

CHAPTER FIVE



NATURAL RESOURCES

5. Natural Resources

The Natural Resources, Open Space and Cultural Resources chapters define conservation goals and policies and provide a framework for the conservation and utilization of natural, open space, air quality and cultural resources and protection of the aesthetic qualities of the community.

This Natural Resources section is intended to guide the community in the long-term conservation and preservation of natural resources while protecting private property rights. Policies regarding natural environmental hazards, such as flooding, are addressed in the Health and Safety chapter.

The unique rural setting of the Granite Bay community is the key factor in the quality of life experienced by residents. Granite Bay is endowed with a variety of landforms and environmental resources creating a mosaic of natural features and aesthetic qualities. The community contains gentle oak and grassland foothills, flatter valley areas, valley stream corridors containing riparian habitat, floodplains, and groundwater aquifers. Based on Community Plan Update survey results, the preservation of these natural features represents an important community value.



Figure 5.0.1: Miners Ravine is a significant Granite Bay resource.

As the community continues to grow, it is imperative that growth does not compromise this natural environment. The health of the natural environment is critical to human and economic vitality and the overall well-being of Granite Bay. It provides the fundamental necessities of life—clean air, land and water—and is an essential component of the fabric and character of communities.

Granite Bay residents have repeatedly expressed their desire to maintain the community's rural atmosphere and character. The conservation of natural resources is implied in this desire and has been reinforced through community planning efforts and land use regulations. For these reasons, it is apparent that the foundation of a strong community conservation ethic exists.



Figure 5.0.2: Wetlands and oak woodlands habitat are conservation priorities.

Sustainably managing resources means directing growth to protect and enhance the natural environment, maximize public benefit and contribute to the economy. It means that development is integrated into the

community, while negative impacts to the natural environment, ecological processes and biological diversity are avoided. It also means protecting, enhancing, and where possible, restoring habitat areas.

5.1 NATURAL RESOURCE CONSERVATION

Protection, enhancement and restoration of natural features is important to ecosystem health particularly in an urban/rural environment. Population growth and development continually require the use of both renewable and nonrenewable resources. One role of this portion of the Community Plan is to establish goals and policies that reconcile the conflicting demands on those resources.

Conservation is the planned management, preservation and wise utilization of natural resources. It is also one of the most important strategies for managing Placer County's resources. Resources include, but are not limited to water, energy, land, biodiversity, minerals, natural materials, viewsheds and air. The Conservation section involves both identification of a community's natural resources and adoption of policies for their preservation, development and wise use.

5.2 GOALS

1. Preserve and protect the natural features and resources of the community, which is essential to maintaining the quality of life within the community.
2. Protect the quality of air and water resources consistent with adopted federal, state and local standards.
3. Ensure that land use planning contributes to the protection, improvement, and restoration of water resources and that all new development has a minimum impact on the established natural environment.
4. Pursue and implement sound storm water management practices and sustainable management practices to help ensure protection from flooding and erosion and maintain, and where feasible, improve water quality.
5. Work closely with state and federal agencies, watershed groups and adjacent communities on watershed plans and strategies to provide a comprehensive approach to environmental planning.
6. Encourage public and private stewardship and partnerships directed to restoring, enhancing, and maintaining the natural environment.

5.3 POLICIES

1. The natural resources and features of a site proposed for development shall be one of the planning factors determining the scope and magnitude of development.
2. Particular attention shall be given to protection of the natural regiment in the planning, environmental review, and completion of all subdivisions, land development or land alteration projects.
3. Removal of vegetation shall be minimized and where removal is necessary, replanting for erosion control, maximizing reoxygenation, and retaining the aesthetic qualities of the community.
4. Project landscaping shall emphasize the use of native rather than exotic plants. In areas of high fire risk, however, it may be preferable to introduce carefully chosen exotics with high fire resistance characteristics.

5. Continue to identify and preserve any rare, significant or endangered environmental features and conditions.
6. Encourage the use of ecologically innovative techniques in future development.
7. Encourage the continued use of the Williamson Act to preserve productive agricultural lands.
8. All stream influence areas, including floodplains and riparian vegetation areas shall be retained in their natural condition, while allowing for limited stream crossings for public roads, trails, and utilities.
9. Site-specific surveys shall be required prior to development to delineate wetlands and vernal pools in the Granite Bay Community Plan area. All development proposals involving wetlands shall be coordinated with the California Department of Fish and Game, Corps of Engineers, and U.S. Fish and Wildlife Service. A "no-net-loss" policy requiring preservation of all wetland sites or preservation of priority wetlands and compensation for wetland losses should continue to be implemented by these agencies.
10. The standards of the Placer County Grading Ordinance and this Resources section of the Granite Bay Community Plan shall be implemented for all projects in the Granite Bay area.
11. New construction shall not be permitted within 100 feet of the centerline of permanent streams and 50' of intermittent streams, or within the 100 year floodplain, whichever is greater.
12. In implementing Best Management Practices, the County shall promote consideration of the concepts of low impact development, and sustainable technology, and current standards of the County to address the quantity and quality of storm water run-off released to any watercourse.
13. Protect sensitive habitats such as wetlands, riparian areas, and oak woodlands against any significant disruption or degradation of habitat values. Utilize the following design and use regulations on parcels containing or in close proximity to these resources, excluding existing agricultural operations:
 - Structures shall be placed as far from the habitat as feasible;
 - Delineate development envelopes to specify location of development in minor land divisions and subdivisions;
 - Require easements, deed restrictions, or equivalent measures to protect that portion of a sensitive habitat on a project which is to be undisturbed by a proposed development activity or to protect sensitive habitats on adjacent parcels;
 - Limit removal of native vegetation to the minimum amount necessary for structures, landscaping/gardens, driveways, parking lots, and where applicable, septic systems; and,
 - Prohibit landscaping with invasive or exotic species and encourage the use of characteristic native species.
14. Individual sites and properties can contribute to the health of the environment by incorporating measures such as:
 - Using renewable energy sources such as solar or geothermal energy;
 - Planting additional trees in appropriate locations;
 - Managing storm water runoff using storm water best management practices;
 - Naturalizing landscapes with native, non-invasive species; and,
 - Installing 'green roofs' or light-colored roofs.
15. The County's Tree Preservation Ordinance shall be implemented.

The Natural Resources chapter goals and policies are interconnected, in varying degrees, with other elements of the Community Plan. It is greatly connected to the Land Use and Open Space sections. For example, open space for the preservation of natural resources is directly related to the Conservation chapter while the Land Use and Safety chapters preserve natural resources that may be affected by hazards.

5.4 CONSERVATION PLANNING

Placer County has adopted an ecosystem approach to conservation planning which promotes the principles of sustainable development. The ecosystem approach responds to the dynamic, interrelationship of all elements of a biophysical community, and the long-term management and related monitoring policies that address not only individual, but cumulative impacts to achieve a sustainable, healthy ecosystem.

The Natural Communities Conservation Plan (NCCP) Act of 1991 encourages local governments to plan broad-scale, multi-species conservation in association with watershed and wetlands protection. Placer County is pursuing both a NCCP and a Habitat Conservation Plan (HCP) under the Federal Endangered Species Act for western Placer County including Granite Bay. This plan, termed the Placer County Conservation Plan (PCCP), includes a program designed to ensure the continued conservation of threatened and endangered species in Placer County and to resolve potential conflicts between economic development activities and the conservation and recovery of sensitive species on non-Federal land. The goal of the PCCP is to integrate the land use needs of Placer County's growing human population with the natural systems and species in western Placer County.

The PCCP proposes to establish in perpetuity development boundaries (unlike an urban limit line) and is a method by which many smart growth objectives can be met. It is a tool that will allow Placer County to manage its growth by balancing habitat preservation with economic development and population growth. New development will be directed into appropriate areas and away from non-urban areas. It will assist the County's growth management efforts by clearly identifying which lands are intended for urban use and which are intended to remain agricultural or managed as habitat; promoting environmentally and fiscally sustainable infill development; and strengthening the consistency between the cities' and Placer County's land use plans and development policies.

Now in its draft stage, the County anticipates approval of the Placer County Conservation Plan by signatory agencies by 2014. Through the PCCP and a future updated General Plan that aligns land use, transportation, housing and greenhouse gas reduction planning efforts, there will be better integration of sustainable urban planning and habitat conservation, using the impetus for habitat conservation to promote more efficient urban forms. Adoption of the PCCP and an updated General Plan will have implementation measures that will apply to Granite Bay.

The PCCP is an important part of the County's Placer Legacy Open Space and Agricultural Conservation Program and will help achieve key program goals, such as preserving the diversity of natural plant and animal communities, and preserving agricultural land and open-space. Since its adoption in 2000, twelve properties totaling 8,551 acres have been conserved through acquisition or conservation easement through the Placer Legacy program, none in the Community Plan area however. Placer County continues to work with partners to protect and preserve open space, farmland, and key habitat areas.

It is important to recognize that although sustainable development is an objective of conservation planning, it extends further than just environmental management. Other aspects of sustainable development are addressed within the Recreation, Open Space, Transportation and Community Design sections of this Plan.

Dry Creek Watershed Plan

To ensure that environmental planning decisions are made in accordance with an ecosystem approach, the results of watershed plans form the basis for decision making and policy development. The ecosystem approach to environmental planning has been adopted by a number of jurisdictions and is consistent with state and federal strategies related to planning in a coordinated, integrated and comprehensive manner.

Watershed plans include all of the lands drained by a major river and its tributaries. Watershed plans are prepared to address the protection of a specific aspect of the natural system such as water quality protection, fisheries management, and habitat restoration and protection.

Watershed boundaries often cross municipal boundaries. As such, watershed plans and strategies are usually initiated by a conservation district, water agency, waterfront planning group, or non-profit with participation from the affected counties and cities, state and the public, as appropriate.

In 2003, Placer County completed the Dry Creek Watershed Coordinated Resource Management Plan (CRMP). The geographic scope for the project included the Dry Creek watershed that encompasses most of Granite Bay. The watershed encompasses approximately 101 square miles and includes six tributary watersheds: Antelope Creek, Cirby Creek, Linda Creek, Strap Ravine, Secret Ravine, and Miner's Ravine. Water drains to the Sacramento River through the Natomas East Main Drainage Canal.

The development of a comprehensive resource management plan for the Dry Creek watershed was seen as a necessary element to address the impacts on an urbanizing watershed and to improve the ecological health of the Bay-Delta Region.

The completed watershed analysis addresses riparian habitat, water quality, water flow rates during critical fish passage time periods, fish passage constraints, sedimentation, and an inventory of water intake devices that have the potential to threaten anadromous fish. Field surveys analyzed water quality, fisheries habitat conditions, riparian vegetation conditions (structure and composition), and stream flow characteristics (e.g., seasonal flow regimes, extreme event characteristics, and agricultural water deliveries).

The CRMP includes the following elements:

- 1) Identifies areas of conflict and opportunities for resolution;
- 2) Develops recommendations on program activities to improve the watershed consistent with the project's objectives;
- 3) Develops recommendations on future restoration/enhancement projects;
- 4) Prioritizes the recommended projects and activities and prepare a series of alternatives for implementation; and,
- 5) Provides a final recommended list of activities and restoration/enhancement projects to be funded by future funding sources.

Based on the results of the watershed analysis, Placer County is committed to ensuring the protection, enhancement and restoration of the natural heritage features, functions and linkages to ensure long-term ecosystem health. The analysis of compliance and long-term monitoring information and data will assist the County and other regulatory agencies in reviewing and defining engineering, storm water management and sustainable management practices, and design and landscaping requirements for development to ensure that urban impacts are being appropriately mitigated and in conformance with the goals, objectives and recommendations of the watershed plan.

5.5 SOILS

The predominant soil type is the San Andreas Series. It consists of moderately deep, well-drained soils underlain by weathered granitic bedrock. The soils were formed in upland areas in the Loomis Basin. In a typical profile, the surface layer is grayish brown coarse, sandy loam about 15 inches thick. The subsoil is pale brown coarse, sandy loam underlain by weathered granodiorite at a depth of about 29 inches.

Soils differ based upon landscape position and underlying geology. Most soils in Granite Bay formed from granitic or volcanic parent material, and often include a claypan, hardpan, or other consolidated layer that impedes water permeability. The higher elevations within Granite Bay often have shallow soils and rock outcrops.

Soil is vulnerable to erosion by wind and water, particularly during the construction process. Appropriate measures associated with development must be taken to safeguard public safety, protect property, enhance recreational opportunities and prevent damage to the environment due to erosion. Erosion affects water resources by reducing water quality and the condition of aquatic habitat through siltation. Reduced water quality in rivers, creeks, and Folsom Lake also affects recreational opportunities such as fishing. Erosion can also damage vegetation by exposing roots, which assist in stabilizing soils.

Agricultural Soils. The Community Plan area is a moderately productive region. Most agricultural practices in the area are associated with small farms, or “hobby farms,” livestock raising, orchards, and vegetable gardens. This type of agricultural land use in the Community Plan area reflects soil types that are sufficiently viable and nutrient bearing, but not prime soils. Preservation of agricultural production has been a goal for the Community Plan and has been implemented by establishing agricultural preserves (Williamson Act contracts) in the area. Two farms or ranches covering seven parcels and 212.4 acres are currently enrolled in the Williamson Act.

Table 5.5.1

<i>Williamson Act Contracts</i>		
<i>APN</i>	<i>Status</i>	<i>Acres</i>
<i>035-050-005-000</i>	<i>Active</i>	<i>78.4</i>
<i>035-120-001-000</i>	<i>Active</i>	<i>24.6</i>
<i>035-120-008-000</i>	<i>Active</i>	<i>60.5</i>
<i>050-140-004-000</i>	<i>Active</i>	<i>4.8</i>
<i>050-140-005-000</i>	<i>Active</i>	<i>5.0</i>
<i>050-140-006-000</i>	<i>Active</i>	<i>18.7</i>
<i>050-150-006-000</i>	<i>Active</i>	<i>20.4</i>
Total:		212.4

Source: Placer County GIS Database, 2011

Soil Hazards

Weak and Expansive Soils. Soils that have limitations for structural loading are scattered throughout the Community Plan area, and these limitations can vary substantially over short distances. These limitations can be overcome through soil importation or specially engineered design. Some clay soils tend to expand when wet and contract upon drying, which can cause structural damage. Expansive soils also are scattered throughout the planning area.

Erosive Soils. Erosive soils are also found in the Community Plan area. These soil types are usually silty to sandy soils located on moderate to steep slopes. Careful cultivation, grading, and mulching practices must be implemented to reduce erosion hazards on these soil types.

Soil Types

The following sections provide a description of the soils present in the Granite Bay community. See the soils map at the end of this document for soil type locations.

Caperton Gravelly Coarse Loam. This soil is undulating to hilly, shallow, somewhat excessively drained, and underlain by granitic bedrock. It is formed in residuum on side slopes. Permeability is moderately rapid, surface runoff is medium or rapid, and the erosion hazard is moderate or high. The soil is used mainly for annual range and irrigated pasture. The major limitation for suburban uses is the depth to rock and the slope. When locating roads on this soil type, cuts and fills should be on at least a 2:1 slope because of the soil's erodibility. Community sewage systems should be provided in medium and high-density subdivisions. Septic tank absorption fields may not function properly in this soil because of the slope and depth to rock.

Cometa-Fiddymment Complex. These undulating soils are found on low terraces. Cometa is a deep, well-drained claypan soil that formed in alluvium, mainly from granitic sources. Fiddymment is also well drained and is moderately deep over a hardpan. Permeability is very slow, surface runoff is slow, and erosion hazard is slight for both soils. Most of these soils in the Community Plan area were used for growing winter grain or for rangeland. The major limitations for construction on the Cometa soil are the very slow permeability of the subsoil, the shrink-swell potential of the soil, and the limited ability of the soil to support a load. The major limitations for construction on the Fiddymment soil are the very slow permeability of the subsoil, the moderate depth to hardpan, and the limited ability of the soil to support a load. Dwelling and road construction can be designed to offset the shrink-swell potential and the low bearing strength of the soils. Septic tank absorption fields may not function properly because of the very low permeability of the subsoil, substratum and the hardpan.



Figure 5.5.1: Wetlands and oak woodlands habitat are conservation priorities.

Redding and Corning Gravelly Loams. These soils occupy prominent mounds and side slopes of high terraces. Both soils have a claypan. The permeability is very slow, surface runoff is medium, and the erosion hazard is moderate for these soils. The major limitations for urban use are the very slow permeability of the subsoil and the hardpan under the Redding soil. These limitations restrict the use of septic systems.

5.6 GEOLOGY AND SEISMICITY

The Plan area is situated in the western foothills of the Sierra Nevada, at the eastern edge of the Sacramento Valley. The Sierra Nevada is a large fault block composed of granitic and metamorphic rocks tilted gently from the summit near Donner Lake to the west, where the block dips under the sedimentary and alluvial units of the valley.

Most of the Plan area is underlain by granitic rocks ranging from 125 to 136 million years old. The granitic rocks were intruded in molten form at great depth into layered sedimentary and volcanic rocks, which were folded, faulted, crushed, and uplifted. In the process, these layered rocks were metamorphosed into amphibolite, greenstone, slates, and phyllites. This band of metamorphic rocks trends slightly west of north and has been called the “Mother Lode” because of the gold-rich quartz veins that were intruded along steep faults in the metamorphic rocks.

The highly weathered decomposed granite under the soil, or in some cases at the surface, has very low permeability. Ground water occurs only in small openings along fractures. The amount of ground water within the Plan area’s fracture system is of more limited quantity than in the northern half of the Loomis Basin.

Stream erosion during the episodic uplifts of the Sierra Nevada, combined with varied volcanic activity, has produced the variety of sedimentary rock units present in the plan area. During the last million years, erosion and sedimentation have led to the formation of alluvial deposits.

Weathering has produced the present-day landscape. Rounded hills of decomposed granite, scattered outcrops of more resistant rocks, and steep bluffs supported by the Mehrten Conglomerate or Volcanics are dominant elements of Granite Bay.

Geologic Formations

Alluvial Terrace Deposits. Quaternary alluvial terrace deposits in the Community Plan area consist of older and younger terrace deposits. Younger alluvial terrace deposits are typically adjacent to active streams and consist of unconsolidated sand and gravel mixtures. These deposits are very permeable and exhibit high infiltration rates; the groundwater table often rises through them during the wet winter months to near the ground surface, posing a constraint to development.

Older alluvial terrace deposits are less common than are younger terrace deposits and are often exposed adjacent to the younger deposits. Older terrace deposits are typically semi-consolidated to well-cemented gravel to gravelly sand. These deposits exhibit very low permeability and low percolation rates.

Mehrten Conglomerate. The Mehrten conglomerate is a well-cemented Miocene conglomerate that is primarily exposed on isolated hills or topographic highs throughout the Loomis Basin. Constraints to development on the Mehrten Formation include variable percolation rates, poor soil conditions, and the relative difficulty to excavate the material because of its cobble size and cemented nature.

Granite Bay includes a portion of the Sierra College Ridge, a long ridgeline extending from Rocklin to Roseville along Sierra College Boulevard, that is comprised of Mehrten Formation material which supports a unique type of vernal pool. However, much of the Mehrten vernal pools have been lost in the last 30 years to suburban development.

Metamorphic Rocks. Metamorphic rocks consisting of amphibolite, or “greenstone,” are exposed in the eastern portion of the Community Plan area. These rocks are generally weathered and fractured at the ground surface and are hard and impermeable at greater depths. The amphibolite outcrops may exhibit rock falls or unstable slope conditions during construction and excavation, especially in areas of steep slopes.

Seismicity

The area is considered relatively seismically inactive, but is located between two areas of document tectonic activity. No active faults are known to exist within the Plan area. The Willows fault, located near the middle of Granite Bay, is believed to have been inactive since the beginning of the Pleistocene epoch. There is potential for significant ground shaking as a result of seismicity associated with potentially active, regional earthquake faults, including the Foothills and Melones Fault zones. Earthquakes occurring on more well known California faults, including the San Andreas, Hayward and Calaveras faults would not be expected to result in significant ground shaking in the Plan area.

The Coast Ranges to the west contain numerous active faults that are associated with the northwest-trending San Andreas Fault system, including the Hayward and Calaveras faults. The Coast Ranges-Sierran Block boundary zone, which follows the physiographic boundary between the Coast Ranges and the Great Valley, contains potentially active “blind” thrust faults, such as the Midland Fault. Based on the size of historical events and on the inferred segmentation of the boundary zone, these “blind” thrust faults are capable of producing moderate to large earthquakes. There are active faults located to the east, including the Cleveland Hills and Carson Valley Faults, in addition to older faults (i.e., pre-Holocene in age, or greater than 11,000 years before present) associated with the Foothill Fault System in the Sierra Nevada foothills, such as the Bear Mountain and Melones fault zones. Additionally, the eastern range of the Sierra Nevada is bordered by a series of active faults associated with the Sierra Nevada Frontal Fault System.

Mineral Resources

Mineral deposits are widespread throughout Placer County; known mineral resources in the county include sand, gravel, clay, gold, quartz, decomposed granite, and crushed quarry rock. Clay, stone, gold, and sand and gravel for construction aggregate are currently extracted. No quarries or mining sites remain active in the Plan area.

Topography

Slopes in the Plan area are generally gentle; few areas have more than a 10 percent slope.

5.7 HYDROLOGY

Granite Bay is located in the Dry Creek watershed, within the Sacramento River Basin, which is bounded by the Sierra Nevada to the east, the Coast Ranges to the west, the Cascade Range and Trinity Mountains to the north, and the Delta-Central Sierra area to the south. The Sacramento River is the principal river in the basin. Its major tributaries are the Pit and McCloud Rivers, which join the Sacramento River from the north, and the Feather and American Rivers, which are tributaries from the east.



Figure 5.7.1: Creeks and riparian areas are significant open space resources.

The Dry Creek watershed's topography ranges from relatively flat along Dry Creek in the southern and western portion of the watershed, to gently rolling hills in the mid-reaches of the watershed, to more prominent steeper hills and varied terrain in the upper regions of the watershed. Elevations in Granite Bay range from approximately 800 feet above Mean Sea Level (MSL) near Lake Forest Drive to approximately 180 feet above MSL downstream where Linda Creek crosses into Roseville.

The primary streams in Granite Bay are Miners Ravine, Linda Creek and Strap Ravine. Miners Ravine is a perennial stream, flowing year-round. Linda Creek and Strap Ravine, a tributary to Linda Creek, were noted as intermittent in 1997 though USGS maps characterize Linda Creek as perennial (see Streams and Setbacks Map in back of document). Most flow arises from precipitation; with summertime flow augmented by irrigation and treated water discharges from the Placer County Sewer Maintenance District No. 3's Wastewater Treatment Facility on Miners Ravine and the City of Roseville's Water Treatment Facility on Linda Creek.

The Dry Creek Watershed Comprehensive Resource Management Plan found that the loss of riparian vegetation, stream bank erosion, and sedimentation of the streams have contributed to the decline of water quality in the watershed.

Miners Ravine is a perennial tributary that has been studied and assessed for a number of different purposes; habitat, geomorphology, and flood studies, to name a few. The main channel is approximately 15.2 miles long. It is entrenched within an alluvial valley floor, and serves to drain approximately 20.1 square miles of mixed-use land.

In addition to streams and creeks, Miners Ravine includes other water features within the Plan area such as Oak Lake, Cottonwood



Figure 5.7.2: The Miners Ravine Nature Reserve permanently protects a number of wildlife habitats along Auburn-Folsom Road.

Lake, Pine Lake, Laurel Lake, Mammoth Reservoir, and more than twenty small, unnamed ponds.

The vegetation along Miners Ravine is most often either oak woodland, or riparian with a full suite of native species (except Himalayan blackberry) or the vegetation is degraded due to the practices of adjacent land owners. Where riparian vegetation is removed, it is most often replaced by non-native species such as German ivy (*Senecio mikanioides*), periwinkle (*Vinca major*), pampas grass (*Cortaderia jubata*), Japanese knotweed (*Polygonum cuspidatum*), and scarlet wisteria (*Sesbania punicea*).

Regardless of impacts or degradation, Miners Ravine is still known to support anadromous fish, including fall run Chinook salmon and steelhead. During Department of Water Resources (DWR) surveys in 2002, potential barriers to fish passage were identified. Although there were several types of barriers located, Cottonwood Dam, due to its potential to be a complete barrier to passage, and beaver dams, because of their sheer numbers, are important. Beaver dams like other dams can result in an increase in stream temperature, barriers to passage, sedimentation or conversion of spawning habitat to pool habitat. Upstream of Cottonwood Dam, the best habitat was observed by DWR, although several marginal potential spawning areas are found near the confluence with Secret Ravine.

Sediment is another of the important issues for Miners Ravine as it is for all the tributaries in the Dry Creek watershed. The lower reaches are sediment impacted while the upper reaches of Miners Ravine are not. The channel substrate consists primarily of bedrock material, and the gradient is steep enough to flush eroded sediment downstream. Removal of riparian vegetation has also contributed to bank instability and erosion in many areas.

Linda Creek is approximately 10.8 miles long. The subwatershed drainage area is 12.2 square miles and there are 7.3 miles of intermittent drainageways and 11.2 miles of perennial, first-order streams. Other waterbodies within this subwatershed are Baldwin Reservoir, Swan Lake, George's Lake at the Granite Bay Golf Club, and approximately ten unnamed ponds/lakes. Baldwin Reservoir was recently restored and currently supports 4.7 acres of wetlands and tree plantings.

The lower reaches of Linda Creek fall within the City of Roseville and Placer County. Linda Creek flows from Granite Bay, through a portion of Sacramento County, and then back into Placer County in the City of Roseville. Adjacent land uses are primarily open space and urban in the lower reaches, rural residential and open space in the middle portion, and low-density residential in the upper reaches in Granite Bay.

In the lower reaches of Linda Creek, there are remnant areas of oak woodland and riparian vegetation. In some areas, the buffers are quite large and in others the creek corridor is small. Non-native invasive plant species in the Linda Creek subwatershed include German ivy (*Senecio mikanioides*), Himalayan blackberry (*Rubus discolor*), Japanese knotweed (*Polygonum cuspidatum*), pampas grass (*Cortaderia jubata*), tree of heaven (*Ailanthus altissima*), and water hyacinth (*Eichornia crassipes*). Himalayan blackberry is the dominant non-native invasive species, especially in the rural areas, where fewer of the other species are present. East of Hazel Avenue the native habitats are higher in quality. Above the lake at the Granite Bay Golf Course, the creek becomes much smaller and, in the extreme upstream areas, is more of a "drainage ditch" with many areas that are landscaped and/or modified.

Similar to all of the other creeks in the Dry Creek watershed, areas that may perhaps be suitable for spawning, or reaches historically may have had spawning habitat, have been impacted by sedimentation. Although this is the case, it is possible that Chinook salmon or steelhead migrating up Dry Creek may enter Linda Creek and attempt to spawn.

Strap Ravine is approximately 3.6 miles long and drains an area of approximately 4.8 square miles. There are four unnamed ponds located on the U.S. Geological Survey (USGS) topograph for this subwatershed, and several more that are not.

There have been significant dredge/mining operations within Strap Ravine, as evidenced by the presence of dredge tailings on the USGS topograph. Mining has affected stream channel configuration. Some areas are high in native plant species composition with habitats such as riparian, oak woodland and wetlands being present. Other areas are ruderal in nature and contain landscaping and ornamental species. Notable non-native species include Himalayan blackberry (*Rubus discolor*) and water hyacinth (*Eichornia crassipes*). Although no in-depth studies have taken place, Strap Ravine is not believed to provide habitat for anadromous salmonids.

Table 5.7

<i>Tributary Sub-watersheds in Granite Bay</i>			
	<i>Acres</i>	<i>Sq. miles</i>	Portion of Dry Creek Watershed
<u>Miners Ravine</u>	12,880	20.13	19.9%
<i>Miners Ravine Creek, Upper</i>	<i>6,384</i>	<i>9.98</i>	<i>9.9%</i>
<i>Miners Ravine Creek, Lower</i>	<i>6,496</i>	<i>10.15</i>	<i>10.0%</i>
Linda Creek	7,798	12.18	12.0%
Strap Ravine	3,093	4.83	4.8%

5.8 FLOODPLAINS

Valuable riparian vegetation and the 100-year floodplain are protected from development by existing County regulations, and because of this, they provide natural open space corridors for trails and wildlife and aquatic species habitat. Additionally, mature, intact riparian vegetation provides an aesthetically pleasing environment for residents seeking to relax and recreate in a natural setting.

Flooding occurs when the conveyance capacity of a channel is exceeded. This phenomenon usually occurs from above average runoff caused by precipitation or snowmelt, but may also be the result of manmade causes. Areas within Placer County subject to 100-year (1 percent chance) and 500-year (0.2 percent chance) flooding are generally confined to the areas adjacent to the county’s local rivers and streams. Map Five in the Appendix section of this Plan shows the FEMA designated 100-year floodplain within Granite Bay.

The 100-year floodplain in Granite Bay varies in condition, from intact riparian zones protected from development by regulations, to impacted and encroached upon areas where development has occurred prior to adoption of regulations restricting development in the floodplain.

In upper watersheds, particularly in the northern portion of the Plan area, floodplains are narrow or insignificant. As tributaries converge, flooding becomes a more serious issue. The streams in the northern portion of the Plan area are generally less impacted than in the lower watershed and are more vulnerable to development due to the large lot sizes and potential for subdivision. Additional information on flooding in the Plan area appears in the Health and Safety section.

5.9 GROUNDWATER

The Dry Creek watershed lies above the Sacramento Valley groundwater basin, North American sub-basin (groundwater basin number 5-21.64, Department of Water Resources, 1998). This basin is composed primarily of Continental Rocks and Deposits Pliocene to Holocene, with some deposits of Continental Rocks and Deposits Eocene and River Deposits Holocene. Depth to groundwater is approximately 161 feet (upper watershed) to 13 feet (lower watershed) below ground surface (U.S. Geological Survey, 2001). The aquifer thickness saturated with freshwater is approximately 500 to 1,500 feet according to a U.S. Geological Survey in 1995.

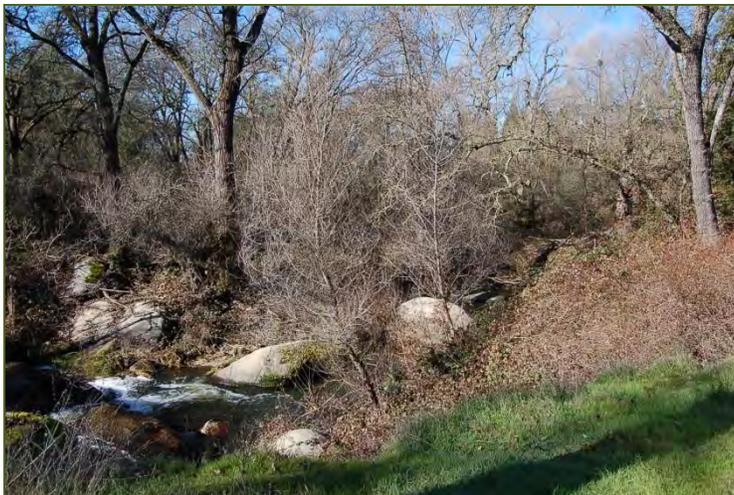


Figure 5.9.1: Miners Ravine near Auburn-Folsom Road.

Under natural (predevelopment) conditions, this aquifer was recharged by seepage from snowmelt- and rainfall-fed streams and channels running from the mountains into the valley area. Most of the recharge occurred at the valley margins and groundwater discharged into surface water bodies at the lower valley altitudes.

From the 1860's to the 1960's, groundwater hydraulic head dropped 40 to 80 feet within the lower confined aquifer in this area. By 1975, however, levels were back to near pre-development conditions due to increased use of surface water resources.

Depths to domestic wells in the area are approximated 50 to 1,750 feet (mean 665). Yields range from 742 to 2,500 gallons per minute (California Groundwater Bulletin 118, 2003) and withdrawals are approximately 1 acre-feet per acre per year (U.S. Geological Survey, 1995). Most of this basin has good water quality; however, localized portions may have marginal water quality due to natural variability in the aquifer (U.S. Geological Survey, 2001).



Figure 5.9.2: Miners Ravine at Sierra College Boulevard.

5.10 WETLANDS

Wetlands are a very important component of the natural resource system with respect to both land and water related ecosystems including water quality and quantity, flood management, habitat for terrestrial and aquatic plants, fish and wildlife, food chain support and social and economic benefits. Under state and federal law, it must be demonstrated that there will be no negative impacts to wetlands features and/or functions from development and/or site alteration of lands.

5.11 STORM WATER MANAGEMENT

Storm water management continues to evolve from a philosophy of providing drainage and protection from flooding, to recognizing and attempting to mitigate the impacts of development on water quality and waterway erosion, to a more current recognition of storm water as a resource and the importance of implementing preventative approaches to storm water management by minimizing runoff through Best Management Practices (BMPs).

To ensure the health of the watersheds and sub-watersheds within Granite Bay and in downstream communities, storm water management is required for all new development areas and infill and redevelopment projects to control both the quality and quantity of storm water runoff. There are significant benefits in implementing effective storm water management techniques such as reducing erosion of watercourses, avoiding downstream flash flooding, reducing siltation and sediment loading, promoting watershed process protection, and ensuring that there is no destruction of aquatic, plant and animal populations.

The County will promote the use of BMPs to achieve a “best fit” of design and technology to promote environmentally sustainable development. To this end and to the extent practicable, the County will encourage the use of naturalized at-source measures such as bioswales to mitigate the effects of storm water quantity and quality impacts on both surface and groundwater resources.

The County shall endeavor to ensure that all construction sites utilize the most up-to-date practices to minimize the introduction of silt and debris into natural watercourses including siltation fences and traps, sediment ponds, and the application of fast growing grass or related seed to earth mounds or bare-earth areas. For more information, see the principles contained in the Community Design section and the Flood Hazards section in the Health and Safety chapter.

5.12 VEGETATION

Local plant communities are typically ruderal annual grasses and forbs in range lands and pastures, lawns and scattered native or non-native trees in parks, golf courses, school yards and other landscaped areas, mixed oak woodlands in upland and riparian areas, and smaller areas of emergent or scrub shrub wetlands, creeks, and open waters.

An example of an important combination of habitat types in Granite Bay would be a mature riparian forest in proximity to open



Figure 5.12.1: Oak woodlands are a significant resource in Granite Bay.

grasslands. These habitat types provide surface water, cover for small mammals and deer, trees for raptors that may nest there, tree hollows for bats and cavity-nesting birds, and foraging opportunities for the hawks and owls that hunt open lands and for egrets and herons that hunt for fish and amphibians. Habitats that are compromised by breaks in connectivity, such as roads, or impaired by poor water quality will inevitably produce fewer numbers and types of flora and fauna.

Wildland fires are a potential threat to individuals and property in Granite Bay. Although the community has full fire service capabilities through local fire departments, the amount of woodland and grassland habitat intermixed with residential land uses has the potential for significant fire events. Continued encroachment into wooded areas will exacerbate the potential for impacts.

For more on woodlands and the urban forest, see the Open Space chapter.

5.13 CLIMATE

Granite Bay lies within the Sacramento Valley Air Basin. The basin is bounded by the North Coast Ranges on the west and the Northern Sierra Nevada Mountains on the east. The Mediterranean climate of the Sacramento Valley has a warm, dry season during April through October; and a wet, mild season from November through March. Mean monthly temperatures range from about 33.3 degrees Fahrenheit (January minimum) to 97.2 degrees Fahrenheit F (July maximum). Annual precipitation is approximately 20 to 25 inches per year, with peak rainfalls occurring in December through February. Prevailing winds are moderate and vary from moist clean breezes from the south to drier winds from the north.

It is important to monitor the potential impacts of global climate change on the Granite Bay watersheds and Folsom Lake. Changing climate conditions, for example, the potential increase in carbon dioxide that may lead to global warming, could significantly change the regional hydrology. Some studies have indicated that doubling of CO₂ could affect temperature change differently in various portions of the state and is likely to occur in the next 50 to 100 years if current trends continue. Climate models estimate that the higher temperatures resulting from doubling of CO₂ may warm the Sierra mountain ranges resulting in reduced snow pack and higher winter surface water flow (more flooding potential), lower spring/summer flow (less snow pack storage), and higher overall precipitation. These effects would greatly impact water storage and conveyance systems, water needs and use, and regional biological resources that have adapted to a different hydrology.

5.14 FISH AND WILDLIFE

The County's General Plan policies recognize that the local fish and wildlife habitat within Placer County is linked to and form part of the larger regional and state natural habitat system. The County recognizes the need for both environmental impact reports and long-term monitoring to ensure that development can protect, maintain, enhance and restore biodiversity to achieve a self-sustaining natural heritage system.

The presence of fish and wildlife habitat within an urban or suburban setting is a



Figure 5.14.1: Miners Ravine provides salmon habitat.

significant component of a healthy, diverse and self-sustaining ecosystem. Wildlife habitat also has secondary recreational or quality-of-life benefits (i.e. nature viewing, bird watching, and fishing).

The flora and fauna found in Granite Bay are largely a reflection of soils, climate and land use. The area has a range of land uses, including residential, commercial, agricultural and recreational. Similarly, the soils range from relatively well-drained soils in agricultural use to fully built-out urban areas with a very high degree of impervious surfaces.

Wildlife tends to locate in those areas where they can find the essentials of survival and reproduction, including foraging nesting and breeding habitats. Fish and other aquatic organisms may be found in those areas that are suitable in terms of water quality, cover, and other factors, and both fish and wildlife require the capacity to move freely between the resources that they utilize and, in some cases, to migrate.

Granite Bay's habitat types provide surface water, cover for small mammals and deer, trees for raptors that may nest there, tree hollows for bats and cavity-nesting birds, and foraging opportunities for the hawks and owls that hunt open lands and for egrets and herons that hunt for fish and amphibians. Habitats that are compromised by breaks in connectivity, such as roads, or impaired by poor water quality will inevitably produce fewer numbers and types of flora and fauna.

Fall run Chinook salmon and steelhead have been observed on Miners Ravine, and Linda Creek. Central Valley Chinook salmon, listed as Endangered under the federal Endangered Species Act, and Central Valley steelhead, a candidate for listing and either threatened or endangered under the federal Endangered Species Act, occur in Linda Creek and Miners Ravine.

A 1993 habitat evaluation of Miners Ravine found good physical habitat, but low late-summer flow levels. Past and present development practices from Granite Bay to Roseville are affecting the generally moderate instream habitat. Substrate is generally sand-dominated, with significant sand deposits in pools and along point bars. Beaver dams were noted as significant on upper Miners Ravine.

Miners Ravine supports a relatively healthy riparian corridor. Riparian resources range from complex riparian forest to urban landscaping. In a few reaches, the stream has been channelized with homes lining both banks. In addition, many off-stream landscaping ponds occur along the upper reaches.

Habitat for anadromous salmonids is marginal however. Pools and riffles are present; though beaver dams create most of the pool habitat. Low flow conditions during summer months are a constraint to instream rearing of salmonids. Barriers to upstream fish migration are present, including rubble and debris dams and beaver dams. The most important barrier to fish migration is the Cottonwood Dam at the Hidden Valley subdivision. This earthen dam has no fish passage facilities, and blocks upstream migration of Chinook salmon and steelhead to the highest quality spawning gravels and juvenile salmonid rearing habitat in Miners Ravine. The Moss Lane weir is also at least a partial block to upstream migrating salmon and steelhead, and downstream dewatering has occurred during stream storage behind the weir.

Elderberry shrubs have been observed in riparian/oak vegetation providing potential habitat for valley elderberry longhorn beetle. Some dense riparian areas are suitable for yellow-breasted-chat, yellow warbler, and Modesto song sparrow. Many dammed ponds are suitable for western pond turtle. Baldwin Reservoir is a large pond/marsh complex that supports nesting Canada Geese and other waterfowl. Cooper's hawk has been observed in the Sierra College Boulevard area. Tricolored blackbird and Red-shouldered hawk have been observed in the Linda Creek watershed.

5.15 AIR QUALITY

Air quality is an important resource in the Granite Bay area. Clean air is not only healthier for residents, it also has economic benefits by making the Plan area a more attractive place to live.

As a result of prevailing winds coming generally from south to southwest, air quality in the area is heavily influenced by mobile and stationary sources of air pollution located upwind in the Sacramento Metropolitan Area. The Plan area is a non-attainment area for the Federal ozone standard and did not attain the standard by the December 31, 1987 deadline mandated by the Clean Air Act.

Poor air quality in the Sacramento region is attributed to emissions from human activities and natural sources, as well as geography, local weather and climate. Federal, state and regional agencies, such as the Placer County Air Pollution Control District (PCAPCD), regulate air pollutants and contaminants that harm human health.



Figure 5.15.1: Traffic on Auburn-Folsom Road near the County line.

Regulations can include local rules, ordinances and policies, ambient monitoring, developing permitting programs, enforcement activities, and establishing economic incentives to reduce air pollution. One of the most effective ways of improving air quality in the plan area is by applying the most recent standards and trends in air quality improvement to land use projects. By consistently applying these standards, as well as the following goals and policies to projects proposed within the plan area, the County will be making its own contribution towards improving air quality within the Granite Bay Community Plan area.

5.15.1 Goals and Policies

The regulations found in this section apply to new development in Granite Bay. Good land use planning should be employed to insure that air quality in the community does not deteriorate, and whenever practical be improved. Appropriate air quality measures may be required as a condition of approval for discretionary projects.

GOALS

1. Reduce the impacts of greenhouse gases and climate change through the review of land use projects proposed in the Plan area.
2. Integrate land use, transportation, and air quality planning to make the most efficient use of public resources and to create a healthier and more livable environment for the Granite Bay area.
3. Reduce emission impacts to “sensitive receptors” (children, the elderly, persons afflicted with health issues) living in the Granite Bay Community Plan area.

POLICIES

1. Ensure that project air quality impacts are quantified using analysis methods and significance thresholds as recommended by the PCAPCD.

2. Ensure that projects which may have potential air quality impacts mitigate any of its anticipated emissions which exceed allowable emissions as established by the PCAPCD.
3. Ensure all air quality mitigation measures are feasible, implementable, and effective for individual projects and on a community-wide basis.
4. Encourage innovative mitigation measures and approaches to reduce air quality impacts by coordinating with the PCAPCD, project applicants, and other interested parties.
5. Work with the PCAPCD to reduce particulate emissions from project construction, grading, excavation, demolition and other sources.
6. Encourage the use of pollution control measures such as landscaping, vegetation and other materials, which trap particulate matter or control pollution.

State Air Quality Regulations

California's Global Warming Solutions Act of 2006 set 2020 greenhouse gas emissions reduction into law. It directed the California Air Resources Board (ARB) to begin developing discrete early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reduce greenhouse gas emissions in the state to 1990 levels by 2020.

ARB is currently determining how the AB 32 goals will be reached. AB 32 marks a significant change in California's energy policies. The reduction measures to meet the 2020 target are to be adopted in 2011 are expected to have wide reaching impacts.

A variety of strategies, including sector-specific regulations, market mechanisms, voluntary measures, fees, incentives and other policies and programs are likely.

On the local level, PCAPCD requires air pollution sources to comply with applicable district rules and control measures. Projects will be conditioned to mitigate air quality emission impacts that exceed district-established standards. New state and federal regulations in coming years will require additional implementation measures to further protect and enhance the environment, promote energy conservation, improve air quality, and promote consistency between transportation improvements and state and local planned growth and economic development patterns. The Community Plan goals, policies and implementation mechanisms will likely evolve over time to reflect new regulatory requirements.



Figure 5.15.1.1: Programs such as Park & Ride lots help reduce vehicle miles travelled which benefits air quality. This lot is on Taylor Road in Roseville.