and respiratory tract irritation to more serious effects, including reduced lung function, pulmonary inflammation, bronchitis, exacerbation of asthma and other lung diseases, cardiovascular events, and even premature death. Strategies to reduce exposure involve staying indoors, limiting physical activity, and using air filtration systems. Not all households have the resources to shelter in place, making it important to also have "clean air" shelters that provide relief.

Policy C-2.4: Particulate Matter Pollution Reduction

Promote the reduction of particulate matter from roads, parking lots, construction sites, agricultural lands, wildfires, and other sources.

***Program C-2.4A: Particulate Matter Exposure**. Through development review, require that Best Available Control Technology (BACT) measures (such as setbacks, landscaping, paving, soil and dust management, and parking lot street sweeping) are used to protect sensitive receptors from particulate matter. This should include control of construction-related dust and truck emissions as well as long-term impacts associated with project operations. Where appropriate, health risk assessments may be required to evaluate risks and determine appropriate mitigation measures.*

***Program C-2.4B: Wildfire Smoke.** Support efforts to reduce health hazards from wildfire smoke, such as limits on outdoor activities, access to respirators and air filtration systems, access to clean air refuge centers, and public education.*

***Program C-2.4C: Wood-Burning Stoves and Fireplaces.** Regulate wood-burning stoves and fireplaces to reduce particulate pollution.*

See also Policy C-1.16 regarding the role of trees in enhancing air quality and promoting health

Policy C-2.5: Indoor Air Pollutants

Reduce exposure to indoor air pollutants such as mold, lead, and asbestos through the application of state building standards, code enforcement activities, education, and remediation measures.

Policy C-2.6: Education and Outreach

Support public education regarding air pollution prevention and mitigation.

***Program C-2.6A: Air Quality Education Programs**. Actively participate in the air quality education programs of the BAAQMD. Use social media and other means of outreach to alert residents of Spare the Air days and associated recommendations.*

***Program C-2.6B: Equipment and Generators.** Encourage the use of non-gasoline powered leaf blowers and other yard maintenance equipment, as well as clean-powered generators.*

See also Policy LU-1.3 on transit-oriented development

Water Quality

Goal C-3: Clean Water

Improve water quality by reducing pollution from urban runoff and other sources, restoring creeks and natural hydrologic features, and conserving water resources.

Water is vital to sustain life. San Rafael will preserve the quality of its surface and groundwater resources by managing urban runoff, implementing pollution controls, supporting public education and awareness, and working with partner agencies to meet state and federal water quality standards. The City will also actively work to reduce overall water demand, particularly as the region is challenged by drought and the impacts of climate change.

Water has always been a precious resource in California. It must be conserved to meet day-to-day needs, and it must be carefully managed to reduce water pollution and sustain life and environmental health.

Potable water, or drinking water, is provided by the Marin Municipal Water District (MMWD). MMWD relies on sources within Marin County and water imported from the Russian River for domestic and commercial consumption, as well as for fire protection and irrigation of landscaping. Reuse and conservation of water helps provide a reliable source and reduces the need and cost of securing out-of-area supplies. Examples of conservation measures include low-flow toilets and showerheads, irrigation system timers and monitors, and water-efficient dishwashers and washing machines. Wastewater also can be recycled or "reclaimed" for use in irrigation, car washes, industry, and even domestic consumption.

Climate change makes it more imperative than ever to conserve water and explore more sustainable water sources. In 2011, San Rafael adopted water-efficient landscaping standards, with enforcement and monitoring responsibilities assigned to MMWD. MMWD also provides education and programming to encourage more efficient water use and reduce waste. This includes support for rainwater collection systems and allowances for graywater systems that recapture water from sinks, showers, tubs, and washing machines for other uses.

Effective water management also requires consideration of our groundwater basins. Groundwater use is currently limited to small domestic wells. While groundwater is not currently or planned to be used for municipal supply, it remains important to monitor and protect this resource. Groundwater is susceptible to saltwater intrusion, contamination from leaking underground tanks, and other hazards that could potentially impact surface waters.

Most of the water-related policies and programs below focus on reducing pollution from "non-point" sources of pollution, sometimes referred to as urban runoff. While "point" sources of pollution such as wastewater treatment plants have been regulated for many decades, "non-point" sources are more diffuse and require special measures. Rainfall can transport oil and grease from parking lots into local streams, pesticides and animal waste from our yards into storm drains, and roadside trash into the Bay. These materials can obstruct water flow, raise water temperatures, and kill aquatic species.

The San Francisco Bay Regional Water Quality Control Board has identified San Rafael Creek as an impaired waterway due to Diazinon (an insecticide). San Francisco Bay has also been impaired by a number of chemicals and compounds, including mercury and PCBs. Once a waterbody is listed as impaired, states are required to develop thresholds for the pollutants causing impairment, as well as plans for restoring acceptable water quality standards.

San Rafael is a member of the Marin County Stormwater Pollution Prevention Program (MCSTOPPP), which was created in 1993 to prevent stormwater pollution, protect water quality in creeks and wetlands, preserve the beneficial uses of local waterways, and support compliance with state and federal water quality regulations. Their programs encourage education, monitoring, local permitting (including erosion and sediment control plans), and elimination of illegal discharges. At the local level, the City supports best practices to reduce water pollution, including on-site retention of stormwater, bio-retention facilities, permeable pavement use, local creek clean-up programs, street sweeping, and similar measures.

Policy C-3.1: Water Quality Standards

Continue to comply with local, state and federal water quality standards.

***Program C-3.2A: Interagency Coordination**. Coordinate with the local, state, and federal agencies responsible for permitting discharges to San Rafael's creeks and surface waters, monitoring water quality, and enforcing adopted water quality standards and laws.*

See also Policy CSI-4.9 on wastewater treatment

Policy C-3.2: Reduce Pollution from Urban Runoff

Require Best Management Practices (BMPs) to reduce pollutants discharged to storm drains and waterways. Typical BMPs include reducing impervious surface coverage, requiring site plans that minimize grading and disturbance of creeks and natural drainage patterns, and using vegetation and bioswales to absorb and filter runoff.

***Program C-3.2A: Countywide Stormwater Program.** Continue to participate in the countywide stormwater pollution prevention program and comply with its performance standards.*

***Program C-3.2B: Reducing Pollutants in Runoff.** Continue to reduce the discharge of harmful materials to the storm drainage system through inspections, enforcement programs, reduced use of toxic materials, and public education.*

***Program C-3.2C: Construction Impacts.** Continue to incorporate measures for stormwater runoff control, management, and inspections in construction projects and require contractors to comply with accepted pollution prevention planning practices. Provisions for post-construction stormwater management also should be included.*

***Program C-3.2D: System Improvements.** Improve storm drainage performance through regular maintenance and clean-out of catch basins, a City street sweeping program, and prioritizing Trash Reduction Implementation Plan measures, including installation of trash capture devices, . When existing drainage lines are replaced, design changes should be made as needed to increase capacity to handle intensifying storms and expected sea level rise impacts.*

***Program C-3.2E: Pesticide and Fertilizer Management**. On City property, reduce or eliminate the use of toxic pesticides and fertilizers. Ensure that the application of pesticides follows all applicable rules and regulations and is performed through a transparent process in which the public receives early notification.*

See also Program C-1.14B on Integrated Pest Management

Program C-3.2F: Monitoring. *Support ongoing water quality testing in San Rafael's creeks and waterways to evaluate the effectiveness of existing programs and determine where additional pollution control measures may be needed.*

Policy C-3.3: Low Impact Development

Encourage construction and design methods that retain stormwater on-site and reduce runoff to storm drains and creeks.

Program C-3.3A: Development Review. *Provide guidance to developers, contractors and builders on the use of rain gardens, bioswales and bioretention facilities, permeable pavers, grass parking lots, and other measures to absorb stormwater and reduce runoff rates and volumes.*

Program C-3.3B: Non-Traditional Gardens. *Evaluate best practices in the use of roof gardens, vertical gardens/ green walls, pollinator gardens and other measures that increase the City's capacity to sequester carbon, plant trees, and enhance environmental quality. Encourage the incorporation of such features in new development.*

Reducing Trash in Our Waterways

San Rafael is implementing a number of programs to reduce trash in local waterways. These include the state-mandated ban on single use (plastic) bags and a local ban on Styrofoam containers for retail food vendors. In 2017, the City launched "Ask First," a pilot program designed to reduce unnecessary waste restaurants. Participating businesses simply ask customers if they would like utensils and napkins before including them with an order.

See also Safety and Resilience Element Program S-1.9C on erosion control

Policy C-3.4: Green Streets

Design streets and infrastructure so they are more compatible with the natural environment, mitigate urban heat island effects, and have fewer negative impacts on air and water quality, flooding, climate, and natural habitat.

Program C-3.4A: Green Streets Planning. *Develop a Green Streets Plan that includes policy guidance, tools, analytics, and funding mechanisms to create more sustainably designed street and storm d rainage systems. Street and drainage system improvements should support City conservation and climate change goals.*

Program C-3.4B: Funding. *Identify and apply for grants and federal, state, and regional funds to upgrade stormwater facilities, rehabilitate roads, and implement other Green Streets initiatives.*

See the Infrastructure Element for additional policies and programs on green infrastructure

Policy C-3.5: Groundwater Protection

Protect San Rafael's groundwater from the adverse effects of urban uses and impacts from sea level rise. Encourage opportunities for groundwater recharge to reduce subsidence and water loss, and support water-dependent ecosystems.

Program C-3.5A: Underground Tank Remediation
Continue efforts to remediate underground storage tanks and related groundwater hazards. Avoid siting new tanks in areas where they may pose hazards, including areas prone to sea level rise.

Policy C-3.6: Nearshore Waters

Ensure the protection of Canal and Bay water quality from the potential adverse effects of boats, live-aboards, harbors, and other marine facilities and activities.

Program C-3.6A: Water Quality Improvements. *Collaborate with the Bay Conservation and Development Commission, State and Regional Water Quality Control Boards, and other agencies to support water quality improvement efforts and the removal of plastics and other trash from the Canal and Bay. Seek funding from organizations such as the San Francisco Bay Restoration Authority for projects that reduce urban runoff.*

Program C-3.6B Boat Sanitation and Enforcement. *Require consistent enforcement and inspection of sanitation facilities in boats berthed in the San Rafael Canal and elsewhere in Bay waters within the City limits.*

Program C-3.6C: Sewage Pump Out Facilities*. Support marina owners in providing on-site sewage pump-out facilities. Require marinas to install such facilities when improvements are made.*

Program C-3.6D: Education of Boaters*. Educate boaters about good sanitation practices and measures to reduce invasive species with the potential to harm marine and freshwater life.*

Policy C-3.7: Education and Outreach

Promote greater public awareness of the causes and effects of water pollution and how to reduce it.

Program C-3.7A: Stenciling of Storm Drains*. Continue to stencil storm drains and use other forms of signage and art so that people understand the consequences of pollutant runoff and its impacts on the Bay.*

Program C-3.7B Outreach. *Support and participate in efforts by the Marin County Stormwater Pollution Prevention Program to raise awareness of the effects of water pollution and ways the public can help improve water quality.*

Program C-3.8A: Water Conservation Programs. *Work with Marin Municipal Water District and other organizations to promote water conservation programs and incentives and ensure compliance with state and MMWD regulations, including the provisions of the Urban Water Management Plan (see Policy CSI-4.8 for additional guidance).*

Program C-3.8B: Public Education. *Continue and expand programs to educate residents and businesses about the benefits of water conservation and requirements for plumbing fixtures and landscaping.*

Program C-3.8C: Reclaimed Water Use. *Support the extension of recycled water distribution infrastructure by Las Gallinas Valley Sanitary and MMWD, along with programs to make the use of recycled water more feasible (see Policy CSI-4.12 for additional guidance).*

Program C-3.8D: Graywater and Rainwater. *Encourage the installation of graywater and rainwater collection systems. Explore revisions to building codes that would facilitate such projects where obstacles currently exist.*

Program C-3.8E: Reducing Municipal Water Use. *Reduce water use for municipal operations through water-efficient landscaping, maintenance of irrigation equipment, replacement of inefficient plumbing fixtures, and using recycled water where available and practical.*

Policy C-3.9: Water-Efficient Landscaping

Encourage the use of vegetation and water-efficient landscaping that is naturalized to the San Francisco Bay region and compatible with fire-prevention and climate resilience goals.

Program C-3.9A: Demonstration Gardens. *Maintain the Falkirk demonstration gardens illustrating xeriscaping principles and drought-tolerant plant materials.*

See also Policy C-1.15 on landscaping

Falkirk Demonstration Garden, San Rafael

Climate Change

The global mean temperature of our planet is warming at a rate that cannot be explained by natural causes alone. Human activities—especially deforestation and fossil fuel combustion—are directly altering the chemical composition of the atmosphere. In the past, gradual changes in temperature changed the distribution of species over long periods of time. These changes have accelerated to the point that they are occurring not in geologic time frames but in a human lifetime.

In California, statewide average temperatures have increased by 2 degrees since the early 20th Century. The state has seen warmer winters and springs, decreases in mountain snow accumulations, earlier snowmelt, earlier spring flower blooms, and less precipitation overall. By 2100, average temperatures could increase by up to 8.8 degrees depending on greenhouse gas emission reduction strategies.

The environmental consequences of a warming planet will depend on the way we respond in the coming decades. Even if immediate actions are taken, some impacts are now considered unavoidable. Among them are a continued decline in water resources, higher wildfire risks, increased sea level rise, more extreme heat events and more severe storms. These changes could affect food production, energy pricing and demand, public health, and the future of many cities and towns.

In the context of the General Plan, climate-related policies fall into two general categories: mitigation and adaptation. Mitigation policies address the root causes of climate change. These policies focus on the ways San Rafael can reduce greenhouse gas (GHG) emissions, which are the pollutants that cause climate change. Adaptation policies address the effects of climate change. These policies focus on ways to make the city more resilient and better prepared to address sea level rise, wildfires, and other impacts. Adaptation policies are principally in the Safety and Resilience Element, but also appear in other elements such as Land Use and Mobility.

Climate Change and Sustainability

Climate change policies are closely aligned with the concept of sustainability. The former is focused on reducing greenhouse gases, while the latter is focused on providing stewardship of shared natural resources. Sustainability is defined as meeting the community's present needs without compromising its ability to do the same for future generations. It is based on three foundational pillars:

- Living harmoniously with the environment—protecting, restoring, managing, and conserving our land, water, air, and biological resources.
- An economy that meets the needs of its residents, with environmentally responsible businesses that have local roots, give back to their communities, and create value for everyone
- Achieving social equity by providing access to services, transportation, education, jobs, housing, and recreation to all residents, creating a just and fair society in which all can participate, prosper, and reach their full potential.

Strategies to live and grow more sustainability are complementary with those addressing climate. Both strive to conserve non-renewable resources and reduce waste. Both involve a decision-making process that looks at the long-term consequences of our actions. Both recognize that living in harmony with the environment also has social and economic dimensions. For example, a healthy economy may provide many jobs, but jobs filled by employees who commute to work alone from outlying areas creates negative consequences for the environment and society in the form of increased fuel consumption, traffic congestion, and degradation of air quality.

Climate Change Action Plan (CCAP)

In 2006, California legislators signed into law AB32 and SB375, complementary plans to reduce GHG emissions to 1990 levels from 'business-as-usual' levels by 2020, a roughly 30% overall reduction. These targets are supplemented by Executive Orders from the Governor's Office in 2005 and 2015, including reducing GHG emissions to 80 percent below 1990 levels by 2050 (S-3-05) and 40 percent below 1990 levels by 2030 (B-30-15).

Recognizing the magnitude of these goals and the importance of local action to achieve them, the City of San Rafael began studying GHG emission sources in 2008. Three major GHG contributors were identified—transportation, buildings, and waste disposal. In 2009, the City adopted its first Climate Change Action Plan (CCAP). It included the ambitious target of reducing GHG emissions 25% from 2005 levels by 2020, exceeding the target set by the state. San Rafael met this target and implemented 40 of the 48 measures in the 2009 CCAP.

The CCAP was updated in 2019 to move the horizon to 2030 and update targets for the coming decade. The Plan includes a variety of regulatory, incentive-based, and voluntary strategies, some of which are already in place and others of which are new. State actions—particularly light and heavy-duty vehicle regulations and new energy-efficiency construction standards—will have a substantial impact on future emissions. Local strategies will supplement these actions, resulting in a preliminary estimate of a 42 percent reduction in GHG emissions by 2030 relative to a 1990 baseline. Local actions represent more than half of the anticipated reduction.

Implementing the CCAP is a dynamic process, involving regular monitoring, objective review, community input, and collaboration. The City has developed a set of indicators that can be tracked year over year to determine how successful its efforts are. The use of easily understood, realistic, measurable indicators is essential to ensure that climate-related programs are achieving their intended outcomes, and to make adjustments over time. The 2019 CCAP includes estimates of the metric tons of greenhouse gases that will be removed from the atmosphere if each measure in the Plan is carried out. As indicated in Table 6-2, local strategies are organized in eight categories, which collectively will reduce emissions by nearly 100,000 metric tons of greenhouse gases a year by 2030.

Drawdown: Marin is a countywide community campaign to reduce greenhouse gas emissions and prepare for climate change impacts. The effort is aligned with Project Drawdown, a global research organization that identifies reviews, and analyzes the most viable solutions to climate change. Drawdown: Marin is working to reduce—or "draw down"—carbon emissions by designing and implementing solutions in six focus areas:

- Renewable Energy
- Transportation
- Buildings + Infrastructure
- Carbon Sequestration
- Local Food + Food Waste
- Climate Resilient Communities

A Drawdown: Marin Strategic Plan includes 29 local climate change solutions, including seven identified for immediate implementation. These include a campaign promoting zero-emission vehicles, development of community resilience hubs in the Canal area, a Resilient Neighborhoods program, and others.

Table 6-2: Impact of Local Emission Reduction Strategies

Strategy Category	GHG Reductions by 2030 ($MTCO_2e$)*	% of Reductions
Low Carbon Transportation	37,030	38%
Energy Efficiency	18,280	19%
Renewable Energy	31,925	33%
Waste Reduction	10,025	10%
Water Conservation	830	1%
Sequestration and Adaptation	n/a	n/a
Community Engagement	n/a	n/a
Implementation and Monitoring	n/a	n/a
TOTAL	**98,085**	**100.0%**

• - Metric Tons of Carbon Dioxide Equivalent. This is used to measure the amount of GHGs in terms an equivalent amount of CO_2 that would cause the same amount of warming.
Source: 2019 Climate Change Action Plan, City of San Rafael

Policies under Goals C-4 and C-5 address different aspects of San Rafael's Climate Action strategy. Goal C-4 specifically relates to energy conservation and the use of renewable energy resources. Energy-related measures account for roughly half of the emission reduction to be accomplished through local climate action strategies. Goal C-4 also considers the other environmental benefits associated with reduced dependence on fossil fuels, and the potential economic and social benefits to residents and businesses.

Goal C-5 looks more broadly at climate action planning in San Rafael, providing a framework for implementation of the CCAP.

Photo Credit: Fabrice Florin

Goal C-4: Sustainable Energy Management

Use energy in a way that protects the environment, addresses climate change, and conserves natural resources.

San Rafael will use energy resources sustainably by shifting to renewable energy sources and reducing demand. Energy will also be conserved through the ways we live, work, build, and travel.

Even before the link to climate change was widely recognized, San Rafael encouraged more efficient use of energy resources. Fossil fuels like oil and gas are a finite resource, and their extraction, transport, and combustion has had significant impacts on our environment. Energy shortages in the 1970s and 80s impacted the national and global economies and changed the way we view transportation, construction, heating, and cooling. Energy reliability continues to be an issue today, as we face power shutoffs, rolling blackouts, and unpredictable fuel costs. There continues to be a need for greater energy independence and self-sufficiency.

Increasing the efficiency of buildings is often the most cost-effective and practical approach to conserving energy and reducing related emissions. Basic upgrades such as adding insulation and sealing heating ducts can reduce energy consumption by 20 percent. A variety of measures such as high-efficiency hearing and air conditioning, replacing windows and light bulbs, programmable timers, and many more, are available. The City participates in programs that help lower income households cover these costs, since they may be expensive.

In new construction, a variety of building code requirements, generally referred to as "green building" measures, result in increased energy efficiency (see text box on Title 24). The State's goals are to have all new residential construction be "zero net" electricity by 2020, with non-residential construction following by 2030. A zero net energy building consumes no more energy than what is generated on-site, or off-site from renewable sources.

Like most of California, San Rafael is moving toward renewable energy sources, such as solar, wind, geothermal, and hydroelectric power. Solar energy is viable on most building rooftops in the city and could conceivably generate enough electricity to power the entire city. The Climate Change Action Plan projects that 24 percent of San Rafael's electricity can come from local solar energy systems by 2030, up from about four percent today. Renewable energy can also be purchased through MCE Clean Energy and PG&E, both of which are working toward fully renewable portfolios.

Policy C-4.1: Renewable Energy

Support increased use of renewable energy and remove obstacles to its use.

> ***Program C-4.1A: Marin Clean Energy Targets.*** *Support Marin Clean Energy (MCE) efforts to reach the goal of providing energy that is 100 percent GHG free by 2025.*
>
> ***Program C-4.1B: PACE Financing.*** *Participate in a Property Assessed Clean Energy (PACE) financing program to fund installation of renewable energy systems, energy efficiency upgrades to existing buildings, and other improvements such as electric vehicle chargers and battery storage. Consider other funding sources to improve local energy generation and storage.*
>
> ***Program C-4.1C: Regulatory Barriers.*** *Continue efforts to remove regulatory barriers and provide creative incentives for solar energy installations, such as rooftop solar systems and parking lot canopies. The installation of renewable energy systems that are consistent with the Climate Change Action Plan should be encouraged and accelerated.*

Title 24

In 1978, California adopted new energy efficiency standards commonly referred to as Title 24. The standards are periodically updated to incorporate new energy efficiency technologies and methods. As a result of Title 24 standards, homes built within the last decade are 4.5 times more energy efficient per square foot than homes built prior to 1960. Census data indicates that 60 percent of San Rafael's housing units were constructed prior to 1970. Many of these buildings have inefficient heating, ventilation, cooling, and lighting systems. A high level of energy savings will be achieved in the future through retrofit and energy efficiency projects.

Program C-4.1D: Reducing Natural Gas Use. *Promote electrification of building systems and appliances in new buildings and those that currently use natural gas.*

Program C-4.1E: Municipal Buildings. *Wherever feasible, incorporate renewable energy technology such as solar, cogeneration, and fuel cells, in the construction or retrofitting of City facilities. Continue use of MCE Deep Green (100% renewable) power.*

Policy C-4.2: Energy Conservation

Support construction methods, building materials, and home improvements that improve energy efficiency in existing and new construction.

Program C-4.2A: Energy Efficiency Outreach. *Continue to inform businesses and residents of programs and rebates to conserve energy and weatherize their homes.*

Program C-4.2B: Green Building Standards. *Implement State green building and energy efficiency standards for remodeling projects and new construction. Consider additional measures to incentivize green building practices, low carbon concrete, and sustainable design.*

Program C-4.2C: Energy Efficiency Incentives. *Provide financial incentives, technical assistance, streamlined permitting processes, and partnerships to encourage energy-efficiency upgrades in new and existing buildings. Typical improvements include the use of energy-efficient windows, lighting, and appliances, induction and convection cooking, insulation of roofs and exterior walls, higher-efficiency heating and air conditioning (including electrical heat pump systems), and other projects that lower electricity and natural gas consumption.*

Program C-4.2D: Time-of-Sale Energy Audits. *Consider requiring energy audits for residential and commercial buildings prior to property sales, including identification of cost savings from energy efficiency measures and potential rebates and financing options. An energy audit is a property inspection that identifies opportunities to improve energy efficiency.*

Program C-4.2E: Cool Roofs and Pavement. *Encourage the use of materials that minimize heat gain on outdoor surfaces such as parking lots, roadways, roofs and sidewalks.*

Policy C-4.3: Managing Energy Demand

Reduce peak demands on the electric power grid through development of local sources, use of battery storage, deployment of "smart" energy and grid systems that use technology to manage energy more efficiently, and public education.

> ***Program C-4.3A: Innovative Technologies****. Apply innovative technologies such as micro-grids, battery storage, and demand response programs that improve the electric grid's resilience and meet demand during high use periods. Encourage emergency battery back-up for power outages in lieu of generators.*
>
> *See also Policy CSI-4.13 on energy infrastructure*

Policy C-4.4: Sustainable Building Materials

Encourage the use of building materials that reduce environmental impacts and the consumption of non-renewable resources.

> ***Program C-4.4A: Use of Alternative Building Materials.*** *Evaluate opportunities to amend the City's building codes and zoning ordinances to allow the use of acceptable resource-efficient alternative building materials and methods.*

Policy C-4.5: Resource Efficiency in Site Development

Encourage site planning and development practices that reduce energy demand and incorporate resource- and energy-efficient infrastructure.

> ***Program C-4.5A: Solar Site Planning.*** *Use the development review process to:*
> *a) Encourage opportunities for passive solar building design and the use of photo-voltaic materials and devices.*
> *b) Review proposed site design for energy efficiency, such as shading of parking lots and summertime shading of south-facing windows.*
>
> ***Program C-4.5B: Solar Access Ordinance.*** *Consider developing a solar access ordinance to protect solar access rights and prevent restrictions on solar energy systems. The ordinance should address potential impacts related to development or modification of existing structures on neighboring properties.*

"Micro-Grids" in a Nutshell

A microgrid is a self-sufficient energy system that serves a discrete geographic footprint, such as a college campus, hospital complex, business center, or neighborhood (MicrogridKnowledge.com). Within each microgrid are one or more kinds of distributed energy, such as solar panels or wind turbines, that produce power. Many newer microgrids include energy storage, typically from batteries. A microgrid has three defining characteristics. First, it is local---it generates power close to those who use it. Second, it is independent. A microgrid can disconnect from "the grid" and operate on its own if it needs to. Third, a microgrid is intelligent. Its generators, batteries, and building systems are computer-managed with a high degree of sophistication. Microgrids have been around for decades, but their numbers are growing fast. The pace of installation is expected to grow dramatically as distributed energy prices drop and disruption of the power grid becomes a greater concern.

Goal C-5: Reduced Greenhouse Gas Emissions

Achieve a 40 percent reduction in 1990 greenhouse gas emission levels by 2030 and a 60 percent reduction by 2040.

The City of San Rafael will implement the measures outlined in this General Plan and in its Climate Change Action Plan to reduce greenhouse gas (GHG) emissions, which are the leading cause of global climate change. The City will also work to achieve the longer-term State goal of achieving an 80 percent reduction in 1990 GHGs by 2050, pursuing more aggressive measures as they become technologically and financially viable.

In 2019, the equivalent of 598,500 metric tons of carbon dioxide was emitted to the atmosphere from activities in the San Rafael Planning Area. Chart 6.1 indicates the sources of these emissions. Transportation represented about 71 percent of the total, while natural gas and electric use represented 24 percent. Much of the decline achieved in the last decade has been in the energy sector, thanks to energy efficiency measures and the growing use of renewables. Declines in the transportation sector have been harder to achieve, in part due to continued long commutes and traffic congestion.

Reducing the share of emissions from transportation will require more than just switching to electric vehicles. It will require land use and housing strategies that enable people to live closer to work, along with transportation strategies that provide viable alternatives to driving. Much of General Plan 2040 is focused on this outcome.

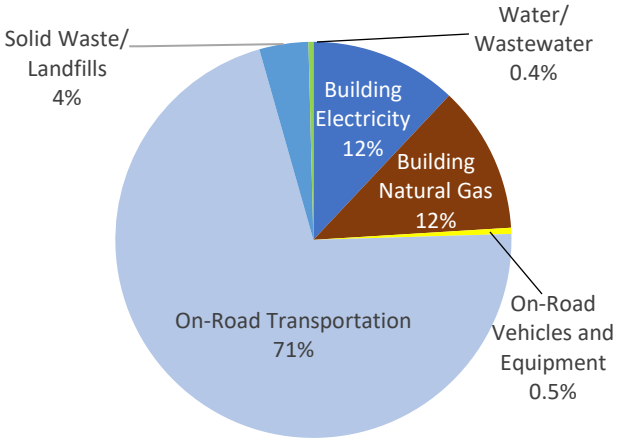
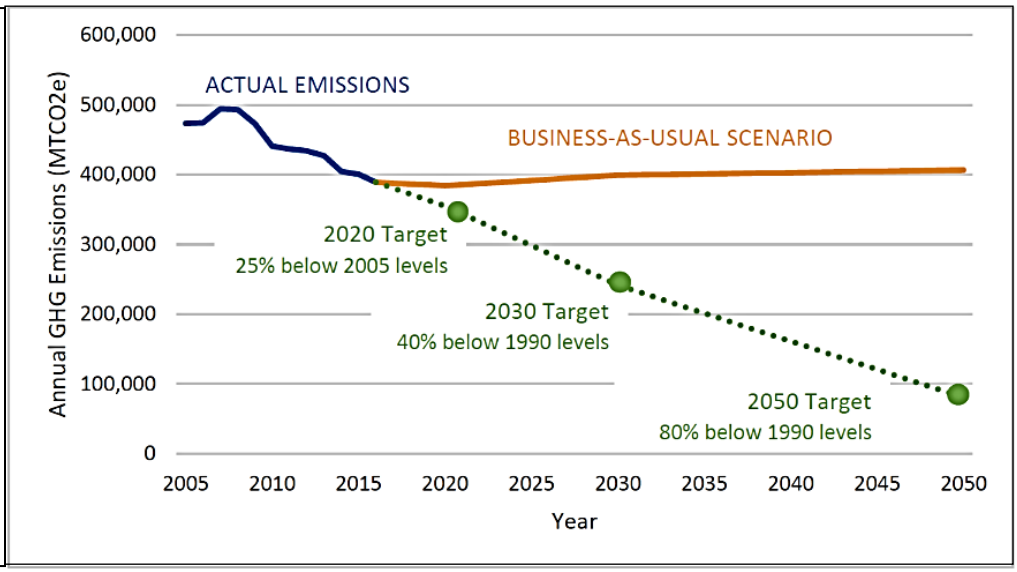


Chart 6-1: Sources of GHG Emissions in San Rafael, 2019

Chart 6-2: Emission Trends, Forecasts, and Targets



Source: San Rafael Climate Change Action Plan, 2019

The Climate Change "Crosswalk" on the next page provides a guide to climate policies integrated throughout the Plan. The most impactful policies are those in the Land Use and Mobility Elements, particularly those dealing with clean fuels, transit improvements, transit-oriented development, and active transportation (e.g., bicycle and pedestrian improvements). The policies below focus more specifically on implementation of the Climate Action Plan, including climate advocacy, municipal programs to reduce emissions, and public education.

Policy C-5.1: Climate Change Action Plan

Maintain and periodically update a Climate Change Action Plan that includes programs to reduce greenhouse gas emissions and metrics for monitoring success.

Program C-5.1A: Progress Reports. *Prepare annual Climate Change Action Plan progress reports, including a list of priority actions. Local climate goals should align with regional goals, including those set through Drawdown Marin.*

Program C-5.1B: Quarterly Forum. *Continue to hold the Climate Change Action Plan (CCAP) Quarterly Forum, which provides oversight on the implementation progress of sustainability and GHG reduction programs.*

Program C-5.1C: Funding*. Identify funding sources for recommended actions, and pursue local, regional, state, and federal grants. Investigate creation of a local carbon fund or other permanent source of revenue.*

Policy C-5.2: Consider Climate Change Impacts

Ensure that decisions regarding future development, capital projects, and resource management are consistent with San Rafael's Climate Change Action Plan and other climate goals, including greenhouse gas reduction and adaptation.

Policy C-5.3: Advocacy

Support and advocate for state and federal legislation and initiatives to reduce GHG emissions.

Program C-5.3A: Local Government Agency Involvement. *Continue to provide a leadership role with other local governmental agencies to share best practices and successes.*

Program C-5.3B: State and Federal Action. *Recommend and support State and federal actions to update renewable energy portfolio standards, amend state building codes, and modify motor vehicle standards to reduce GHG emissions and achieve climate goals.*

Program C-5.3C: Regional Collaboration. *Participate in regional collaborations among public agencies to enact and support new programs or shared improvements which promote or utilize renewable energy sources or reduce energy demand.*

Climate Change Crosswalk

Effectively responding to climate change is a guiding principle of General Plan 2040. The policies and programs under Goal C-5 focus on how climate change can be operationalized as part of City decisions. Other parts of the General Plan address ways the City will address climate change through its land use, transportation, housing, safety, infrastructure, and economic development choices. A summary of climate-related policies in General Plan 2040 is provided below:

Land Use Element

The General Plan Land Use Map places higher density uses near transit stations and in areas that are less auto-dependent. This is supported by Policy LU-1.3, which strives to reduce GHG emissions through the way we design and locate new housing, offices, public buildings, and other uses. Policies also encourage walkable neighborhoods close to retail and services.

Mobility Element

Because transportation is the leading source of GHG emissions in San Rafael, many of the climate-related measures in this Plan appear in the Mobility Element. Goal M-3 includes a series of policies to reduce vehicle miles traveled (VMT) by encouraging carpooling, working from home, flextime, micro-mobility (e-bikes, e-scooters), and similar strategies. Policies support a continued shift to cleaner fuel vehicles and more electric charging stations. Goal M-4 supports a more robust public transit system, to make it easier to travel without a car. Goal M-6 supports pedestrian and bicycle improvements, making it safer and easier to walk or cycle around the city. Collectively, these programs will have the greatest measurable impacts on moving the City toward its GHG reduction targets.

Housing Element

The Housing Element supports energy conservation and green building programs, as well as a shift to renewable energy sources and compact homes in walkable neighborhoods.

Safety and Resilience Element

The Safety and Resilience Element focuses on adaptation to climate change, especially sea level rise and increased fire hazards.

Infrastructure Element

Solid waste management policies address the greenhouse gases generated by landfilled waste, while also promoting reduced natural resource depletion through recycling. Policies also support greener infrastructure, sewage treatment facilities that promote resource reuse, energy micro-grids, reduced emissions associated with water delivery and wastewater collection and treatment, and increased carbon sequestration in the design of streets and drainage systems.

Other Elements

Other policies supporting climate change goals include

- Policy CD-3.5 recognizes the role of street trees and landscaping in absorbing and sequestering carbon
- Policy EV-1.8, which supports more sustainable business practices and growth in “green” jobs and green business practices
- Policy PROS-1.3, which recognizes the importance of open space in sequestering carbon
- Policy EDI-2.8, which supports local food production and urban agriculture (reducing food transportation)
- Policy EDI-2.9, which recognizes the disproportionate impacts of climate change on lower income households.

Photo Credit: Fabrice Florin

Policy C-5.4: Municipal Programs

Implement and publicize municipal programs to demonstrate the City's commitment to sustainability efforts and reducing greenhouse gases.

> ***Program C-5.4A: Low Carbon Municipal Vehicles.*** *As finances allow, continue to shift the City's vehicle fleet to zero emission vehicles and use low carbon fuels as an interim measure until gasoline-powered vehicles are replaced.*
>
> ***Program C-5.4B: Advancing GHG and Sustainability Efforts.*** *Monitor best practices in sustainability and the transition to GHG-free energy sources and evaluate the feasibility of applying such measures at the local level.*

Policy C-5.5: Carbon Sequestration

Enhance the ability of the City's natural and built environment to sequester (absorb and store) carbon emissions.

See Policy C-1.16 on urban forestry and Policies C-4.2 and C-4.4 (green building) for programs

Policy C-5.6: Unintended Consequences

Ensure that climate action measures minimize the potential for unintended consequences, particularly impacts that disproportionately impact lower income communities or drive up the cost of doing business in San Rafael. The City should ensure that the social and financial cost of its regulations are in balance with the benefits, and also consider the ultimate costs of failing to act.

The City is committed to balancing climate-related goals with the goal of being an equitable, just city that strives for a more prosperous future for all residents. It is committed to measures that do not deter innovation or place a disproportionate burden on small local businesses. Finally, it is committed to solutions which maximize GHG reduction benefits relative to cost, and decision-making informed by a careful analysis of financial feasibility.

See the EDI Element for additional policy guidance on achieving equitable outcomes as policies and programs are implemented

Policy C-5.7: Climate Change Education

Continue community education and engagement in climate and sustainability efforts.

***Program C-5.7A: Public Outreach Campaign**. As recommended by the Climate Change Action Plan, implement a communitywide public outreach and behavior change campaign to engage residents, businesses, and consumers around the impacts of climate change and the ways individuals and organizations can reduce their GHG emissions and create a more sustainable, resilient, and healthier community.*

***Program C-5.7B: Resilient Neighborhoods.** Continue participating in the Resilient Neighborhoods program and expand the program to include local businesses (see text box).*

***Program C-5.7C: Financial Incentives.** Continue to raise awareness of savings, rebates and other financial incentives to conserve and recycle.*

***Program C-5.7D: Promote Sustainability Efforts.** Promote sustainability and climate change awareness through education, publications, the City's website, community organizations, and special events such as Earth Day and an annual Green Festival.*

Photo Credit: Sustainable Marin

Resilient Neighborhoods

The purpose of the Resilient Neighborhoods program is to motivate community members to live more sustainably and prepare for climate impacts. The program helps residents reduce greenhouse gas emissions in their homes, businesses, travel modes, and other activities. Participants take part in an initial workshop and then meet several times to learn how they can reduce their carbon footprints.

As of May 2020, there were 453 San Rafael residents (representing 174 households) participating in Resilient Neighborhoods Climate Action Teams. Collectively, their efforts resulted in a reduction of more than 2.14 million pounds of greenhouse gases from the atmosphere!