

EXECUTIVE SUMMARY

The Existing Conditions Report is Part I of the San Lorenzo Valley Water District Watershed Management Plan, which the District's Board of Directors directed staff to prepare in 2006. The Existing Conditions Report updates the District's 1985 watershed protection plan to reflect subsequent changes in the District's land ownership and service area, changes in watershed conditions, advances in watershed science, and changes in regulatory requirements. Some specific changes include:

- The 1996 Safe Drinking Water Act and the Surface Water Treatment Rule increased drinking water standards and began to emphasize the importance of source water protection.
- In 1998, the San Lorenzo River was listed as impaired under the Clean Water Act for sediment.
- In 2002, the sediment Total Maximum Daily Load (TMDL) for the San Lorenzo River was adopted by the Central Coast Regional Water Quality Control Board.
- In 2003, the Office of Administrative Law approved the San Lorenzo River sediment and nitrate TMDLs.
- In 2005, the Central Coast coho salmon was listed as endangered under the federal Endangered Species Act.
- In 2006, the District annexed both the Mañana Woods subdivision and the Felton community into its service area.
- In 2006, California Assembly Bill 32 (AB 32), also known as the "California Global Warming Solutions Act of 2006," became the first law to comprehensively limit greenhouse gas (GHG) emissions at the state level.
- In 2007, the International Panel on Climate Change published its summary report on climate change for policymakers.
- In 2008, the District acquired the Felton water system and 252 acres of watershed land in the Fall Creek watershed.
- In 2008, the District Board approved a resolution on climate change, inventoried its greenhouse gas emissions with the California Climate Action Registry, and sponsored a public forum on climate change and local water resources.
- In 2009, the District had its 2006 and 2007 greenhouse gas inventories certified by the California Climate Action Registry.

This report documents current conditions in the watershed, to the best of staff's ability, and it identifies known information gaps with regards to conditions in the watershed.

ES 1.1. About the SLV Water District

Established in 1941, the San Lorenzo Valley Water District serves approximately 7,400 connections (22,500 people) within the San Lorenzo Valley, in the Santa Cruz Mountains on the Central Coast of California. The District partners with other water agencies in the region to

protect the water supply of the 138 square mile San Lorenzo River watershed. The District's mission statement reflects its interest in protecting its watershed lands:

Our mission is to provide our customers and all future generations with reliable, safe and high quality water at an equitable price; to create and maintain outstanding customer service; to manage and protect the environmental health of the aquifers and watersheds; and, to ensure the fiscal vitality of the San Lorenzo Valley Water District (District website, 2007).

The District's three watershed management goals, defined in its initial 1985 watershed management plan were:

- To maintain and restore surface and groundwater quality consistent with state and federal regulations.
- To maintain and enhance vegetative cover, plant diversity, wildlife habitat, and natural biotic communities.
- To allow recreational uses of watershed lands consistent with a high level of environmental protection (SLVWD, 1985).

ES 1.2 Overview of District lands & water supply

The San Lorenzo River watershed is characterized by steep mountainous headwater areas, a Mediterranean climate, and remarkable biodiversity. Development, logging, mining, and water extraction have all had an impact on the health of the river. The District relies on six surface water sources in the upper watershed, primarily during the wet season, and on several ground water sources, which tap the Santa Margarita Sandstone and the Lompico aquifers, primarily in the dry season. The District owns approximately 1,800 acres serving as watershed for its surface water intakes and wells. The primary land uses that could impact surface water sources include residential development, timber production, vineyards, and recreation. The primary land uses that could impact ground water recharge areas include residential development, equestrian and motorcycle use, quarrying, and timber production. The District has four separate water systems: the Northern, the Southern, Felton, and Mañana Woods. Felton is served by surface and spring water. The Northern system is served by both surface water and groundwater. The Southern system and Mañana Woods are currently served only by groundwater.

ES 1.3 Hydrology, geomorphology & water quality

Both natural processes and human impacts have shaped the San Lorenzo River watershed. The Santa Cruz Mountains were formed and uplifted by shifts of the Pacific Plate against the North American Plate, throughout the millennia. This uplift exposed the ancient marine layer--mostly sedimentary rock--to weathering, erosion, and mass wasting. The fault lines within the watershed created three different geologic regions, with different soil types. The area's steep, rugged topography, coupled with episodic storm events give the watershed a high natural background erosion rate.

Streamflow in the river is directly related to precipitation. Ninety percent of the rainfall occurs from November through April. Averaging approximately 60 inches per year at the crest of Ben Lomond Mountain, rainfall has ranged from 22 inches in 1976-77 to 111 inches in 1982-83.

Winter streamflow increases after the soil is saturated, typically in December through March, spiking after episodic rainfall. Coastal fog also delivers some moisture to the San Lorenzo Valley, but less than other parts of the coast-line, because the high ridgeline of Ben Lomond Mountain tends to block the direct incursion of fog from the west (Singer in Swanson Hydrology & Geomorphology, 2001).

The post-settlement period after 1800 witnessed profound human impacts from logging, mining, and development. As old-growth forests were clear-cut, roads and houses were constructed, and quarries were mined, both water quality and water supply were dramatically affected. The continued use of logging roads as residential access roads created chronic sources of erosion and sedimentation. The pervasive road network, especially unpaved and poorly maintained roads, continues today as the most persistent sources of sedimentation to streams. The District has not surveyed the roads on its watershed lands, but annually inspects and maintains its road system.

The San Lorenzo River has been considered impaired under the Clean Water Act by sediment since 1998, and has since been listed as impaired for nitrates and pathogens. Upland sediment sources and a general lack of large woody debris have continued the trend of bed sedimentation. The District's surface water supply tributaries are relatively protected, but sediment and turbidity remain the primary water treatment concerns.

Groundwater levels have declined in the two primary aquifers that comprise the Santa Margarita Basin, reducing the available water supply for the District and other water agencies. Groundwater recharge to the Santa Margarita Sandstone aquifer, tapped by the District's Olympia and Quail Hollow wells, is derived primarily from percolating rainfall. The recharge area for these wells is largely rural and undeveloped. Land use in the recharge area includes a closed sand quarry, undeveloped open space including timberland, and rural residential development. The District's Quail Hollow wells are susceptible to groundwater contamination from spills, due to high permeability of soils in the recharge area and residential development.

ES 1.4 Biotic resources

The Santa Cruz Mountains is defined as a bioregion. Best known for its redwood forests, it is also home to plant communities such as sandhills and sand parklands, found nowhere else in the world. This remarkable biological diversity also characterizes the San Lorenzo River watershed. Since most District-owned lands have not been biologically surveyed, assessment of its biotic resources relies on observations of staff, consultants, and findings of local studies. Human disturbance over the last 200 years has created significant, chronic impacts to plant communities, wildlife and fisheries habitats. These impacts have, in turn, affected the natural processes that are fundamental to ecosystem function, including the hydrologic or water cycle, the carbon cycle, nutrient cycle, energy cycle, and ecological community succession.

Redwood and mixed redwood forest plant communities cover approximately 75% of the San Lorenzo River watershed's land area, including most of the District's land around its surface water sources. The District's lands have not been surveyed for vegetation, wildlife, sudden oak death or invasive exotic species.

While almost all of the old-growth forest was clear-cut in the last century, the District's lands contain stands of second growth forests that are old enough to show some old-growth

characteristics, such as flat tops, snags and downed logs. Late seral-stage forests such as these provide valuable ecosystem services, including carbon sequestration, provision of clean water, and habitat for many species of mammals, birds, reptiles, amphibians, and fish.

At higher elevations, redwoods transition into mixed evergreen and chaparral plant communities, which commonly dominate the drier south-facing slopes. Other notable plant communities include riparian woodland, oak woodland, and grassland. The rare sandhills and sand parkland communities, which are found in and around the District's groundwater sources, include several endangered plant and animal species.

Sudden oak death has infected many areas of the watershed, and is present to some degree on District watershed lands. Invasive exotic plants, including French broom, eucalyptus and acacia, and exotic animal species such as feral pigs, are an acknowledged problem throughout the watershed, including the District's forest watershed lands and wellfields.

The San Lorenzo River and its estuary are inhabited by at least 25 different species of native fish. Both coho salmon and steelhead were once common and widespread throughout the coastal streams of the Pacific coast. Both species have declined; coho precipitously. In 1997, steelhead on the central coast were listed as threatened under the federal Endangered Species Act (ESA), and in 2005, coho salmon on the central coast were listed as endangered. Stream sedimentation, lack of large woody debris, water diversions, and barriers to stream passage have all contributed to these species' decline.

ES 1.5 Fire management

Fire is part of an important cycle of natural processes in forests and watersheds. Historic fire regimes of Native Americans included intentional burning. Fire suppression in more recent years has increased the chance of a major fire, which could seriously alter surface hydrology and sedimentation. No major wildfires have occurred in the watershed in the last three decades, which has increased the overall fuel load. Under the right conditions, a watershed-scale fire could result. Such a fire could impact watershed health and water quality from altered surface hydrology, increased sedimentation, chemical impacts from fire retardants, and habitat degradation. Critical fire weather is concentrated in July through October.

Drier inland areas are more prone to fire than moister coastal forests. Late seral stage redwood forests can resist the effects of all but the most intense wildfires. Redwoods are not fire dependent; that is, they can survive and regenerate without fire. Redwoods thrive in coastal areas with summer fog, which helps to lessen fire hazard.

Fire suppression is drastically altering the community structure of the rare sandhills plant communities. Invasive populations of French broom and acacia on the Olympia Wellfield have increased the risk of catastrophic fire.

The District's forested watershed lands have not been professionally assessed for fire hazard or for risk of ignition. CalFire, the state agency that manages wildfire, has rated most land in the District's service area on the west side of the San Lorenzo River as high fire hazard.

The District's watershed lands have not been specifically assessed in terms of the likely aftermath of a high intensity fire. Because elevated turbidities persist much longer in reservoirs than in streams, the District's surface water sources from local tributaries would probably have a

shorter recovery time than a reservoir source, such as Loch Lomond.

ES 1.6 Cultural, historical, recreational & educational resources

The first residents of the San Lorenzo River watershed were the Ohlone Indians, who were nomadic hunters and gatherers. They managed grasslands with fire to encourage the growth of seed-bearing annuals and to facilitate hunting. After colonial settlement, from the 1860s through the 1890s, logging was the major land use in the San Lorenzo River watershed. By 1899, Boulder Creek was the fifth largest shipper of timber in the country. Old-growth stumps are found throughout the watershed.

Mineral resources of the San Lorenzo River watershed are primarily lime, limestone, sand, gravel, and crushed rock. By 1878, Santa Cruz County supplied more than one-third of the state's lime production, mostly from quarries in the Felton and Santa Cruz areas. Within the watershed, old limekilns provide historical evidence of a once thriving industry.

Tourism began as an industry in the region early in the 1900s. Historically, the tourist industry focused on the redwoods of the San Lorenzo Valley, and the beach at Santa Cruz. The first state park was Big Basin, formed in 1906. Since the early 1960s State Parks have expanded to encompass over 9,000 acres of land in the watershed, including Henry Cowell, Fall Creek, Castle Rock, and Big Basin. There are also many county and city parks.

The District currently does not actively manage any of its lands for recreational purposes. It does have an agreement with the Santa Cruz County Horseman's Association (SCCHA) for limited use of the District's Olympia property. This agreement calls for an annual joint inspection of the entire trail network, but this has not occurred in recent years. There is evidence of unauthorized off-road vehicle use on the Olympia property, as well as evidence of damage to biotic resources caused by these unauthorized activities.

The San Lorenzo Valley has many educational resources, including schools, the university, the public libraries and the Boulder Creek Historical Society. The District has supported research efforts on its lands with respect to fisheries and wildlife habitat.

ES 1.7 Local climate change assessment

Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide, known as greenhouse gases (GHG), have increased markedly as a result of human activities since 1750. GHG levels now far exceed pre-industrial values determined from ice cores spanning many thousands of years. This increase is attributed to human activities, especially the burning of fossil fuels (coal, oil, natural gas) which have been locked within the earth's crust for millions of years, and the clearing and burning of forests.

Observed long-term changes in climate include altered Arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones. With virtual certainty, scientists have projected for this century--for most land areas in the world--that there will be warmer and fewer cold days and nights, and warmer and more frequent hot days and nights. They also project that there will very likely be more warm spells and heat waves, more heavy precipitation events, and global mean sea level rise of 1.4 meters or more by 2100.

For California, scientists have found that a doubling of CO₂ atmospheric conditions from pre-

industrial values will lead to increased temperatures of up to 4 degrees C on an annual average basis. Winters will be drier in all regions, with a slightly shorter wet season. The total amount of water in the state will decrease, water needs will increase, and the timing of water availability will be greatly perturbed.

These changes in temperature and precipitation will change vegetation patterns in watersheds and recharge areas. Increased rainfall and runoff intensity could result in more sewage overflows, and upset the basis of stormwater management plans and TMDLs.

The District has taken steps to address both the adaptation and mitigation sides of climate change. In 2008, the District Board approved a climate change resolution committing itself to meeting greenhouse gas emissions to AB 32 standards. In addition, the resolution has committed the District to addressing potential impacts of climate change in all of its planning documents.

Forests are natural sinks of carbon. There is carbon uptake into both vegetation and soils in terrestrial ecosystems. Forests absorb carbon dioxide from the atmosphere during photosynthesis, and store carbon in their biomass. Older forests store more carbon than younger forests. The declining average number of years between harvests means that less carbon is being stored in forests than in the past. While younger forests may, on average, grow at faster rates than older forests, older forests store more carbon per acre than younger ones.

The California Climate Action Registry (CCAR) is a non-profit public/private partnership that serves as a voluntary GHG registry to protect, encourage, and promote early actions to reduce GHG emissions.

California Assembly Bill 32 (AB 32), also known as the “California Global Warming Solutions Act of 2006,” is the first law to comprehensively limit greenhouse gas (GHG) emissions at the state level. AB 32 was passed by Legislature, signed by the governor, and became law January 1, 2007. It establishes annual mandatory reporting of GHG emissions for significant sources and sets emission limits to cut the state’s GHG emissions to 1990 levels by 2020.

The California Air Resources Board is required to incorporate the standards and protocols developed by the CCAR when developing the state’s mandatory reporting program. CCAR members who have entered their carbon emissions to CCAR standards will have their data recognized and accepted by the state’s future reporting program.

The San Lorenzo Valley Water District became a member of the CCAR in August 2007 and submitted its GHG emissions inventory report to CCAR in 2008.

CCAR is transitioning into the national GHG reporting nonprofit, The Climate Registry, which has adopted many of CCAR’s reporting protocols.

The CCAR has also created protocols for landowners of at least 100 acres of forestland in California to provide GHG emissions accounting, reporting, and certification guidance. Qualifying entities may be eligible to receive monetary carbon credits for preserving, reforesting or conserving their forests.