



## *APPENDIX E:* *REGIONAL GEOPHYSICAL DATA*

### *GEOPHYSICAL REGIONS*

We used the USGS Quaternary deposits data, together with current topographic data from the National Elevation Dataset  $\frac{1}{3}$ -arc second Digital Elevation Model, and rainfall isohyets from the Sonoma County Water Agency, to divide the Laguna into geophysical regions.

A study of surficial geology, precipitation, and topography revealed eighteen distinct geophysical regions. Defining these has proven to be especially useful in explaining why we see patterns of vegetation and the consequent patterns of human development throughout the watershed.

Plate 8 shows the eighteen geophysical regions of the Laguna. Their boundaries are well defined through the natural expression of rainfall patterns, surficial geology, elevation, soil, and vegetation.

The immediate imprint of the rainfall pattern on the land is to create a natural landscape of softwood and hardwood forests, grasslands and chaparral. Together with other natural ingredients, such as geological deposits, topographical features and soil characteristics, distinct vegetation zones become recognizable.

### *BENNETT VALLEY*

This region is situated in the eastern half of the watershed and is wholly encompassed by the Matanzas region. Matanzas Creek itself forms the region's western backbone. The region is called out for its distinct topography, which is gently tipped towards the west. The region enveloping Bennett Valley from the south, east and west, is characterized by steeper hills with drainage towards this bowl-shaped valley. From southeast to northwest, the region's major axis is about three miles long. The valley is

almost one and a half miles wide at its southern end and tapers down to about three-fourths of a mile in width at its northern end.

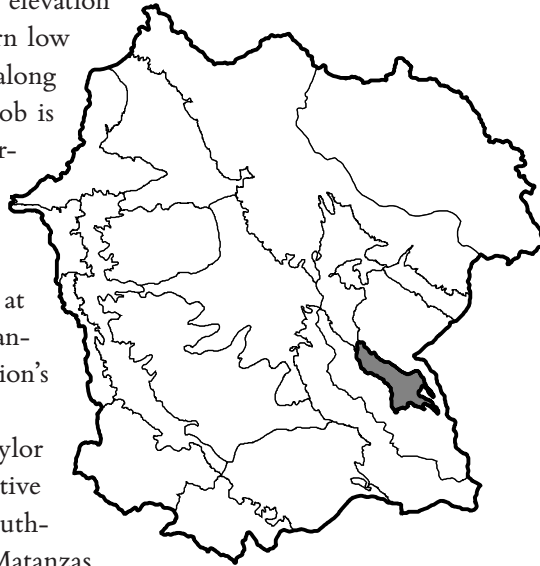
*Area:* 1719 acres (2.69 mi<sup>2</sup>).

*Topography:* The region smoothly loses elevation from its southern high point to its northern low point. Short hills rise at the southern end along both sides of Matanzas Creek. A small knob is situated just east of Matanzas Creek Reservoir. The region's average slope is 4.8%, with one-tenth of its surface area having a slope greater than 11.5%. The region's average elevation is 507' with its lowest point at 298' and its highest point at 720'. With a standard deviation of 82', about 95% of the region's surface area falls between 340' and 632'.

*Neighboring regions:* To the west, Taylor Mountain rises to 1401' casting a protective shadow across Bennett Valley. From the southwest, the ridgeline of the South Fork Matanzas Creek watershed crests at around 700' elevation; the creek itself enters Bennett Valley region at 521'. From the southeast, the main stem of Matanzas Creek forms along the western slope of the Sonoma Mountains; the creek itself enters the region at 567'. To the east, Bennett Mountain rapidly rises to 1527', completing the region's protective ring of hills. The valley's northern drain-point is also well protected, as the mountains to the east and west squeeze together forming a narrow exit to the valley.

*Climate:* Average annual rainfall within the region is approximately 34–41", with the drier parts towards the north, at the exit point for Matanzas Creek, and the wetter parts towards the south, in the Sonoma Mountain foothills. The presence of nearby Taylor Mountain provides an effective shield to the morning fog and the afternoon winds of the Santa Rosa Plain. Bennett Mountain's steep ascent to the east cuts off the morning sun during the summer providing a moderating effect to the region's temperature range.

*Impervious surface:* Approximately 143 acres or 8% of the region's surface area is covered with some type of impervious surface. None of this is considered to be more than 75% impervious (complete), 1 acre is considered to be between 50% and 75% impervious (heavy), 20 acres are considered to be between 25% and 50% impervious (partial), and 122 acres



are considered to be between 1% and 25% impervious (light). The remaining 1577 acres have not been built on or paved. The estimated canopy cover for the region is 18%.

*Ownership:* The Sonoma County Assessor lists 279 distinct parcels for the region, of these 95% are less than 21.2 acres in size. There are ten parcels greater than 40 acres in size comprising 41% of the region.

*Parks:* There are no public parks in this region. There are plans for public access in the future at a 25 acre property owned by the Open Space District which is adjacent to Annadel State Park.

*Habitat protection:* 209 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are the Open Space District greenbelt easement over Geary Ranch and the Sonoma County Water Agency property surrounding Matanzas reservoir. Protected properties with habitat value comprise 12% of the land in this region.

*Creeks and ponds:* The region is drained through 4.3 miles of named creeks and 13.8 miles of unnamed creeks and swales. Matanzas Creek runs through this region. There are eight ponds in the region totaling 24.5 acres in size. Notable among these is Matanzas Creek reservoir at 9.7 acres.

### BLUCHER

This region is comprised of a single major drainage basin, Blucher Creek, and two smaller drainage basins, Walker Creek to the north, and Turner Creek to the south. The region is situated in the southwest pocket of the Laguna de Santa Rosa watershed.

*Area:* 7756 acres (12.12 mi<sup>2</sup>).

*Topography:* The region is composed of lightly forested rolling hills with easterly trending watercourses. The region's average slope is 6.2%, with one-tenth of its surface area having a slope greater than 13.9%. The region's average elevation is 249' with its lowest point at 84' and its highest point at 731'. With a standard deviation of 111', about 95% of the region's surface area falls between 114' and 483'.

*Neighboring regions:* A high ridgeline along the region's southwest border separates the Blucher Creek watershed from the Upper Estero Americano watershed. The region's highest hills, along its western edge, separate Blucher Creek's water-



shed from the Atascadero watershed. This region is directly adjacent to the Laguna Region, which is situated to the east.

*Climate:* Average annual rainfall varies from 25 inches in the southeast to 33 inches in the northwest. Afternoon coastal breezes, which are characteristic of the Gossage Region, are still prevalent in the southeastern part of this region but diminish towards the northwest.

*Impervious surface:* Approximately 1088 acres or 14% of the region's surface area is covered with some type of impervious surface. Less than 0.5 acres of this are considered to be more than 75% impervious (complete), 14 acres are considered to be between 50% and 75% impervious (heavy), 139 acres are considered to be between 25% and 50% impervious (partial), and 934 acres are considered to be between 1% and 25% impervious (light). The remaining 6671 acres have not been built on or paved. The estimated canopy cover for the region is 20%.

*Ownership:* The Sonoma County Assessor lists 2144 distinct parcels for the region, of these 95% are less than ten acres in size. There are 24 parcels greater than 30 acres in size comprising 27% of the land in this region. The largest parcel in this region is 511 acres.

*Parks:* There are no public parks and no plans for public access in the future at properties in this region.

*Habitat protection:* 331 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. These include the Theiller Sebastopol Meadowfoam and Cunningham Marsh preserves and several easements over grazing lands. Protected properties with habitat value comprise 4% of the land in this region.

*Creeks and ponds:* The region is drained through 7.8 miles of named creeks and 19.1 miles of unnamed creeks and swales. The Blucher region includes the headwaters of Walker, Blucher, and Turner Creeks. There are 19 ponds in the region totaling eight acres in size. All ponds in this region are less than two acres in size.

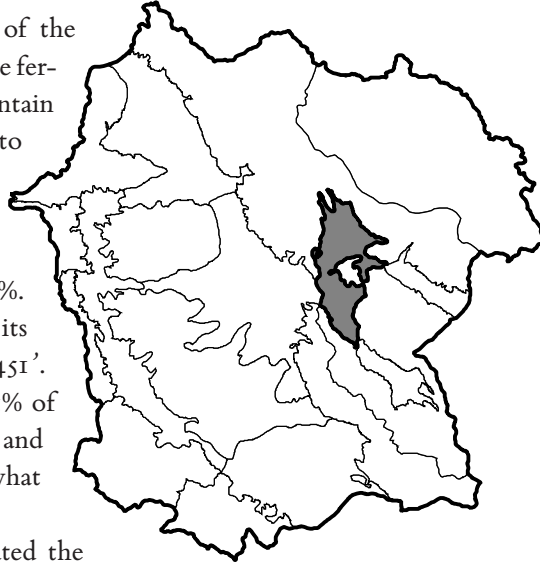
#### CABEZA

Situated at the convergence of three major drainage areas, this region's odd shape is a reflection of the underlying surface geology, the nearby topographic features, and the distinctive climatic regime of the area. Brush Creek and its tributaries form the northern half of the region, known colloquially as the Rincon Valley area. Matanzas and Spring Creeks form the southern half of the region, also known as the Yulupa section. The entire region sits on top of a complex of alluvial, terrace, and undifferentiated

sedimentary deposits. Protected from much of the Santa Rosa Plain's climatic influences, this region is similar to the moderate, Los Guilicos-style weather.

*Area:* 4418 acres (6.90 mi<sup>2</sup>).

*Topography:* The Cabeza is carved out of the surrounding mountains and includes only the fertile, flat bottomlands between Taylor Mountain to the west, the Sonoma Mountain foothills to the south, and the Mayacama Mountain front range to the north. The region's average slope is 2.0%, with one-tenth of its surface area having a slope greater than 5.4%. The region's average elevation is 269' with its lowest point at 192' and its highest point at 451'. With a standard deviation of 44', about 95% of the region's surface area falls between 212' and 356', with the higher elevations being somewhat anomalous.



*Neighboring regions:* To the east is situated the Los Guilicos Region, where Oakmont and Santa Rosa Creeks join at the small gap between the encroaching hills to the north and south. Enveloping the entire Rincon Valley area is the Foothills Region, which ascends steeply off the Cabeza's bottomlands. Similarly, the Yulupa area is surrounded by the rapidly ascending hills of the Matanzas Region. A small entrance to the adjoining Bennett Valley Region receives the combined waters of the Matanzas and South Fork Matanzas Creeks. All of the Cabeza's water drains out the western saddle where Matanzas, Spring, and Santa Rosa Creeks enter the Wright Region.

*Climate:* Annual rainfall in the region averages from 31–39". Higher rainfall occurs in both the northern and southern areas adjacent to the hills. To the north, the lower arm of the Foothills Regions wraps around the Cabeza's westward entrance creating a mild hillside effect: this area typically receives 33–39" of rain per year. To the south, Taylor Mountain juts up to create the lower jaw of the region's mouth: the area behind this elevated section receives approximately 35–39" of precipitation annually. The central portion of this region, following the line of the Santa Rosa Creek, receives the least amount of rainfall: 31–33" per year. Protected as it is from the fog and the wind, the Cabeza enjoys some of the watershed's most hospitable weather, a fact quickly perceived by Sonoma County's earliest settlers, the Carrillo family, in 1837.

*Impervious surface:* Approximately 3789 acres or 86% of the region's surface area is covered with some type of impervious surface. 104 acres of this are considered to be more than 75% impervious (complete), 950 acres are considered to be between 50% and 75% impervious (heavy), 1204 acres are considered to be between 25% and 50% impervious (partial), and 1532 acres are considered to be less than 25% impervious (light). The remaining 631 acres have not been built on or paved. The estimated canopy cover for the region is 22%.

*Ownership:* The Sonoma County Assessor lists 10,319 distinct parcels for the region, of these over 95% are less than 1 acre in size. There are 26 parcels greater than ten acres in size comprising 18% of the land in this region.

*Parks:* The principal parks of the region which are open to the public include Spring Lake Regional Park and trails along Brush Creek. Most existing parks are semi-urban parks. There are no plans for future public access at properties in this region.

*Habitat protection:* 296 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are Spring Lake Regional Park, the City of Santa Rosa's Flat Rock Park, and several Sonoma County Water Agency properties. Protected properties with habitat value comprise 7% of the land in this region.

*Creeks and ponds:* The region is drained through 22.7 miles of named creeks and six miles of unnamed creeks and swales. This region includes segments of Santa Rosa, Matanzas, Spring, Brush, Skyhawk, and Ducker Creeks. There are two lakes in the region totaling 67.2 acres in size. These include Spring Lake and the smaller pond adjacent to it.

#### COTATE

This region is well-defined by its underlying sediment deposits. Drainage is from east to west across a textbook version of an alluvial fan formed as water leaving the Sonoma Mountains reaches the level expanse of the Santa Rosa Plain. The ever-shifting watercourses of the 19<sup>th</sup> century, caused by periodic creek avulsions, define a matrix of generally westward flowing creeks. In the post-development era, engineers have fixed the course of these waterways into the channels now referred to as Copeland, Hinebaugh, Crane, and Coleman Creeks. The present day course of the Laguna de Santa Rosa is also a modern-era creation. Once drained, these alluvial soils became highly productive farmland.

*Area:* 9701 acres (15.16 mi<sup>2</sup>).

*Topography:* One of the watershed's flattest regions, the Cotate's imperceptible slope, when seen on a topographic map, has the appearance of a convex lens with its gradual drop in elevation occurring radially about the centerline of Copeland Creek. The region's average slope is 0.8%, with one-tenth of its surface area having a slope greater than 3.0%. The region's average elevation is 131' with its lowest point at 82' and its highest point at 475'. With a standard deviation of 49', about 95% of the region's surface area falls between 90' and 253', with the higher elevations being very anomalous.



*Neighboring regions:* The Cotate Region receives all of its surface water from the neighboring Taylor Region, situated to the east. The region is bounded on the north by the clay-capped volcanic bedrock of the Llano. To the southeast, the region is bordered by the Petaluma River watershed, which in the recent geologic past received the waters of Copeland Creek from time to time. The region is bounded on the southwest by the low hills of Gossage.

*Climate:* Annual rainfall in the region averages from 27–38". A slight gradient of measured precipitation is noticeable moving from the region's western average, near the Gossage/Laguna frontier, of 27" per year to its eastern average, skirting the edge of the Sonoma Mountains, of 38" per year.

*Impervious surface:* Approximately 5838 acres or 60% of the region's surface area is covered with some type of impervious surface. 367 acres of this are considered to be more than 75% impervious (complete), 2163 acres are considered to be between 50% and 75% impervious (heavy), 1381 acres are considered to be between 25% and 50% impervious (partial), and 1928 acres are considered to be less than 25% impervious (light). The remaining 3867 acres have not been built on or paved. The estimated canopy cover for the region is 5%.

*Ownership:* The Sonoma County Assessor lists 13,876 distinct parcels for the region, of these 95% are smaller than 1.4 acres in size. There are 48 parcels greater than 30 acres in size comprising 32% of the land in this region. There are five parcels between 118 and 208 acres in size.

*Parks:* The principal parks of the region which are open to the public include trails along Sonoma County Water Agency channels and urban

parks in Cotati and Rohnert Park. Most existing parks are urban parks. There are no plans for future public access at properties in this region.

*Habitat protection:* 145 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are several miles of Sonoma County Water Agency channels. Protected properties with habitat value comprise 1% of the land in this region.

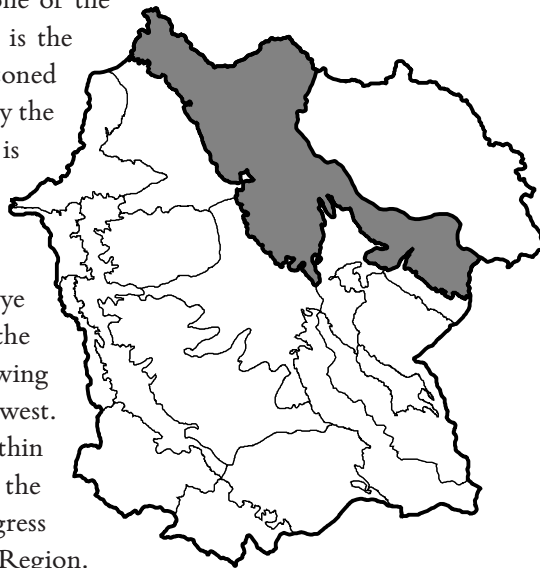
*Creeks and ponds:* The region is drained through 23.9 miles of named creeks and 12.3 miles of unnamed creeks and swales. The headwaters of the Laguna de Santa Rosa are located in this region. There are 29 ponds in the region totaling 39.4 acres in size. Notable among these is the 13.4 acre wetland that is part of the Laguna de Santa Rosa near Stony Point Road and Rohnert Park Expressway. The remaining ponds are five acres or less in size.

#### FOOTHILLS

This is the Mayacamas area situated north of the city of Santa Rosa and west of the town of Windsor, drained by upper Santa Rosa Creek, the middle reaches of Mark West and several of its major tributaries. From southeast to northwest the region spans a 16 mile length and a two- to five-mile width. The foothills sharply rise out of the adjacent Santa Rosa Plain to the west and the adjacent Los Guilicos Valley to the south, but without reaching the hill elevations characteristic of the Montane Region to the east. The creeks and their tributaries in this region follow tight valley and ridge formations, making this one of the more rugged parts of the watershed. This is the largest portion of the watershed which is zoned by the county for use as rural residences; only the northernmost part of the Foothills Region is used for agriculture.

*Area:* 27,630 acres (43.17 mi<sup>2</sup>).

*Topography:* The region is a continuous expanse of valleys and ridges. A birds-eye view of the region, from the southeast to the northwest, reveals a dozen named creeks flowing out of the Montane towards the south and west. Only a couple of tiny level hideouts exist within the region, one along Windsor Creek and the other along Mark West Creek where they egress from the foothills and join the San Miguel Region.





The region's average slope is 14.6%, with one-tenth of its surface area having a slope greater than 28.6%. The region's average elevation is 659' with its lowest point at 143' and its highest point at 1935'. With a standard deviation of 328', about 95% of the region's surface area falls between 261' and 1368', an even distribution of mountains and valleys.

*Neighboring regions:* The Montane Region shares a long border with the Foothills Region; these two are fraternal twins, differing mostly in the height of their ridgelines and the consequent amount of elevation-induced precipitation. To the south lay the Los Guilicos and Cabeza regions with their very flat topography and their mixed basin and terrace deposits. To the west lay the Wright and San Miguel regions which form the northern extension of the Santa Rosa Plain and which are underlain by alluvial fan deposits. To the north are the Brooks Creek watershed and the Adam and Eve watershed, both of which flow directly to the Russian River.

*Climate:* Average annual rainfall for the region ranges from 32–55". The driest areas of the region are found along the southern end of the front range, drained by Paulin Creek, which receives 32–37" of precipitation annually. The inner protected area drained by Ducker, Austin, Santa Rosa and Oakmont Creeks, receives as little as 34" in the lower elevations and as much as 55" in the upper elevations; the rainfall pattern closely matching the area's elevation. The northern end of the region, drained by Windsor, Wright, Pool, Shiloh and Mark West Creeks, receives from 38–49" annually, again with precipitation correlating tightly to elevation. Diurnal winds patterns in the summer, are characterized by late afternoon up-valley flow of warm air built up over the Santa Rosa Plain; during the winter the region experiences mild pre-dawn katabatic winds.

*Impervious surface:* Approximately 4709 acres or 17% of the region's surface area is covered with some type of impervious surface. 41 acres of this are considered to be more than 75% impervious (complete), 380 acres are considered to be between 50% and 75% impervious (heavy), 893 acres are considered to be between 25% and 50% impervious (partial), and 3395 acres are considered to be between 1% and 25% impervious (light). The remaining 22,934 acres have not been built on or paved. The estimated canopy cover for the region is 54%.

*Ownership:* The Sonoma County Assessor lists 7478 distinct parcels for the region, of these 95% are smaller than twelve acres in size. There are 103 parcels greater than 50 acres in size comprising 46% of the land in this region. Fourteen parcels are between 211 and 695 acres in size.

*Parks:* The principal parks of the region which are open to the public include Foothill and Shiloh Regional Parks, a portion of Hood Mountain

Regional Park, and a number of urban parks in northeastern Santa Rosa. Most existing parks are urban parks, but the majority of parkland acreage is wildlands. There are presently no plans for additional public access to properties in this region.

*Habitat protection:* 3850 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are Foothill and Shiloh Regional Parks, and portions of the Pepperwood Preserve and Windsor Oaks. Protected properties with habitat value comprise 14% of the land in this region.

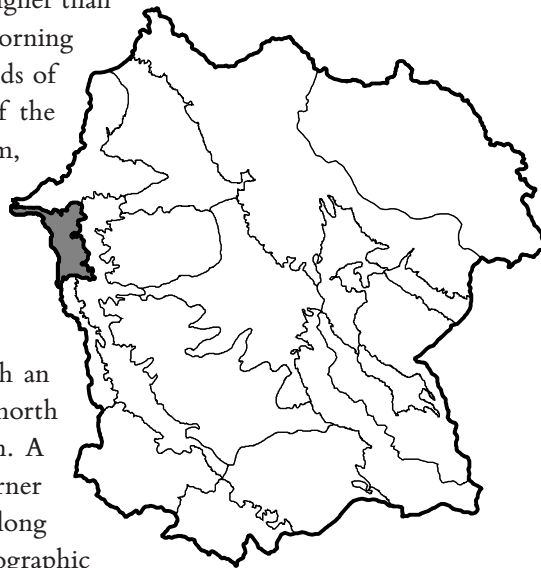
*Creeks and ponds:* The region is drained through 30.1 miles of named creeks and 50.7 miles of unnamed creeks and swales. This region includes portions of Mark West Creek as well as the headwaters of Wright, Pool, Shiloh, Rincon, Ducker, Austin, and Santa Rosa Creeks. There are 52 ponds in the region totaling 142 acres in size. Notable among these are a handful of agricultural ponds between four and 9.7 acres, Shiloh Ridge Lake (private, 23.9 acres) and Fountaingrove Lake at Fountaingrove Community Park (29 acres).

#### FORESTVILLE

This region is located in the far northwest corner of the Laguna de Santa Rosa's watershed; it is situated south and west of the combined Mark West/Laguna watercourse. It has a mixed character of both steep bluffs and broad valleys, but has generally low elevations when compared to the other hilly regions of the watershed. Higher than average annual precipitation and late morning fog give this region the ability to host stands of redwoods. The average east-west extent of the region is about one mile, except for a left arm, about a mile in length, extending west and running parallel to the Laguna. The region's north-south distance is about two and a half miles in straight-line distance.

*Area:* 2193 acres (3.43 mi<sup>2</sup>).

*Topography:* Gently sloping terrain with an east-facing aspect in the bottom half and a north facing aspect in the top half of the region. A small knob in the region's northeast corner together with a slightly elevated ridgeline along the region's northwest edge offers some topographic





variety. One well-carved tributary drains the bottom third of the region; two small tributaries drain the middle one third of the region; a small collection of short northerly trending tributaries run off the high ridge-line in the upper third of the region. The region's average slope is 9.3%, with one-tenth of its surface area having a slope greater than 20.5%. The region's average elevation is 188' with its lowest point at 57' and its highest point at 517'. With a standard deviation of 78', about 95% of the region's surface area falls between 91' and 346', with the higher elevations being somewhat anomalous.

*Neighboring regions:* To the west, the lower Green Valley watershed flows into the Russian River. Skirting the length of the north and east edges is the Laguna's floodplain. To the south, the Goldridge region reaches its northern defined boundary.

*Climate:* Average annual rainfall is approximately 35 inches throughout most of the region with a slightly higher reading of 39 inches along the long skinny arm that approaches the Russian River. Late morning fog lingers in the lower Vine Hill Creek and Clark Creek valleys due to the nearby influence of the Laguna de Santa Rosa.

*Impervious surface:* Approximately 253 acres or 12% of the region's surface area is covered with some type of impervious surface. Less than 0.5 acres of this are considered to be more than 75% impervious (complete), 1 acre is considered to be between 50% and 75% impervious (heavy), 22 acres are considered to be between 25% and 50% impervious (partial), and 230 acres are considered to be between 1% and 25% impervious (light). The remaining 1941 acres have not been built on or paved. The estimated canopy cover for the region is 54%.

*Ownership:* The Sonoma County Assessor lists 470 distinct parcels for the region, of these 95% are smaller than 21 acres in size. There are 14 parcels greater than 30 acres in size comprising 33% of the land in this region.

*Parks:* There are presently no public parks in this region.

*Habitat protection:* 1.8 acres of land have noteworthy habitat value and have been placed under easements providing some level of habitat protection. This small parcel is a sliver of the Indian Valley property which is held under conservation easement by the Open Space District; it is primarily located in the Laguna region. Protected properties with habitat value comprise less than 1% of the land in this region.

*Creeks and ponds:* The region is drained through ten miles of unnamed creeks and swales. Vine Hill Creek and Castens Creek both have their

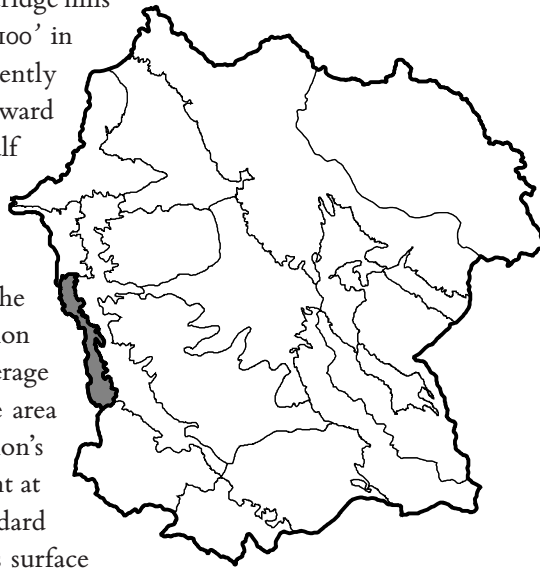
headwaters in this region. There are four ponds in the region totaling 2.8 acres in size.

#### GOLDRIDGE

This region is the narrow ribbon of land situated west of the Laguna's channel and out of its floodplain. The region is characterized by a plateau-like tabletop breaking away along a short but moderately steep bluff fronting the Laguna. The average east-west extent of the region is about one-half mile. The region's north-south extent is about five miles in a straight-line distance. The overall drainage of the area is through short creeks and ephemeral water courses trending towards the east and joining the Laguna de Santa Rosa after crossing a wide floodplain. Vegetation patterns change from classic riparian habitat along the region's eastern edge to a mixed upland habitat of redwoods and black oaks. Several significant springs keep their waters flowing throughout the summer providing secret pockets of unique plant-life.

*Area:* 1946 acres (3.04 mi<sup>2</sup>).

*Topography:* The front-range of the Goldridge hills rises above the Laguna's floodplain 50' to 100' in a rapid ascent. To the west, the hills crest gently before imperceptibly losing elevation toward the Atascadero watershed. The southern half of the region is composed of very gently rolling hills with wide valleys; the northern half is composed of a series of steeper and narrower valleys, each carved out of the crumbly soils of the Wilson Grove formation so well noted in this region. The region's average slope is 5.8%, with one-tenth of its surface area having a slope greater than 11.9%. The region's average elevation is 182' with its lowest point at 62' and its highest point at 355'. With a standard deviation of 49', about 95% of the region's surface area falls between 110' and 271', an even distribution of valleys and hills.



*Neighboring regions:* The region's western boundary defines the Laguna's overall watershed boundary. The gently rolling hills of Goldridge spill away imperceptibly towards the Atascadero watershed on this western frontier; a traveler can enter and leave the region on many of the city of Sebastopol's roads without knowing it. In contrast, the eastern edge

of the region is well defined by a steep drop in elevation, a feature most easily seen when driving along High School Road. The Blucher region, to the south, which has many of the same geological characteristics and soil composition, differs mostly in temperature and rainfall. The Forestville region, to the north, is also similar to the Goldridge region in soil composition, but differs mostly in its topography which shows greater variability.

*Climate:* An annual rainfall of about 35–38 inches uniformly falls on the region. The afternoon wind and coastal fogbank, so characteristic of the regions to the south, is less frequently encountered here. Infrequently fog will reach the region from the Atascadero valley to the west and from the floodplain of the Laguna to the east. This sunnier and warmer climate was noted by early settlers to the area. Pine Grove, the area's first post office in 1855, eventually became known as Sebastopol. Today, the citizens of Sebastopol enjoy this region's mild climate and gentle rolling hills.

*Impervious surface:* Approximately 866 acres or 45% of the region's surface area is covered with some type of impervious surface. Nine acres of this are considered to be more than 75% impervious (complete), 58 acres are considered to be between 50% and 75% impervious (heavy), 189 acres are considered to be between 25% and 50% impervious (partial), and 610 acres are considered to be between 1% and 25% impervious (light). The remaining 1081 acres have not been built on or paved. The estimated canopy cover for the region is 42%.

*Ownership:* The Sonoma County Assessor lists 1946 distinct parcels for the region, of these 95% are smaller than three acres in size. There are 15 parcels greater than 15 acres in size comprising 31% of the land in this region.

*Parks:* The only park in this region which is open to the public is the City of Sebastopol's Libby Park. There are presently no plans for additional public access to properties in this region.

*Habitat protection:* 4.7 acres of land have noteworthy habitat value and are publicly owned providing some level of habitat protection. These include two Department of Fish and Game Wildlife Areas. Protected properties with habitat value comprise less than 1% of the land in this region.

*Creeks and ponds:* The region is drained through 1.7 miles of named creeks and 6.1 miles of unnamed creeks and swales. There is one pond in the region totaling 3.4 acres in size: it is located at the northern end of the region, and sits at the headwaters of Frei Creek.

*Calder Creek:* The region's southernmost creek is situated wholly within the City of Sebastopol. Its headwaters form in a rare pocket of medium-sized (3- to 12-acre) parcels, all heavily wooded, located along Robinson Road at ~35.97. The creek follows a northward course parallel to Robinson Road flowing through city neighborhoods with a thin ribbon of vegetative cover. After flowing through Jewel Park, the creek is carried underground until it daylights just east of Petaluma Avenue. Calder Creek flows through the Railroad Forest, a heavily wooded lowland, just north of the Joe Rodota Trail, and joins the Laguna de Santa Rosa at ~35.69.

*Zimpher Creek:* Only scattered remnants of Zimpher creek remain above ground. Beginning just east of Zimpher Drive at ~36.55 the creek's drainage area follows an easterly course running parallel to Brookside Avenue through a thinly wooded area in urban backyards. At West Street the creek's water is carried underground until it daylights east of Morris Street. The final 600' of the creek flows through a thickly covered riparian area before emerging into the Laguna de Santa Rosa at ~35.47.

*Pine Tree Creek:* A short creek, less than one mile in length, beginning at ~35.13 near Harris Hills Drive, flows south and then east before crossing High School Road just north of E. Hurlbut Road. This creek is notable for its underlain alluvium which hints at its greater importance in recent geologic history.

*Jerusalem Creek:* A short seasonal waterway flows through a wooded area approximately 300' wide beginning at ~34.13 near Hurlbut Lane. Moving in a northeasterly direction the waterway flows through a winter-time holding area for dairy cows which is heavily stressed. The waterway has some apparent down-cutting in this area. After crossing under High School Road the water joins the Laguna de Santa Rosa's floodplain in an undefined channel around ~33.62.

*Unnamed waterway near Hurlbut Avenue:* At ~33.89 near Joyce Lane and Hurlbut Avenue an unnamed waterway flows north beginning in apple orchards and soon passes through a 200-300' wide wooded area. Just before Occidental Road the waterway turns eastward flowing in a roadside ditch halfway to High School Road before crossing under Occidental Road and diverting across the floodplain to the north meeting the Laguna de Santa Rosa at ~32.84.

*Unnamed waterway along Occidental Road:* At ~33.48 an unnamed waterway forms in the roadside ditches both north and south of Occidental Road. Flowing east, the waterway passes only scattered trees before joining the Laguna de Santa Rosa floodplain and crossing through an undefined channel to ~32.84.

*Barcaglia Creek:* At  $\sim 33.59$  a waterway forms between the canyon-like hillsides along Barcaglia Road. A USGS topographic quadrangle shows a tiny water body, possibly a spring (unverified), at the top of the hill to the south of Barcaglia. The waterway's course is wooded with approximately 200 feet of riparian cover. The waterway flows through the Laguna de Santa Rosa's floodplain in an undefined channel joining it at approximately  $\sim 32.84$ .

*Unnamed waterway:* At  $\sim 32.90$  a waterway forms in a vineyard, flows northeast along the base of a hill through a small clump of trees and joins the Laguna de Santa Rosa floodplain; it crosses in an undefined channel joining the Laguna's main stem at approximately  $\sim 32.41$ .

*Scotts Creek:* Beginning in two year-around springs, this creek starts at  $\sim 32.85$  and  $\sim 32.74$  in a heavily wooded area. The two spring-fed sources join at  $\sim 32.64$  before heading northeast through medium and then light riparian cover. The creek is joined at  $\sim 32.37$  by another spring-fed watercourse that flows from a small pond situated on a golf course. This creek joins the Laguna's main stem at approximately  $\sim 32.26$ .

*Unnamed swales:* At  $\sim 32.43$  and  $\sim 32.38$  two swales form in a vineyard and flow without any apparent tree-cover towards the Laguna de Santa Rosa, joining it at  $\sim 31.95$  after flowing across the floodplain.

*Smith Creek:* At  $\sim 32.91$  a creek forms in a vineyard, then flows through a wide but lightly wooded area for about a quarter of a mile. The creek is crossed by and then runs parallel to Frei Road. At  $\sim 32.11$  the creek is joined by Guy Creek. This area is lightly wooded; the creek joins the Laguna's main stem after crossing its floodplain in an undefined channel joining it at  $\sim 31.84$ .

*Guy Creek:* At  $\sim 32.91$  Guy Creek forms in a vineyard. This stretch of Guy Creek, west of Frei Road, flows through a thin ribbon of newly created riparian vegetation.

*Unnamed waterway:* At  $\sim 33.32$  an unnamed waterway forms in a vineyard where it is protected by about 100' of riparian cover for its first one quarter mile. The waterway continues through the vineyard, but the riparian shrinks to about 30'. It joins Frei Creek at  $\sim 32.24$ .

*Frei Creek:* An agricultural pond at  $\sim 32.89$  is the beginning of Frei Creek. The first 1000' of the creek is covered in riparian growth that is about 100' wide. It then continues to flow east through a vineyard and joins with an unnamed waterway at  $\sim 32.24$ . Flowing south from there, the next 1000' is protected with the beginnings of new riparian tree plantings. Frei Creek joins the Laguna at  $\sim 31.79$ .



*Wetlands:* A constructed wetlands has been built just west of Delta Pond between Laguna de Santa Rosa points ~31.17 and ~31.50. The construction of the wetlands was completed in 2003.

*Gazetteer:* Smith Creek named for George Smith, former owner of Georgetown. Guy Creek named for Guy Smith, present owner of Georgetown. Frei Creek named after Frei Road. Jerusalem Creek named after Jerusalem Road. Barcaglia Creek named for Barcaglia Road and former owners. Scotts Creek named for present owners. Pine Tree Creek named after Pine Tree Road.

#### GOSSAGE

This region is comprised of three drainage basins, Gossage Creek, Washoe Creek and Cotati Creek, situated at the southernmost portion of the Laguna de Santa Rosa watershed. The region is characterized by open rolling hills principally used for livestock grazing and hay production.

*Area:* 4787 acres (7.48 mi<sup>2</sup>).

*Topography:* Open rolling hills with northerly trending watercourses flowing through wide shallow valleys. Most of the region is tipped gently towards the north, with low hills situated between the Gossage and Washoe drainage areas. The region's average slope is 6.4%, with one-tenth of its surface area having a slope greater than 13.3%. The region's average elevation is 263' with its lowest point at 106' and its highest point at 688'. With a standard deviation of 101', about 95% of the region's surface area falls between 133' and 479', with the higher elevations being very anomalous.

*Neighboring regions:* The region's southern border is defined by a gentle ridgeline which also defines the Laguna de Santa Rosa's southern watershed boundary. To the northeast, the rolling hills slowly give way to the Cotate Region and the Santa Rosa Plain, without a significant break-line: hydrologically there is little change in the waterways' velocity and consequently there are few alluvial deposits at the region's frontier. The Blucher Valley region, which receives more rain and less wind, is situated to the northwest.

*Climate:* Annual rainfall averages between 30 and 33 inches in this region with slightly drier areas found towards the south, outside the





watershed. This is the driest region in the Laguna's watershed. Coastal breezes arrive each afternoon, via the Petaluma Gap, providing a cooling effect to the region.

*Geology:* Gossage Creek and Washoe Creek are both underlain by narrow ribbons of undifferentiated alluvium. To the northeast, and for the most part occurring outside the boundaries of this region, is a large band of late Pleistocene undifferentiated alluvium. The majority of the region is bedrock.

The Tolay Fault, a 10,400-meter Quaternary-period fault, slices through the region from NW to SE, bisecting Gossage Creek near the intersection of Schmidt and Peterson Roads and clipping the headwaters of Washoe near Roblar and Stony Point Roads. This is the northernmost end of the fault. An unnamed 6520-meter Quaternary-period fault runs along the southern ridgeline of the region beginning at Meacham Road and extending NW to Roblar Road, just west of Canfield Road.

*Impervious surface:* Approximately 649 acres or 14% of the region's surface area is covered with some type of impervious surface. 17 acres of this are considered to be more than 75% impervious (complete), 69 acres are considered to be between 50% and 75% impervious (heavy), 176 acres are considered to be between 25% and 50% impervious (partial), and 387 acres are considered to be between 1% and 25% impervious (light). The remaining 4140 acres have not been built on or paved. The estimated canopy cover for the region is 6%.

*Ownership:* The Sonoma County Assessor lists 942 distinct parcels for the region, of these 95% are smaller than 13 acres in size. There are 24 parcels greater than 100 acres in size comprising 45% of the land in this region.

*Parks:* The principal parks of the region which are open to the public include Thomas Page Park and Veterans Park in the City of Cotati. There are presently no plans for additional public access to properties in this region.

*Habitat protection:* 502 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are Stony Point Ranch and the Knudtsen Dairy. Protected properties with habitat value comprise 11% of the land in this region.

*Creeks and ponds:* The region is drained through 5.0 miles of named creeks and 12.3 miles of unnamed creeks and swales. Gossage Creek, Washoe Creek, and Cotati Creek all have their headwaters in this region. There are 18 ponds in the region totaling 21.1 acres in size. Notable among

these is a 9.2 acre agricultural pond owned by Gallo Vineyards. The remaining ponds are each less than 2.5 acres.

*Gossage Creek:* Gossage Creek begins at ~49.09 and joins the Laguna de Santa Rosa at ~42.79, the final two miles of Gossage falling outside this region's boundary. An unnamed tributary, 1.37 miles in length, extends westward from ~46.34. An unnamed tributary, 1.13 miles in length, extends south from ~47.23. The region's highest elevations are found along the southern boundary's ridgeline. The Gossage Creek area is dominated by open fields, pasture and dairies. A short stretch along Blank Road and Orchard Station are rural residences.

Nearly all of the area's waterways are completely free of woody vegetation. Many of the area's swales and creeks show signs of stress from close grazing.

*Washoe Creek:* Washoe Creek begins at ~46.81 and joins the engineered channel of Gossage at ~44.14. Historic Washoe Creek, which still flows, no longer carries water from its upper watershed; this lower portion of Washoe begins at ~44.58 and joins the Laguna de Santa Rosa at ~43.59. Historically Washoe's course was 3.22 miles in length but has now been foreshortened to 2.67 miles in length. The Washoe Creek area is almost exclusively range land, the Isabel Drive subdivision being the only exception. The Stony Point Rock Quarry, located west of Stony Point Road near its intersection with Sierra occupies approximately 126 acres. The county's landfill is located just outside the region's southern boundary on Meacham Road.

Most of the area's upper waterways are completely free of woody vegetation and show signs of stress from close grazing. The 0.22 mile stretch of Washoe Creek north of Roblar Road, from ~45.88 to ~45.66, has some recently emerging willows. The 0.33 mile stretch between Sierra Avenue and Madrone Avenue has slightly more woody vegetation, but it is still confined to the narrowest of ribbons.

*Cotati Creek:* Cotati Creek begins at ~46.96 and joins the Laguna de Santa Rosa 1.67 miles downstream at ~45.29. Most of the creek's course flows within the urban boundary of the City of Cotati and all but the first 0.16 miles lie east of Highway 101. Cotati Creek's headwaters are open grassland with no woody vegetation. The middle stretch running parallel to Water Road has increasing riparian vegetation as the stream moves north. The stretch running parallel to Sierra Avenue, while hemmed in by urban residences, has a narrower but still adequate canopy. Beginning at Page Street and ending at its confluence with the Laguna de Santa Rosa, the creek bank is armored with vertical concrete walls. An unnamed

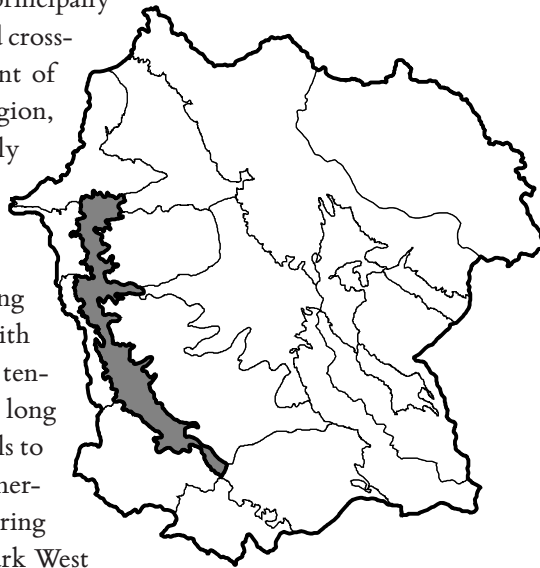
tributary joins Cotati Creek from the west side of Highway 101 at ~46.01. A very large vineyard, accompanied by the county's largest agricultural pond (9.15 acres), dominates the landscape west of Highway 101 and south of Sierra Avenue. The School Street area, bounded to the north by Cotati Avenue and to the south by Sierra Avenue is characterized by low rolling hills. This area is divided into 2- to 4-acre rural residential parcels.

### LAGUNA

As a distinct area of the watershed, the Laguna Region comprises the area that foremost leaps to mind as being the "essence" of the Laguna de Santa Rosa. This is the region that is host to the braided channels, oxbows, wetlands and perennial water bodies that lie, topographically, in the watershed's sink. Along the north-south axis, this region spans a length of nearly twelve miles. Along its east-west axis, this region is seldom more than a mile, or less than three-quarters of a mile, in width. Underlain by alluvium, both recent and ancient, the Laguna Region is host to a checkerboard of agriculture and publicly-owned wildlands.

*Area:* 7420 acres (11.59 mi<sup>2</sup>).

*Topography:* Water reaches this region principally from the east after leaving the mountains and crossing the Santa Rosa Plain. A smaller amount of water arrives from the western side of the region, directly off the Goldridge Hills. Formerly acting as a natural sump, the region was recognized as a series of bottomland pools punctuated by a few naturally occurring high spots which early pioneers used as fording points. Without a well-defined tilt, and with the presence of these high spots, the natural tendency for the region was to hold water for long periods of time; evaporation caused the pools to shrink during the precipitation-free summer-time months. Drainage for the region during freshets was towards the north, through Mark West Creek to the Russian River. Today's year-round egress for the accumulated waters of this region is through drainage channels that have been dug between 1867 and 1960. Prior to these alterations, the region's topography would normally facilitate annual cycles of inundation and evaporation.





The region's average slope is 1.5%, with one-tenth of its surface area having a slope greater than 4.9%. The region's average elevation is 75' with its lowest point at 46' and its highest point at 191'. With a standard deviation of 18', about 95% of the region's surface area falls between 52' and 113', with the higher elevations being very scarce.

*Neighboring regions:* To the west of the Laguna Region lie three hill regions Blucher, Goldridge, and Forestville, which differ from each other mostly in terms of precipitation. To the east of the Laguna Region lie the two vernal pool dominated regions Llano and Piner. Only very short edges of Cotate, Wright, and San Miguel regions share common boundaries with the Laguna. To the north, the diversified River Region is the recipient of the Laguna de Santa Rosa's waters.

*Climate:* Annual rainfall in the region averages from 30–36". A slight gradient of precipitation is measurable moving from the region's southern part, between Llano and Blucher, and the region's northern part, between Goldridge, Forestville and Piner. The adjacent hills to the west receive more rainfall than the nearby eastern plains.

*Impervious surface:* Approximately 1382 acres or 19% of the region's surface area is covered with some type of impervious surface. 71 acres of this are considered to be more than 75% impervious (complete), 182 acres are considered to be between 50% and 75% impervious (heavy), 329 acres are considered to be between 25% and 50% impervious (partial), and 800 acres are considered to be between 1% and 25% impervious (light). The remaining 6041 acres have not been built on or paved. The estimated canopy cover for the region is 22%.

*Ownership:* The Sonoma County Assessor lists 1826 distinct parcels for the region, of these 95% are eleven acres or smaller in size. There are 45 parcels greater than 30 acres in size comprising 54% of the land in this region. Fourteen parcels are larger than 100 acres in size.

*Parks:* The principal parks of the region which are open to the public include the City of Sebastopol's Laguna Preserve and Railroad Forest, the Joe Rodota Trail, the Laguna Uplands, and several urban parks located in Sebastopol. Most existing parks are wildland parks. There are plans for public access at properties owned by the City of Santa Rosa including Stone, Kelly, Brown, and Alpha Farms, which are held under Open Space District conservation easements.

*Habitat protection:* 1528 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are the City of Sebastopol's Laguna Preserve, several Department of Fish and Game

Wildlife Areas, the Board of Utilities Delta Pond property, several miles of Sonoma County Water Agency channels, and portions of properties held by the City of Santa Rosa including Stone, Kelly, Brown, and Alpha farms. Protected properties with habitat value comprise 21% of the land in this region.

*Creeks and ponds:* The region is drained through 36.9 miles of named creeks and 30.1 miles of unnamed creeks and swales. This region includes the majority of the Laguna de Santa Rosa channel as well as the confluences of nearly all tributaries of the Laguna. There are 73 ponds in the region totaling 343.4 acres in size. Notable among these are the Llano wastewater treatment plant ponds (85.2 acres), Delta Pond (90.0 acres), the Gallo mitigation wetlands (17.3 acres), and the string of ponded areas along the Laguna de Santa Rosa's channel.

### LLANO

This is the region most often called to mind when thinking about vernal pools in Sonoma County. It is the quintessential Santa Rosa Plain. Flat, featureless and composed of poorly drained soils, its charms are easily obscured by the human drama of floods and mud. But these very characteristics, melded with the region's Mediterranean climate, are what give rise to the winter ponding that bursts each spring into fresh life. This region is just far enough away from the mountains that it doesn't receive the benefit of fresh new alluvium, and just far enough away from the Laguna to not receive the benefit of its Russian River drainage. Even today, rainfall in this region is just as likely to remain where it falls as it is to drain towards one of the rare waterways traversing from east to west. The north-south extent of the region is about seven miles while the east-west extent varies from three to four miles.

*Area:* 14,611 acres (22.83 mi<sup>2</sup>).

*Topography:* The nicely defined ridges and valleys of the regions to the east and west are nowhere to be seen in the Llano. The natural drainage of the region is poor due to a combination of the water restricting soils of the Glen Ellen Formation and very little topographic relief. The only natural drainage across this region is through the widely separated creeks Colgan, Roseland, Gravenstein and Irwin, leaving even the



casual visitor to remark upon its paucity of streams. Human industry has assisted what nature has neglected and we now have the Bellevue-Wilfred Flood Control channel, Hunter and Moorland “Creeks”, a levee-armored Colgan Creek, and a partially rerouted Roseland Creek.

The region’s average slope is 0.4%, with one-tenth of its surface area having a slope greater than 1.6%. No other region is flatter. The region’s average elevation is 94’ with its lowest point at 52’ and its highest point at 219’. With a standard deviation of 14’, about 95% of the region’s surface area falls between 75’ and 123’, with both the higher and lower extreme elevations being very scarce.

*Neighboring regions:* The Llano is bounded on three sides, to the east lies the alluvium-dominated Wright Region with its headwaters to Colgan, Roseland and Irwin; to the south lies the Cotate Region with waterways running parallel to the boundary; to the west lies the Laguna, recipient of the creeks traversing the Llano.

*Climate:* Annual rainfall in the region averages from 27–35”. The driest parts of the region are in the southeast, along either side of Stony Point Road. Greater rainfall occurs in the small area to the east adjacent to Taylor Region, with slightly more than 35” occurring annually. To the northwest, between Llano Road and the Laguna de Santa Rosa’s main channel, annual precipitation averages about 33”. Summertime winds in the Llano Region, which typically come from the south, are prevalent only in the afternoon. Winter air is often stagnant and warm, and is punctuated by storm-bearing winds that typically arrive from the northwest.

*Impervious surface:* Approximately 5195 acres or 36% of the region’s surface area is covered with some type of impervious surface. 308 acres of this are considered to be more than 75% impervious (complete), 815 acres are considered to be between 50% and 75% impervious (heavy), 1309 acres are considered to be between 25% and 50% impervious (partial), and 2764 acres are considered to be between 1% and 25% impervious (light). The remaining 9423 acres have not been built on or paved. The estimated canopy cover for the region is 3%.

*Ownership:* The Sonoma County Assessor lists 6048 distinct parcels for the region, of these 95% are smaller than nine acres in size. There are 224 parcels greater than ten acres in size comprising 50% of the land in this region.

*Parks:* The principal parks of the region which are open to the public include trails along Sonoma County Water Agency’s channels and small urban parks on the outskirts of Santa Rosa. All existing parks are urban parks, but this is likely to change in the future. There are plans for public

access at properties owned by the City of Santa Rosa including Stone, Kelly, Brown, and Alpha Farms, which are held under Open Space District conservation easements.

*Habitat protection:* 1620 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are portions of farms owned by the City of Santa Rosa including Stone, Kelly, Brown, and Alpha Farms, the Department of Fish and Game's Laguna Ecological Reserve, the Wildlife Conservation Board's Wright Preservation Bank between Hall Road and Occidental Road, and several miles of Sonoma County Water Agency channels. Protected properties with habitat value comprise 11% of the land in this region.

*Creeks and ponds:* The region is drained through 15.8 miles of named creeks and 28.6 miles of unnamed creeks and swales. There are 56 ponds in the region totaling 141.6 acres in size. Notable among these are the Brown Farm water storage pond and portions of the holding ponds at the Llano sewage treatment plant.

### LOS GUILICOS

This region is the fertile valley leading eastward from Santa Rosa toward the town of Sonoma. Squeezed between two mountainous areas, Bennett Mountain to the south, and Hood Mountain to the north, the broad flanks of this valley provide a gentle character that is in direct contrast with its neighbors: the resulting vistas give the first time visitor a picture of grandeur. This valley provides the only natural pass through the extended range of mountains bordering Napa, Lake, Mendocino, and Sonoma Counties. Early pioneers used this pass as the natural gateway between Mission San Francisco Solano in Sonoma and the frontier ranchos on the Russian River.

*Area:* 1169 acres (2.53 mi<sup>2</sup>).

*Topography:* Water reaches Los Guilicos Region from the adjacent slopes of the steep mountainsides to the north and south. Creeks coming off these two mountains approach each other head-on, reaching a point of indecision, where water could flow east toward Sonoma Creek or west toward Santa Rosa Creek, before reaching the low spot, Oakmont Creek, after decid-



ing on a westward flowing course. The region has a mild topographic character with Meadowridge, a small hill rising 140' above the plain, constituting the only exception to the otherwise flat terrain. The region's average slope is 3.0%, with one-tenth of its surface area having a slope greater than 8.7%. The region's average elevation is 428' with its lowest point at 309' and its highest point at 623'. With a standard deviation of 52', about 95% of the region's surface area falls between 335' and 521', an even distribution of elevations throughout.

*Neighboring regions:* East of Los Guilicos the headwaters of Sonoma Creek form the eastern boundary of the Laguna's watershed. This eastern frontier is difficult to distinguish when in the field, probably due to the apparent dwarfing of the lowlands by the nearby towering mountains. North of Los Guilicos is the Foothills Region which rises abruptly at the boundary between the two regions. South of Los Guilicos is the eastern arm of the Matanzas Region. The region's natural exit, to the west, is where Oakmont Creek joins Santa Rosa Creek at the constricted entrance to the Cabeza Region.

*Climate:* Annual rainfall in the region averages from 33–37". Lower precipitation values are found in the west near the Cabeza Region, slightly higher readings are found to the east towards the Sonoma Valley headwaters.

*Impervious surface:* Approximately 987 acres or 61% of the region's surface area is covered with some type of impervious surface. Six acres of this are considered to be more than 75% impervious (complete), 152 acres are considered to be between 50% and 75% impervious (heavy), 238 acres are considered to be between 25% and 50% impervious (partial), and 590 acres are considered to be between 1% and 25% impervious (light). The remaining 632 acres have not been built on or paved. The estimated canopy cover for the region is 21%.

*Ownership:* The Sonoma County Assessor lists 2190 distinct parcels for the region, of these 95% are 3 acres or smaller in size. There are 22 parcels greater than ten acres in size, comprising 37% of the land in this region. The largest parcel by far, at 239 acres, is the Los Guilicos juvenile detention center held by the County of Sonoma.

*Parks:* There are no public parks and no plans for public access in the future at any properties in this region.

*Habitat protection:* 136 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are a State of California Land Bank property at Highway twelve and Melita Road and the prop-



erty surrounding the Los Guilicos juvenile detention facility. Protected properties with habitat value comprise 8% of the land in this region.

*Creeks and ponds:* The region is drained through 5.3 miles of named creeks and 5.4 miles of unnamed creeks and swales. Santa Rosa Creek passes through the Los Guilicos region, and the headwaters of Oakmont creek are located here. There are eight ponds in the region totaling 17.7 acres in size. Notable among these is a 9.7 acre reservoir at the Hill Ranch. The remaining ponds each measure less than two acres in size.

### MATANZAS

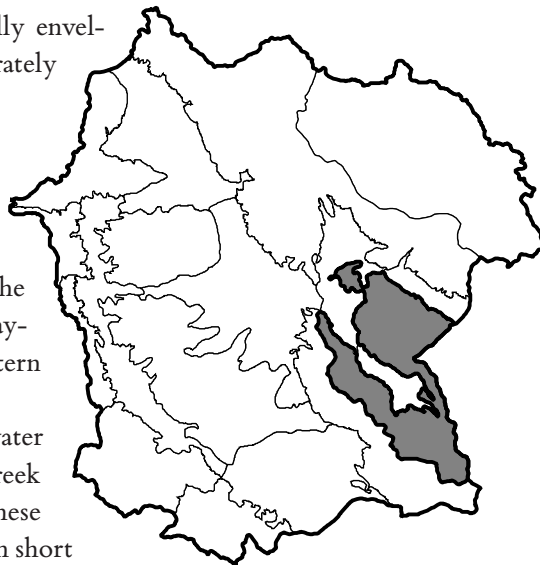
This region contains the high mountainous areas in the watershed's southeastern corner. Most of the region's rainfall flows through tributaries running in a northwest direction through Matanzas Creek and Spring Creek. The Matanzas region is home to Taylor Mountain along its western frontier, Sonoma Mountain in the south, and Bennett Mountain in the east. The region is notable for the rugged beauty of its landscape and has been the target of open space acquisitions for several decades: most of the region's northeast arm is under the stewardship of Annadel State Park, while much of the region's southernmost lands are held in public trust through the Sonoma County Agricultural Preservation and Open Space District. From north to south the region is more than nine miles in length, and is split into western and eastern arms. The region's western arm is between one-half and one full mile in width. The region's eastern arm is only about one-half mile in width at its base, but bulges to nearly four miles in width in the Annadel section.

Bennett Valley Region is almost wholly enveloped by this region, and is described separately because of its distinctly flatter topography.

*Area:* 12,137 acres (18.96 mi<sup>2</sup>).

*Topography:* The western arm of the region drains off high hills, through steep well-defined valleys with easterly trending watercourses; water from this arm enters the north-flowing Matanzas Creek. At 1401' Taylor Mountain is the highest point in this western section.

The southern section has two major water courses: the South Fork of the Matanzas Creek and the Matanzas Creek proper. Both of these main waterways flow towards the north with short





steep tributaries entering through well-defined valleys entering from the east and west. At 2463' Sonoma Mountain is the topographic capstone of the region.

The eastern arm drains west and north through different sub-watersheds. The southern portion of the eastern arm flows towards the Bennett Valley Region. These southern tributaries are among the steepest descents in the watershed dropping 1300' in only three-fourths of a mile. The northern portion of the region, in contrast to the rest of the Matanzas Region, drains through Spring Creek, which flows northwest through Lake Ilsanjo on its way to eventually joining Matanzas and Santa Rosa Creeks. The headwaters of Spring Creek begin between Bennett Mountain's 1887' peak and the unnamed 1427' peak just to the northeast. A small portion of the eastern arm's northernmost, lower elevations drains through Oakmont Creek.

The region's average slope is 12.9%, with one-tenth of its surface area having a slope greater than 26.1%. The region's average elevation is 871' with its lowest point at 195' and its highest point at 2463'. With a standard deviation of 406', about 95% of the region's surface area falls between 336' and 1759', with the higher elevations being somewhat less prevalent.

*Neighboring regions:* To the west and south, the Taylor Region drains water directly towards the Santa Rosa Plain. To the east and south, Sonoma Creek's upper watershed begins its long course directly to the San Francisco Bay. The flat fertile Los Guilicos and Cabeza regions wrap around the northeastern and northwestern frontiers. The Bennett Valley Region is carved out of the central area of Matanzas Region.

*Climate:* Annual rainfall in the region averages about 40 inches. A slight gradient of measured precipitation is noticeable moving from the region's southern average of 45" per year to its northern average of 35" per year. This is the only region where the south is wetter than the north. Each of the region's three mountain peaks also record locally higher annual averages with an annual difference from peak to valley of about 5".

*Geology:* Almost the entire region is underlain with bedrock. Four small pockets of alluvium exist, two along the South Fork Matanzas Creek, one adjacent to Lake Ilsanjo, and a fourth along an unnamed tributary of Oakmont Creek.

The Rodgers Creek Fault, an active Holocene-period fault, runs in and out of the western edge of the upper region for about five miles, before trending just outside the lower edge of the region's southeastern boundary.

A long, unnamed, Quaternary-period fault, in the Bennett Valley fault zone, runs through the centerline of the region's eastern arm. To the north, and forming a contiguous extension, three Late Quaternary-period faults run parallel to each other in the middle reaches of Spring Creek.

Near the southern end of the region, a rare east-west trending fault, approximately 10,500 feet in length, is located at the base of Sonoma Mountain. A shorter northwest trending fault can be traced from the peak itself to the headwaters of Matanzas Creek.

*Impervious surface:* Approximately 1477 acres or 12% of the region's surface area is covered with some type of impervious surface. Two acres of this are considered to be more than 75% impervious (complete), 29 acres are considered to be between 50% and 75% impervious (heavy), 170 acres are considered to be between 25% and 50% impervious (partial), and 1275 acres are considered to be between 1% and 25% impervious (light). The remaining 10,666 acres have not been built on or paved. The estimated canopy cover for the region is 53%.

*Ownership:* The Sonoma County Assessor lists 2112 distinct parcels for the region, of these 95% are smaller than 14 acres in size. There are 37 parcels greater than 50 acres in size, comprising 65% of the land in this region. Notably large properties include Annadel State Park and Howarth Park, plus several privately held properties greater than 200 acres on Taylor Mountain.

*Parks:* The principal parks of the region which are open to the public include Annadel State Park and Howarth Park. Most existing parks are wildland parks. There are plans for public access in the future at seven properties totaling 464 acres in this region, which are held in fee or under greenbelt or recreation easements by the Open Space District. These include Jacobs Ranch, Coopers Grove, the Bath-Watt property, a property adjacent to Annadel State Park, and several properties linking the Sonoma Mountain Trail Corridor.

*Habitat protection:* 5140 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are Annadel State Park, Open Space District properties including Jacobs Ranch and Coopers Grove, the Wilroth Addition to Sonoma State University's Fairfield Osborn Preserve, and the Sonoma Mountain Woodlands Regional Park. Protected properties with habitat value comprise 42% of the land in this region.

*Creeks and ponds:* The region is drained through 5.1 miles of named creeks and 29.2 miles of unnamed creeks and swales. The headwaters of

Spring Creek and Matanzas Creek are both found in this region. There are 18 ponds in the region totaling 70.9 acres in size. Notable among these are Lake Raphine and Lake Ilsanjo, both located in public parkland.

*South Fork Matanzas beginning at the headwaters:* The highlands of the South Fork gather forest runoff from the west-facing slopes of Sonoma Mountain. Much of this area is public open space: this is the Wilroth Addition to the Fairfield Osborn Preserve. Nearby, but outside the Laguna Watershed, are Jack London State Park and Sonoma Mountain Ranch Conservation Easement.

*Note: Creek mileage markers use a reference point at Jenner where the Russian River meets the Pacific Ocean. For example, a point on a creek labeled ~50.33 is about 50 1/3 miles from the ocean.*

One small water body marks the beginning of the South Fork at ~50.32. After being joined by three short tributaries from the southwest at ~50.10, ~49.97, and ~49.79, the South Fork leaves the protected woods at the end of Lichau Road to cross a 164-acre privately owned open field. Towards the north end of this parcel the creek begins a rapid descent through a steep and narrow valley trending north. This constricted valley continues onto the SCAPOSD Coopers Grove and Jacob Ranch. Woodlands dominate the area in an unbroken stretch that is more than a quarter-mile wide in parts. To the northwest, the woodlands flanking the creek narrow considerably, but still maintain an average width of about 400'.

At ~48.32 a half mile long tributary joins from the northeast. Two large parcels that are almost entirely in grape production are situated south of Sonoma Mountain Road. The riparian cover is approximately 80' wide here. One small ponded area is situated about halfway down this tributary. One medium-sized, 8-acre parcel with dense woods reaching, in parts, to almost 450' in width, forms the final stage of the tributary.

At ~48.01 a tributary, two-thirds of a mile in length enters from the northeast. The rural residential parcels north of Sonoma Mountain Road and south of Mary Paige Lane are each between 14 and 40 acres in size. The first of the five parcels has cultivated grapes, the next two are open fields with no riparian vegetation, and the final two are open fields with broken vegetative cover that never exceeds 50' in width. Two small ponds, located at ~48.25 and ~48.48 interrupt the water's flow.

Between ~48.01 and ~47.04 the South Fork changes direction by following a wide arc bending from west to north. In this reach, the creek crosses seven parcels, four of them medium sized, from 3- to 5-acres each. These medium-sized parcels are rural residences accessed from Sonoma Mountain Road; running adjacent to the road, the creek is fully envel-

oped in a 120' wide riparian canopy. The first of the large parcels is a 34-acre largely undeveloped site notable because the tree cover widens to about 200'. A 4-acre rural residential parcel with similar tree cover is next, followed by an 85-acre parcel notable for its scanty tree cover.

At ~47.04 a three-quarter mile long tributary enters from the east. This waterway forms from two forks, one north and the other south of Sonoma Ridge Road. The upper part of this waterway is split among four 40-acre parcels, two are partially used for hay production, and the other two are modestly covered in trees. A small pond is impounded in-stream on the northeast parcel. The lowest parcel, 85-acres in size, is lightly covered in trees flanking the waterway; a small pond is situated in-stream.

At ~46.56 a mile-long tributary enters from the south. This tributary forms in a 164-acre highlands site and gathers its waters among a 600' wide forested area. Immediately north of this seminal parcel, the tributary flows through a long series of 1- and 2-acre home-sites situated along Hidden Acres, Hidden Springs, and Hidden Oaks Roads. True to their namesake, all of these small parcels are blanketed in dense forest cover.

At ~46.46 a half mile long tributary enters from the southwest. The 71-acre open field south of Peracca Road is mostly open uncultivated land. North of Peracca Road the tributary cross four parcels, ranging in size from five to ten acres, all of which are heavily forested.

At ~46.19 a short tributary, with 200' wide riparian cover, enters from the west after crossing one large uncultivated property and one medium-sized undeveloped parcel.

At ~45.95 a one-third mile long tributary enters from the west. The upper part of this waterway crosses an open field with some light scarring evident before entering the wooded region of its broad lower valley.

At ~45.60 a one mile long tributary enters from the west. The uplands of the tributary west of Grange Road are gently rolling: they are used for extensive grape-growing. The waterway flows through the vineyards with very little riparian cover and only a narrow grass setback. East of Grange Road the waterway crosses a 34-acre parcel, without any riparian cover, before entering a 20-acre parcel with light but wide-spread tree canopy.

Matanzas Creek proper joins the South Fork at ~45.42.

*Western tributaries of Matanzas Creek downstream of ~45.42:* At ~44.10 a tributary, about one and a quarter miles in length, enters Matanzas Creek from the west. This waterway starts in two forks formed along the north-south ridgeline of Taylor Mountain. The south fork flows through an impounded section between ~45.31 and ~45.28 situated just below the summit. This south fork falls entirely within a 334-acre parcel.

The origins show some small surface scars above the impoundment near the mountain's bald top. Immediately below the pond the waterway dives into a heavily wooded area. It joins with its north fork at  $\sim 44.94$ . The north fork, as well as the entire lower reach of the combined tributary is situated on a single 474 acre parcel. This entire area is thickly wooded. The tributary joins the Matanzas at  $\sim 44.10$  in a parcel owned by the Sonoma County Water Agency. This part of Matanzas Creek is dammed to form the 10-acre Matanzas Creek Reservoir.

At  $\sim 43.12$  a one and a quarter-mile long tributary enters from the west. This tributary starts in a split fork along the eastern side of the Taylor Mountain ridgeline. The highlands are bald-topped and undeveloped. Both forks form amid thick woods before joining at  $\sim 43.97$ . The combined forks travel north and east for about one-third mile through thick woods, all of which is held in a single 262-acre parcel. The remainder of the tributary passes through three medium-sized parcels, of 10- to 15-acres in size, but of diminished woodland and riparian character, in some stretches narrowing to about 100' in width. Parallel to the tributary and on its left bank is a single 30-acre undeveloped parcel, wooded in the upper reach and open field in the lower reach.

North of  $\sim 43.12$  the region's western frontier slopes down, rapidly losing elevation, before petering out to a point jutting into the neighboring Carrillo Region. The upper ridgeline is wooded. Immediately below the wooded crest are the urban fringes of the city of Santa Rosa. This area remains well-populated with trees but is split into 750 rural residential and urban residential parcels. Sheet flow leads to storm drains which gather in the east into Lornadell Creek. One small tributary at  $\sim 41.13$  drains the half mile long stretch between Holland Drive, Verde Vista Drive and Valley View Drive.

*Matanzas Creek beginning at the headwaters:* The headlands of Matanzas Creek begin on Sonoma Mountain amid several publicly owned open space parcels and conservation easement parcels including the Skiles and Wilroth parcels, the Sonoma Mountain Woodlands, and the Sonoma Mountain Trail Corridor. The Jack London Ranch State Park is located just over the ridgeline.

Starting at about  $\sim 49.87$ , Matanzas Creek flows north through the heavily wooded area of the Sonoma Mountain Woodlands and Cooper's Grove. South of Sonoma Mountain Road, beginning near  $\sim 48.83$ , the creek opens up to mixed meadows and scrublands, passing through two large parcels, 60- and 55-acres in size.

At  $\sim 48.41$  a short tributary, flanked by a 200–300' wide riparian woodland, enters from the east.

At  $\sim 47.95$  a half mile long tributary enters from the southeast. It is mostly protected by a 200' to 300' wide riparian woodland. This is the area west of Molinari Road, and is split into three medium-sized rural residences to the northeast with mixed woods, and one 18-acre parcel to the southwest of which about half is used for grape cultivation.

Between  $\sim 47.95$  and  $\sim 47.30$  Matanzas Creek opens into a broad valley. The creek crosses a 28-acre undeveloped parcel situated on the right bank and a 107-acre mostly undeveloped parcel on the left bank. Riparian cover in this reach narrows to between 150' and 250' feet in width.

At  $\sim 47.30$  a short tributary enters from the east, forming west of Bennett Valley Road amid a sparsely populated woodland. This tributary is impounded between  $\sim 47.57$  and  $\sim 47.49$ . Some minor surface scarring is evident immediately after leaving the pond.

Between  $\sim 47.30$  and  $\sim 46.99$  Matanzas Creek moves through an increasingly wide valley flanked on both sides by large vineyards. This stretch of the creek has riparian cover that is no more than 100' wide.

Beyond  $\sim 46.99$  the creek enters the Bennett Valley Region.

The southern fork of the tributary entering Matanzas at  $\sim 46.50$  runs parallel to Bennett Valley Road. Between  $\sim 47.56$  and  $\sim 47.40$  the tributary is impounded. Most of the water for this tributary reaches it from the very steep Bennett Ridge to the east, zoned as Resources and Rural Development, and owned privately in 10- to 40-acre parcels. This hill is of mixed woods and open fields.

The northern fork of the  $\sim 46.50$  tributary, bifurcates above  $\sim 47.27$  receiving its waters from the steep slopes of Bennett Ridge. This entire area is part of a 196-acre undeveloped parcel lying directly adjacent to Annadel State Park. This area transitions from lightly wooded to densely wooded moving from east to west.

The tributary that eventually joins Matanzas Creek at  $\sim 44.98$ , starts at  $\sim 46.33$  amid the steep slopes and dense forest of Bennett Ridge. It is joined by two other similar tributaries running off the steep slopes and joining at  $\sim 45.63$  and  $\sim 45.49$ . The lower portions of these cross vineyards running through grassy swales.

The tributary that joins Matanzas at  $\sim 44.43$  also begins on the Bennett Ridge slopes before running for about a half mile across a vineyard through a grassy swale. After crossing Bennett Valley Road the waterway fills a small pond, then exits to cross more cultivated grapes through another grassy swale.

The tributary that joins Matanzas at  $\sim 43.29$  forms in three forks amid Bennett Ridge's scattered to heavy woods. This is the Geary Ranch SCAPOSD easement and the Geary Ranch addition to Annadel State Park. After leaving the public open space areas, the tributary crosses three medium-sized parcels, 11- to 14-acres in size, each of which are rural residences with lightly scattered woods. East of Bennett Valley Road, the tributary crosses five medium sized 8-acre rural residences and one oddly-shaped 55-acre. The riparian cover is scanty to none in the lower part of this reach.

The tributary at  $\sim 43.27$  forms in the Geary Ranch addition to Annadel State Park before skirting the northern edge of the Keegan & Coppin SCAPOSD easement. Four of the five medium-sized parcels that the tributary crosses are undeveloped. This entire tributary passes through thick woods which are never less than 300' wide.

*Spring Creek:* The upper reaches of Spring Creek form in Annadel State Park amid very dense woods. These tributaries flow east before gathering into Lake Ilsanjo. The middle tributary above  $\sim 46.52$  is notable for the steepness of its valley sides; the others are broader and shorter. Lake Ilsanjo is situated amid a flat bald terrace. From  $\sim 44.60$  to  $\sim 42.61$ , Spring Creek continues to flow downhill through a steep-sided valley dropping in elevation 750' to 325' over the 2-mile distance.

At  $\sim 42.61$  water from Spring Lake joins Spring Creek from the north after leaving Spring Lake Regional Park and passing through land administered by the Sonoma County Water Agency. This waterway passes through an unforested terrace at the base of Annadel State Park.

Spring Creek leaves the Matanzas Region entering the Carrillo Region after passing through a City of Santa Rosa parcel which is the site of a water tank.

*Lake Ralphine area:* Howarth Memorial Park and the western half of Spring Lake Regional Park are included in the Matanzas Region rather than the Carrillo Region because of its knob-like feature. The hills here remain above the nearby alluvial plain of Santa Rosa Creek. Lake Ralphine is fed by a short tributary reaching towards nearby Spring Lake. Only the center strip of this area is in public ownership, and all of it is heavily wooded. In contrast, to the north, the steep slopes hold an enclave of 120 urban homes on half-acre plots, while to the south the hills are populated by 300 slightly larger, three-quarter acre, urban homes.

*Southern tributaries of Oakmont Creek:* At  $\sim 47.07$  a short tributary enters Oakmont Creek from the south. The tributary's headwaters form in the northern shadow of Annadel State Park. The area is notable for the large



expanse of dense woods held in common by the Wild Oak Homeowners Association. The waterway is pristine until it reaches  $\sim 47.35$  where it is diverted underground before emerging again at  $\sim 47.24$ . From  $\sim 47.24$  to its confluence with Oakmont Creek, the tributary crosses a golf course. The uncovered grassy swale here feels out-of-place compared to the dense canopy of the upper reach.

At  $\sim 46.21$  a one and a half mile long tributary enters Oakmont Creek from the south. It starts in Annadel State Park heading eastward amid dense forest before turning north to skirt land managed by the Wild Oak Homeowners Association. This stretch parallels Two Quarry Trail and White Oak Drive. At  $\sim 46.58$  a half mile long tributary joins from the west after passing through the heavily wooded Annadel. After crossing White Oak Drive the tributary threads its way north through a park and saddle club. This area is thinly covered in trees. The final 700' of the tributary, prior to joining Oakmont Creek, is protected with a 100' wide tree cover.

The tributary entering Oakmont Creek at  $\sim 45.65$  has the same pristine character as the other waterways of Annadel.

*Southern tributaries of Santa Rosa Creek:* The two-thirds mile-long tributary entering Santa Rosa Creek at  $\sim 45.05$  originates in the north-facing hills of Annadel. It passes through dense forest cover for its entire span.

The mile-long tributary entering at  $\sim 44.81$  begins in the open, saddle-like expanse between Live Oak Trail and Orchard Trail. The water descends through a constricted valley with dense woodlands to the east and scrublands to the west.

*Assessment:* Matanzas Region has attracted special attention over the years for its rugged beauty. Through the acquisition and maintenance of the region's numerous conservation lands, both public and private, the region has enjoyed the very best protections. Nearly all of the region's waterways are well protected by riparian vegetation or mixed oak woodlands. Very large parcels also dominate the region providing an easy path for like-minded owners who share a common conservation ethic.

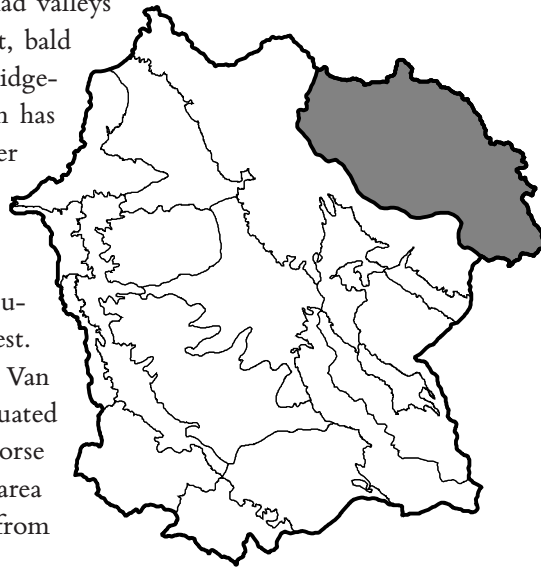
A few newer vineyards still show signs of early cultivation activities. With attention to detail and application of best management practices for erosion control and riparian setbacks, these minor setbacks could easily be reversed.

### MONTANE

This region is the mountainous area collecting the headwaters to Porter, Mark West, and Santa Rosa creeks, whose waters all flow downstream into the adjacent Foothills Region, situated to the west and south. Rugged landscapes and large tracts of wildlands are the norm, with a few scattered ranching operations and rural residences established along the occasional, wide valley bottoms. Forestry and fire management are key concerns, with erosion and invasive plants being high on the list of management concerns as well. Due to the high elevations of the region, this is both the wettest and the coldest part of the Laguna's watershed. The region extends more than ten miles in length from southeast to northwest, while varying from three to five miles in width. This vast area remains largely inaccessible, being served by Petrified Forest and Sharpe roads in the north, Calistoga and St. Helena roads through the center, and Timberline Drive in the south; numerous steep, private, unpaved roads provide owner access.

*Area:* 23,248 acres (36.33 mi<sup>2</sup>).

*Topography:* Steep, well-defined, tree-clad valleys are found throughout the region, with flat, bald mountain tops situated along many of the ridge-lines. The northwestern part of the region has westward trending creeks draining into Porter and Mark West creeks. The southeastern part of the region has more southerly trending waterways draining into upper Santa Rosa Creek. Diamond Mountain is situated south of Porter and north of Mark West. Castle Rock is situated between Salt Creek, Van Buren, and Weeks creeks. Sugarloaf is situated in the area between Humbug and Deadhorse creeks. Gates Canyon is carved into the area north of Sugarloaf by the waters flowing from nearby Big Spring.



The region's average slope is 18.8%, with one-tenth of its surface area having a slope greater than 34.2%. The region's average elevation is 1357' with its lowest point at 492' and its highest point at 2730'. With a standard deviation of 405', about 95% of the region's surface area falls between 754' and 2074', an even distribution of mountains and valleys.

*Neighboring regions:* Towards the northeast, the region crests along a ridgeline dividing the Pacific-flowing waters of the Laguna de Santa Rosa

and the San Francisco Bay-flowing waters of Simmons, Ritchie, Heath Canyon, and York creeks. At the very northern frontier, the Upper Franz Creek basin flows towards the Russian River. The region's southwestern border, dividing the Montane from the Foothills, is arbitrarily drawn along the ridgeline which separates the upper Mark West watershed from the tributaries that feed Paulin, Brush and Austin creeks, except for the portion of the frontier that divides Santa Rosa Creek into an upper and lower watershed.

Sugarloaf Ridge State Park is situated just inside the watershed in the upper Santa Rosa headwaters. McCormick Ranch straddles the divide between the Montane and nearby Heath Canyon. Both Napa Valley State Park lies partially within the region straddling at Ritchie Creek. Hood Mountain Regional Park lies to the south, just outside the region, in the Foothills. The Petrified Forest, along Porter Creek is just inside the watershed.

*Climate:* Average annual rainfall in the region varies considerably from a low of 39" to a high of 62". The adiabatic effect, which causes air temperature to drop in relation to the decreased pressure seen at higher elevations, is the principal cause for the region's variable precipitation. The wettest parts of the Montane Region are the high elevations of the Van Buren Creek and Salt Creek headwaters, which can receive more than 60" of rain annually. Less precipitation falls in southwest, along Mill Creek and Weeks Creek, which can receive as much as 45–50" annually. Neal, Deadhorse, upper Porter, and upper Santa Rosa Creeks, all running off the region's northwestern highlands, also receive similar amounts of rain, from 40–50" per year. Much of the region's extra precipitation arrives in the form of the light misty rain that is classically associated with the Redwood Empire.

On the rare occasions when temperatures drop below freezing, this is one of the watershed's first regions to receive a light dusting of snow instead of rain. Overall, this region receives almost twice the amount of rainfall that is received in the southern portion of the watershed.

*Impervious surface:* Approximately 739 acres or 3% of the region's surface area is covered with some type of impervious surface. None of this is considered to be more than 75% impervious (complete), less than one acre is considered to be between 50% and 75% impervious (heavy), six acres are considered to be between 25% and 50% impervious (partial), and 733 acres are considered to be between 1% and 25% impervious (light). The remaining 22,520 acres have not been built on or paved. The estimated canopy cover for the region is 72%.

*Ownership:* The Sonoma County Assessor lists 885 distinct parcels for the region, of these 95% are smaller than 126 acres in size. There are 126 parcels greater than 50 acres in size comprising 72% of the land in this region.

*Parks:* The principal parks of the region which are open to the public include a portion of Hood Mountain Regional Park, Sugarloaf State Park and the McCormick Addition, and part of Boothe State Park. All existing parks are wildland parks. There are no plans for future public access to properties in this region.

*Habitat protection:* 3689 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are Hood Mountain Regional Park, Sugarloaf State Park and the McCormick Addition, the Sonoma Land Trust's Nefertierra easement, and the Saddle Mountain easement held by the Open Space District. Protected properties with habitat value comprise 16% of the land in this region.

*Creeks and ponds:* The region is drained through 34.3 miles of named creeks and 28.7 miles of unnamed creeks and swales. It includes the headwaters of Santa Rosa and Mark West Creeks. There are 26 ponds in the region totaling 24.8 acres in size. Most ponds are less than two acres in size, with one notably large pond of 5.3 acres east of Foothill Ranch Road.

#### PINER

This upper extension to the great Santa Rosa Plain, shares much of its geographic character with its larger cousin, the Llano. But for the extensive and wide alluvial deposits along Santa Rosa Creek, the Llano and Piner might be considered one region. For the most part the region is topographically flat, with shallowly defined water courses; it has a simple mixture of soils types with drainage that is moderate to poor. The oval-shaped region is about four miles long and two miles wide. Waterways flow southwest towards Santa Rosa Creek, generally through natural channels, but through levee-protected channels in short reaches of Peterson and uppermost Abramson creeks.

*Area:* 6724 acres (10.51 mi<sup>2</sup>).

*Topography:* The most interesting and distinctive feature of the region is the active fault line which cuts the region into two halves; it runs from the intersection of Woolsey and Olivet roads diagonally southeast to the corner of Piner Rd extension (across from Winberie Knolls). This uplifting fault raises the eastern plain up above the western plain, providing



some moderate topographic interest where Abramson and Peterson Creek erode the escarpment.

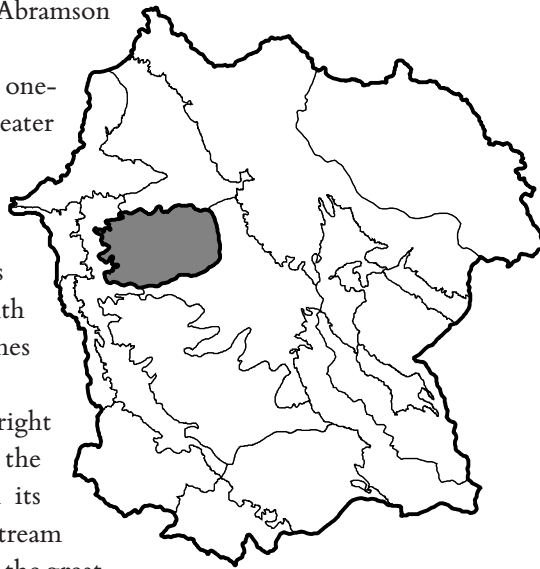
The region's average slope is 1.1%, with one-tenth of its surface area having a slope greater than 3.2%. The region's average elevation is 116' with its lowest point at 60' and its highest point at 178'. With a standard deviation of 21', about 95% of the region's surface area falls between 82' and 144', with both the higher and lower elevation extremes being somewhat less prevalent.

*Neighboring regions:* To the south, Wright Region carries the accumulated waters of the Matanzas and Santa Rosa creeks through its historically meandering and bifurcating stream system. To the north, the San Miguel carries the great waters of Mark West through its wide field of basin deposits. To the west, the Laguna Region directly receives water through four short, formerly unnamed creeks, which we've christened (from north to south) Rued, Bailiff, Atkinson, and Illingsworth.

*Climate:* Annual rainfall in the region averages about 31–34". The lack of topographic highlights in the regions adjacent to Piner, is reflected in its uniform rainfall pattern. Being generally well-protected from the afternoon coastal air current, the region is characterized by slightly warmer summer evenings than its southern counterparts. Morning fog occasionally occurs along creekside low spots, but dissipates somewhat sooner than the nearby Llano.

*Geology:* This region is entirely underlain by bedrock of the Glen Ellen Formation. It has no recent alluvial deposits. The short streams which originate in this region and flow south to Santa Rosa Creek or west to the Laguna-Mark West complex are probably no more than human enhancements to the region's drainage. The presence of vernal pools, especially in the northeastern half, above the geologic fault line escarpment, provides a further clue towards unraveling the region's mystery, suggesting a strong resemblance to the well-known character of the nearby Llano Region.

*Impervious surface:* Approximately 2572 acres or 38% of the region's surface area is covered with some type of impervious surface. 23 acres of this are considered to be more than 75% impervious (complete), 475 acres are considered to be between 50% and 75% impervious (heavy), 749 acres are considered to be between 25% and 50% impervious (partial), and 1324



acres are considered to be between 1% and 25% impervious (light). The remaining 4155 acres have not been built on or paved. The estimated canopy cover for the region is 4%.

*Ownership:* The Sonoma County Assessor lists 4141 distinct parcels for the region, of these 95% are 5.5 acres or smaller in size. There are 60 parcels 20 acres or larger in size, comprising 37% of the land in this region.

*Parks:* The only park in this region which is open to the public is the Youth Community Park near Piner High School. There are presently no plans for additional public access in this region.

*Habitat protection:* 190 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are the Alton Lane and Piner Road vernal pool preserves. Protected properties with habitat value comprise 3% of the land in this region.

*Creeks and ponds:* The region is drained through 5.4 miles of named creeks and 12.9 miles of unnamed creeks and swales. Abramson Creek is the longest creek in this region. There are 15 ponds in the region totaling 20.3 acres in size. All ponds are less than 2.5 acres in size, with the exception of a 5.4 acre agricultural pond along Woolsey Creek.

#### RIVER

This is the region located at the north-west corner of the watershed and situated where the Mark West-Laguna complex joins with Windsor Creek just prior to the final confluence of the combined watersheds with the Russian River proper. This “Y” shaped region contains three somewhat distinct subregions: the northeast branch, which is drained by Windsor Creek, is about a mile wide and two miles long; the southeast branch, which sits in a high plain between Mark West and Laughlin creeks, is triangular in shape, being about two miles long and about one mile wide at its base; the western branch is also about two miles long and one mile wide, tapering to a point at the confluence with the Russian River.

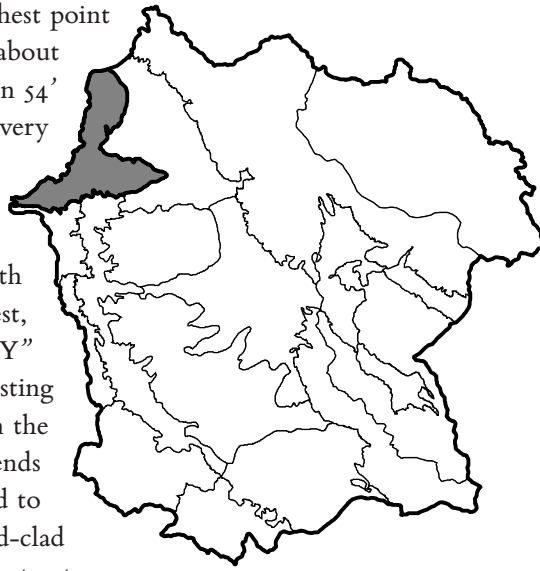
*Area:* 6190 acres (9.67 mi<sup>2</sup>).

*Topography:* Each of the three subregions is topographically expressive in a different way: the northeast branch has well-defined valleys sending their waters south and west towards Windsor Creek; the southeast branch is a flat, undrained plain, reminiscent of the Llano and Piner regions; the eastern branch consists of a broad fertile valley opening onto the Russian River.

The region's average slope is 3.4%, with one-tenth of its surface area having a slope greater than 10.2%. The region's average elevation is

113' with its lowest point at 21' and its highest point at 277'. With a standard deviation of 40', about 95% of the region's surface area falls between 54' and 204', with the higher elevations being very scarce.

*Neighboring regions:* To the northeast lie the "Mirabel Park" and the "Adam and Eve Redwoods" watersheds, which are both reaches of the Russian River itself. To the west, hugging the tips and the crotch of the "Y" lies the San Miguel Region and its interesting deposits of basin alluvium; to the south, in the middle, the Laguna-Mark West complex sends its accumulated waters into this region; and to the southeast, the steep hills of the redwood-clad Forestville region confine the outbound water to a constricted course somewhat north of what would otherwise be expected.



*Climate:* Average rainfall for the region ranges from 34–41" per year. The variation in measured precipitation occurs evenly from the wettest areas in the west, at the confluence of the Laguna de Santa Rosa and the Russian River, to the driest areas in the east, below the Sonoma County Airport. The light misty rains, so characteristic of the nearby Green Valley, Mirabel Park, and Adam and Eve Redwoods watersheds, occur only in the westernmost extension of the River Region; the western part of the region is much more like the classic Santa Rosa Plain rainfall pattern.

*Geology:* Approximately 84% of this region is underlain by bedrock of the Glen Ellen Formation; another 15% is underlain by very recent undifferentiated alluvial deposits along Windsor Creek; a scant 1% consists of stream terrace deposits along the Laguna de Santa Rosa.

The region's northeast branch has thin ribbons of alluvium under the lower reaches of Starr and Jacobson creeks, and, to a smaller degree, Woody Creek; the remainder of this branch of the region is underlain by bedrock. The southeast branch is very similar, but in this branch only Slusser Creek has a ribbon-wide carpet of alluvium. The area that joins these branches is home to the wide valley and intermingling waters of Windsor and Old Laughlin creeks. Laughlin Creek, which now joins Windsor Creek close to the confluence with Pool, formerly ran in a separate, nearly parallel, path south for another mile and a half before finally joining Windsor; this interesting reach has a 1000–1200' wide alluvial bed.

The eastern branch of the region begins near the confluence of Windsor and the Laguna-Mark West complex. There is a NW-SE fault line crossing at this point; it is an extension of the very visible line that cuts across the neighboring San Miguel Region. The first mile of this Laguna-Mark West reach has very recent deposits of undifferentiated alluvium varying from 500' to 1500' in width; although this is not an insignificant width by itself, it is a much narrower width than both the upstream and the downstream reaches. This is the great Ritchurst Knob constriction which acts as one of the Laguna's floodwater regulators: upstream of this point lies the historic Mark West delta, which through human engineering has been altered several times; downstream of this point the backwater effect of the Russian River is noticeable during major floods.

Near ~26.21 a low hill is situated mid-valley, with alluvial deposits found on either side, but not the hill itself. From that point to the Russian River, a distance of about two miles, the sediment-underlayment widens to between 2500' and 3000'. This final reach of the Laguna-Mark West complex is bordered, on both the north and the south, by alluvial bench deposits, indicating a historic drop in the waterway in the recent geologic past. Indeed a short geologic fault line is present here, cutting through the region on a NW-SE diagonal just before the final confluence with the Russian. This final delta, where the Laguna-Mark West meets the Russian, is almost two miles in width as indicated by these quaternary deposits. Today's channel is confined to the southern extremity of this delta; the northern extremity is used by the Sonoma County Water Agency for its Rainey Collectors which supply fresh water to the bulk of Sonoma County's population.

*Impervious surface:* Approximately 1349 acres or 22% of the region's surface area is covered with some type of impervious surface. 89 acres of this are considered to be more than 75% impervious (complete), 336 acres are considered to be between 50% and 75% impervious (heavy), 362 acres are considered to be between 25% and 50% impervious (partial), and 561 acres are considered to be between 1% and 25% impervious (light). The remaining 4844 acres have not been built on or paved. The estimated canopy cover for the region is 11%.

*Ownership:* The Sonoma County Assessor lists 2590 distinct parcels for the region, of these 95% are between 5.5 and 100 acres in size. There are 22 parcels greater than 50 acres in size comprising 40% of the land in this region.

*Parks:* The principal parks of the region which are open to the public include the Keiser Park and Old Vineyard Park in Windsor. All existing



parks are urban parks. There are currently no plans for additional public access to properties of this region.

*Habitat protection:* 48 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these is a 35 acre Sonoma County Water Agency property on Mark West Station Road. Protected properties with habitat value comprise less than 1% of the land in this region.

*Creeks and ponds:* The region is drained through 3.2 miles of named creeks and 21.3 miles of unnamed creeks and swales. The Laguna de Santa Rosa and Windsor Creek are the primary waterways in this region. There are 29 ponds in the region totaling 45.7 acres in size. Ponds in this region range from 0.1 acres to 4.9 acres in size.

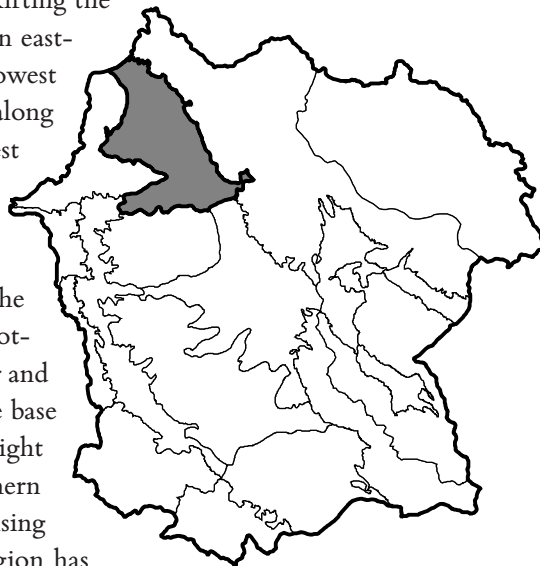
### SAN MIGUEL

Situated at the northern end of the watershed, this region is distinguished by its complex and interesting geologic history, which in recent times has given it a rich underlayment of alluvial deposits. Topographically the region has a mild character; climatologically it is at the mid-point of the watershed's precipitation range, temperatures fall to neither extreme, wind is mild compared to the southern regions, fog is present only on wet winter mornings; hydrologically the region is well-watered and well-drained; overall, San Miguel Region is well-suited to human habitation and agricultural pursuits.

The region has a north-south extent, skirting the Foothills Region, of about six miles; and an east-west extent of one to two miles, in its narrowest range, pushing out to about three miles along Pool Creek and four miles along Mark West Creek.

*Area:* 9547 acres (14.92 mi<sup>2</sup>).

*Topography:* Generally flat, this region has a slight tilt from east to west allowing the waterways which drain the Montane and Foothills to find their way westward to the River and Laguna regions. This region, situated at the base of the Foothills is most similar to the Wright and Cotate regions, but whereas the southern regions are characterized by formerly-avulsing creeks that are now levee-armored, this region has



naturally defined channels which cross the landscape. The four main creeks, Mark West, Shiloh, Pool, and Windsor, each meander across the plain in shallow cuts through the plain's geologically recent alluvium. There are no notable hills or pronounced valleys in the San Miguel Region.

The region's average slope is 1.1%, with one-tenth of its surface area having a slope greater than 4.0%. The region's average elevation is 133' with its lowest point at 65' and its highest point at 274'. With a standard deviation of 31', about 95% of the region's surface area falls between 91' and 195', an even distribution of high and low elevations.

*Neighboring regions:* To the east, the Foothills Region rises sharply out of the plain; to the west, the predominately bedrock-underlain River Region receives the combined waters of Shiloh, Pool and Windsor; to the south, the Piner Region is home to a sparse polka-dot pattern of clay soils and vernal pools. The short common edge between Wright and San Miguel is somewhat arbitrarily chosen, with Wright receiving the waters flowing south through Coffee Creek and San Miguel receiving the waters flowing north toward Mark West Creek. The short common edge between the Laguna and San Miguel is also arbitrary, and could be shifted east or west somewhat without gaining any additional definition.

*Climate:* Annual rainfall in the region averages from 33–43". A gradual change in measurable precipitation is observed from the low of 33" in the southwestern arm, adjacent to the Piner Region, to the high of 43" in the northeastern area, along the edge of the Foothills Region.

*Impervious surface:* Approximately 4771 acres or 50% of the region's surface area is covered with some type of impervious surface. 259 acres of this are considered to be more than 75% impervious (complete), 1281 acres are considered to be between 50% and 75% impervious (heavy), 1392 acres are considered to be between 25% and 50% impervious (partial), and 1839 acres are considered to be between 1% and 25% impervious (light). The remaining 4780 acres have not been built on or paved. The estimated canopy cover for the region is 10%.

*Ownership:* The Sonoma County Assessor lists 8639 distinct parcels for the region, of these 95% are smaller than three acres in size. There are 166 parcels greater than ten acres in size comprising 52% of the land in this region.

*Parks:* The principal parks of the region which are open to the public include Maddux Ranch Regional Park, Esposti Park, and Wilson Ranch Soccer Park. Most existing parks are urban parks. There are presently no plans for additional public access to properties in this region.

*Habitat protection:* 191 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these is the 57 acre Tuxhorn Ranch. Protected properties with habitat value comprise 2% of the land in this region.

*Creeks and ponds:* The region is drained through 20.8 miles of named creeks and 15.4 miles of unnamed creeks and swales. Pool Creek and Windsor Creek are the primary waterways in this region. There are 44 ponds in the region totaling 136.4 acres in size. Notable among these are an 18.6 acre gravel pit in Southwest Windsor and two wastewater storage ponds totaling 33 acres at the Sonoma County Airport.

### TAYLOR

This is the west side of the Taylor Mountain ridge, fronting the Santa Rosa Plain, and running south to Sonoma Mountain. This front range is the headwaters area for the creeks which run westward toward the plain. The ridgeline has rounded shoulders; the valleys have bowl-shaped bottoms, and the descent is unimpeded by cliffs. The shallow canyon-like structures of Crane, Five and Copeland creeks, found at their cross-points to the active Rodgers Creek Fault, provide the major distinctive anomalies to the region. In length the region spans a twelve-mile distance, in width it varies from one to one and a half miles. This region is largely undeveloped by either agriculture or residences; its open tree-studded grasslands provide a welcome and scenic backdrop to the urban residents along the Rohnert Park to Santa Rosa corridor.

*Area:* 8144 acres (12.72 mi<sup>2</sup>).

*Topography:* The entire region is mountainous, with lower elevations occurring in the northwest and higher elevations occurring in the southeast. The entire region's aspect is westward facing.

The region's average slope is 12.7%, with one-tenth of its surface area having a slope greater than 24.8%. The region's average elevation is 877' with its lowest point at 162' and its highest point at 2463'. With a standard deviation of 531', about 95% of the region's surface area falls between 260' and 2135', with the distribution of valleys and peaks being fairly even.



*Neighboring regions:* East of Taylor is the Matanzas Region with its drainage inward towards Bennett Valley. West of Taylor is the level Santa Rosa Plain which we've divided into the Wright, Llano and Cotate regions; these three receive all of the runoff from this region. To the south, the Laguna de Santa Rosa's watershed divide shares its boundary with Lynch Creek watershed, whose waters flow through the Petaluma River to the San Francisco Bay. This southern boundary is crisply defined in the higher elevations near Sonoma Mountain, but becomes increasingly nebulous in the lower elevations as Copeland and Lichau vie for final water rights.

*Climate:* Annual precipitation averages from 34–47" in the Taylor Region. The wettest portions are the high ridgelines of Taylor Mountain and the higher elevations in the south approaching the peak of Sonoma Mountain. The driest portions are the low foothills adjacent to the Cotate Region. Situated in the path of the Petaluma Gap, the region bears the full brunt of the infamous afternoon marine winds.

*Geology:* Approximately 98% of this region is underlain by Sonoma Volcanics bedrock, with only 2% of the area consisting of alluvial deposits. These rare exceptions are found in three small round valleys. The smallest of these is located on Warrington Road, and is inexplicably found close to the ridgetop away from any major creeks; a small pond has been constructed here. The second alluvial patch is on Crane Creek downstream from Pressley Road; this is of more recent composition and begins at a point just 1100 feet downstream from an unnamed geologic fault line. The third, and largest alluvial deposit is also on Crane Creek and is just upstream from the double-line of the Rodgers Creek Fault; it is of older composition than its downstream companion; its nearest access point is Lichau Road.

This region is home to the infamous Rodgers Creek Fault, an active, 35-mile long series of fracture lines which extends along a NNW-SSE axis. Although much of it runs through areas outside Taylor, and indeed outside the Laguna watershed, this region is nevertheless home to the fault's namesake. In the south, this fault is visible as two closely parallel lines extending northward, in a split fashion, for the first two and one half miles. These two closely parallel lines eventually converge near Pressley Road, forming a single line which remains within Taylor up to Guenza Road, when it leaves for a short stint through the Matanzas Region. The fault reemerges into this region north of there in the remote roadless area near Mt. Taylor's summit. On its descent from Taylor Mountain, the fault forms the steep ravines of Rodgers Creek itself, and the fault line leaves

this region at the same point that the creek leaves the region on its way to the Matanzas Creek.

*Impervious surface:* Approximately 576 acres or 7% of the region's surface area is covered with some type of impervious surface. Two acres of this are considered to be more than 75% impervious (complete), 22 acres are considered to be between 50% and 75% impervious (heavy), 65 acres are considered to be between 25% and 50% impervious (partial), and 487 acres are considered to be between 1% and 25% impervious (light). The remaining 7572 acres have not been built on or paved. The estimated canopy cover for the region is 29%.

*Ownership:* The Sonoma County Assessor lists 727 distinct parcels for the region, of these 95% are less than 61 acres in size. There are 82 parcels greater than 20 acres in size comprising 78% of the land in this region.

*Parks:* The principal parks of the region which are open to the public include Crane Creek Regional Park and the Sonoma Mountain Trail Corridor. All existing parks are wildland parks. There are plans for public access in the future at the Nunes property and the Matteri property, both of which are held in fee by the Open Space District.

*Habitat protection:* 1672 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are Cook Ranch, a portion of Sonoma Mountain Ranch, Sonoma State's Fairfield Osborn Preserve and Crane Creek Regional Park. Protected properties with habitat value comprise 21% of the land in this region.

*Creeks and ponds:* The region is drained through 10.0 miles of named creeks and 32.4 miles of unnamed creeks and swales. This region includes the headwaters for Copeland and Crane Creeks. There are 16 ponds in the region totaling 16.8 acres in size. The largest of these ponds is 3.8 acres in size, while most cover less than an acre.

#### WRIGHT

This region is the great alluvial plain of the Santa Rosa-Matanzas complex. Spilling out from the pinched jaws of Taylor Mountain to the south and the Mayacama foothills to the north, all of the creek-borne waters behind these front ranges emerge through the Cabeza constriction and onto the Santa Rosa Plain. In contrast to the Cotate Region's fan-like shape, this region's palmate shape suggests to the casual viewer the possibility of a convulsive past. This region is lacking the protection afforded to the adjacent Cabeza, and as a consequence the morning fog lifts earlier providing a slightly sunnier aspect to the region. Mild temperatures, moderate

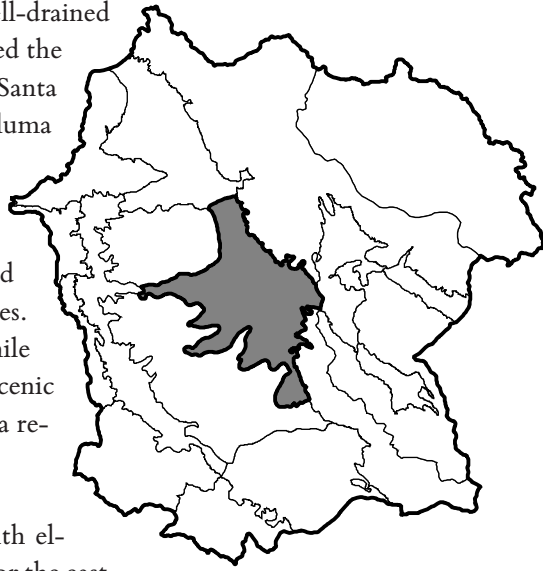
precipitation, level ground, excellent well-drained soils, and plenty of fresh water have provided the perfect setting for the urban population of Santa Rosa. Sitting at the crossroads of the Petaluma to Cloverdale transportation corridor and the Sonoma to Bodega overland route, the city's commercial nexus, once established, has grown steadily ever since, and is projected to continue to increase in the coming decades. Encouraging this economic engine while discouraging the development of nearby scenic treasures and natural resource bases will be a recurring theme for tomorrow's leaders.

*Area:* 12,580 acres (19.66 mi<sup>2</sup>).

*Topography:* This region is very flat, with elevations dropping smoothly in the descent for the east to the west. Only Santa Rosa Creek and its deep cut channel, formed through a century-and-a-half-long history of close urban settlement, shows any visible variation to the plain. All of the other creeks, Coffee, Piner, Paulin, and Poppy to the north, Roseland, Colgan and Todd to the south, presently cross the plain without significant down-cutting. Keeping these creeks free of sediment, safe from flooding, and unharmed by erosion will require continued monitoring and maintenance.

The region's average slope is 0.8%, with one-tenth of its surface area having a slope greater than 4.59%. The region's average elevation is 140' with its lowest point at 63' and its highest point at 361'. With a standard deviation of 32', about 95% of the region's surface area falls between 92' and 200', with the higher elevations being very scarce.

*Neighboring regions:* This region is flanked on the east by three regions: the two mountainous regions, the Foothills and Taylor, and the third flat region, the inner, protected gap of the Cabeza. To the north, San Miguel's boundary is arbitrarily drawn. To the northwest, the plains of Piner are crisply defined where Wright's rich alluvium gives way to Piner's vernal pools. Only the smallest of common boundaries are shared with the Laguna Region where Santa Rosa Creek departs. To the southwest, the muddy, bedrock-underlain, prime vernal pool areas of the Llano are separated from the more arable Wright region along one of the most contorted boundaries of the watershed: three finger-like extensions of the region are found reaching out to Irwin Creek, the Gravenstein-Roseland creek complex, and Colgan Creek.



*Climate:* Annual rainfall for the region averages from 28–37". The driest area is the Roseland district of Santa Rosa. Wetter areas occur throughout the north, and near the foothills of Taylor. The winds of the Petaluma Gap, blocked by Sonoma Mountain and Taylor Ridge, curl northward through this region giving the area predominately south and southeast breezes.

The Bay Area Air Quality Management District, reports "The Cotati Valley [Santa Rosa Plain] lacks a gap to the sea, accommodates a larger population and has a natural barrier at its northern and eastern ends; therefore it has a higher pollution potential than does the Petaluma Valley. During stagnant conditions, polluted air carried up the Cotati Valley by diurnal upvalley flow, and added to by local emissions, could be trapped against the mountains to the north and east." This analysis applies to all four of the populated regions of the Santa Rosa Plain: Cotate, Llano, Wright, and San Miguel.

*Geology:* Only 10% of this region is underlain with bedrock, while the other 90% is underlain by alluvial fan deposits, nearly all of it very recent, extending in four tentacles along Colgan Creek, Roseland-Gravenstein Creeks, Irwin Creek, and Santa Rosa Creek. The non-alluvial areas, which are the exception to the rule, are in three patches. The largest of these areas within the Glen Ellen Formation lies along the axis of Fulton Road extending from below College to above West Steele Lane; it is cut into three pieces by the traversal of Steele, Paulin, and Piner Creeks. A second, small, circular patch of bedrock, about ¼ mile in diameter, is centered over West 3<sup>rd</sup> Street at Brockhurt Drive. A third, even smaller oval shaped patch of bedrock is centered on Santa Rosa Avenue and Kawana Springs Road.

The Rodgers Creek Fault for the most part runs outside this region, making only a short transit from Morton Way in the south, to Beverly Way in the north. The only other geologic fault line in the Wright, is the unnamed, 2700-meter late Quaternary Period fault extending from Petaluma Hill Road at Hunter Lane northwest to a point just shy of Santa Rosa Avenue near Powderhorn Avenue

*Impervious surface:* Approximately 10,512 acres or 84% of the region's surface area is covered with some type of impervious surface. 1118 acres of this are considered to be more than 75% impervious (complete), 4030 acres are considered to be between 50% and 75% impervious (heavy), 2838 acres are considered to be between 25% and 50% impervious (partial), and 2525 acres are considered to be between 1% and 25% impervious (light).

The remaining 2074 acres has not been built on or paved. The estimated canopy cover for the region is 8%.

*Ownership:* The Sonoma County Assessor lists 26,239 distinct parcels for the region, of these 95% are one acre or smaller in size. There are 25,978 parcels five acres or smaller comprising 51% of the land in the Wright region. Several notably large, privately held parcels are located south of Santa Rosa in the dedicated Greenbelt area.

*Parks:* The principal parks of the region which are open to the public include Northwest Community Park, Doyle Park, and the Prince Memorial Greenway. Most existing parks are small urban parks. There are plans for increased public access in the future along creeks in this region as per the Santa Rosa Creek Master Plan.

*Habitat protection:* 398 acres of land have noteworthy habitat value and are publicly owned or have been placed under easements providing some level of habitat protection. Notable among these are Sonoma County Water Agency properties including stretches of Santa Rosa and Piner creeks, Santa Rosa City High School District properties between Highway 101 and Old Redwood Highway along Alba Lane, and the City of Santa Rosa ponds located along West Third Street near Fulton Road. Protected properties with habitat value comprise 3% of the land in this region.

*Creeks and ponds:* The region is drained through 27.3 miles of named creeks and 14.8 miles of unnamed creeks and swales. The largest creek in the region is Santa Rosa Creek. There are 13 ponds in the region totaling 92.9 acres in size. Notable among these are former wastewater holding ponds along the banks of Santa Rosa Creek east of Fulton Road now set aside as bird habitat.

