

6.0 BIOLOGICAL RESOURCES

The following discussion is based on field surveys, literature review and database queries conducted by TRA. Field surveys were conducted in August, October, and November of 2003, March of 2004, and February, May and June of 2006. The field surveys assessed the habitats in the study area, sensitive species occurrence in the proposed Boundary Expansion Area, and the status of reclamation in the Limestone and Shale Quarries. In addition to field surveys, TRA staff consulted the California Natural Diversity Database (CNDDDB) and CDFG, and reviewed monitoring reports completed under the Bonny Doon Quarries Habitat Conservation Plan (HCP) and the 1996 Reclamation Plan.

6.1 ENVIRONMENTAL SETTING

6.1.1 Regional Setting

Santa Cruz County is located on the central California coast. The northern rural portion of the county, where the project is located, includes the Santa Cruz Mountains, a portion of the Central Coast Range (Figure 1). The Santa Cruz Mountains are typified by a moderate Mediterranean climate characterized by high rainfall (40 to 50 inches per year) in the winter months. Vegetation in the region is primarily composed of mixed evergreen forest communities dominated by coast redwood (*Sequoia sempervirens*), Douglas-fir (*Pseudotsuga menziesii*), Pacific madrone (*Arbutus menziesii*) and tanoak (*Lithocarpus densiflorus*). Evergreen forest, coastal scrub and maritime chaparral communities typify the western slopes of the Santa Cruz Mountains, above the coastal terraces and valleys along the Highway 1 corridor. Residential development is sparse.

6.1.2 Biological Study Area

The biological study area includes the Bonny Doon Shale and Limestone Quarries located within Township 10 South, Range 3 West, Sections 25, 26, 27, 35 and 36 of the Davenport 7.5-minute U.S.G.S. Quadrangle, as well as part of the surrounding area. Elevations range from approximately 400 to 1,200 feet above mean sea level (Figure 32, Biological Study Area). The Limestone Quarry property is 272 acres in size. The Shale Quarry property is 183 acres in size. The proposed project is a 17.1 acre expansion of the Limestone Quarry on its eastern boundary.

The Limestone Quarry is in the upper watershed of the eastern and main (or middle) branches of Liddell Creek. The Shale Quarry is in the watersheds of San Vicente Creek and the western branch of Liddell Creek. Several springs are located in these upper watershed locations, including the Liddell Spring and the Plant Spring that are used for water supply. CEMEX diverts water from Plant Spring located at the eastern side of the Limestone Quarry. The City of Santa Cruz diverts water from Liddell Spring at the southern boundary of the Limestone Quarry.

CEMEX routes storm water runoff through settlement basins prior to releasing it to the creek system in order to reduce the sediment load offsite. At the Limestone Quarry there are four settlement basins, numbered 1, 2X, 3, and 4. At the Shale Quarry there are three settlement basins, numbered 5, 6 and 7. Vegetation communities that occur within and adjacent to these

basins include willow riparian forest, riparian/wetlands (at the outlet of Settlement Basin 2X), freshwater marsh (within Settlement Basins 2X and 3), and mixed riparian forest (around Settlement Basin 7). Settlement Basins 2X, 3, 4, 5, 6, and 7 are periodically dredged to maintain capacity. California red-legged frog (*Rana aurora draytonii*; CRLF); federal threatened has been found to occur in Settlement Basins 1, 2X, 3 and 4. It has been documented as breeding consistently in Settlement Basin 1 and periodically in Settlement Basin 3 (Bulger, December 2005).

Within the quarries themselves the vegetation communities reflect quarrying operations and activities. The substrate in quarried areas is nutrient-limiting and revegetation occurs slowly. Areas of sheer rock typically remain unvegetated. Talus and rock piles are suitable for some species, but are usually sparsely vegetated if at all. Disposal Areas where overburden has been placed support weedy, predominantly non-native vegetation except where reclamation has occurred. In areas not actively quarried, rock faces resulting from quarrying may be used by wildlife species such as violet-green swallow (*Tachycineta thalassina*), cliff swallow (*Petrochelidon pyrrhonota*), and bats. The rock faces at the Limestone Quarry are an unusual and valuable resource for wildlife in this regard. Talus and rock piles provide cover and denning sites for reptiles and rodents. Spoil and disposal material sites support ruderal vegetation, which provides low value foraging habitat to wildlife.

Reclaimed and revegetated areas at the quarries are dominated by hydroseeded native grasslands, developing coastal scrub communities, riparian forests, and young redwood forest (see Figures 33, Limestone Quarry Existing Vegetation (2003) and Figure 34, Shale Quarry Existing Vegetation (2003)). These areas support less floristic diversity and structural complexity than adjacent previously undisturbed habitats, as expected. The original reclamation plan was approved in 1988. Areas that were reclaimed shortly thereafter are regaining both species and structural diversity more closely resembling intact native vegetation communities. In grasslands, these communities include valley needlegrass, and mixed grassland. In areas planted to scrub, these communities include developing northern coastal scrub. In areas planted or volunteering as forest, the vegetation communities include immature north coast alluvial redwood forest, mixed evergreen forest and willow riparian forest.

Removal of invasive exotic plant species, including French broom (*Genista monspessulana*), Monterey pine (*Pinus radiata*), Monterey cypress (*Cupressus macrocarpa*) and pampas grass (*Cortaderia selloana*), has been effective and is on-going. Plantings in wetland/drainage areas have led to successful restoration of willow and riparian forests in areas that previously had substantial exotic plant infestations.

The newer reclaimed areas provide lower quality habitat for wildlife species than adjacent undisturbed habitats, but the older reclaimed areas have regained both species and structural diversity and are of similar quality to that of surrounding habitats.

Additional discussion of the reclamation plan is included in Section 2.5 and in Sections 6.1.4 and 6.3.3 of this chapter. Figures 11 and 12 show the approved revegetation plan.

6.1.3 Proposed Boundary Expansion Area

6.1.3.1 Vegetation Communities

Vegetative communities are assemblages of plant species that occur together in the same area, which are defined by species composition and relative abundance. The vegetation communities found in the Boundary Expansion Area are described using the CNDDDB/Holland type in order to maintain consistency with the 1996 Bonny Doon Quarries EIR (County of Santa Cruz 1996a) and the County's GP/LCP. A list of all vascular plants identified during field surveys in the Boundary Expansion Area is included in Appendix C, Table 1.

The proposed Boundary Expansion Area contains four natural upland communities (Figure 35, Vegetation Communities and SFDW Houses): coast live oak forest; northern coastal scrub; mixed evergreen forest; and upland redwood forest. These and the wildlife associated with them are described below.

Habitat values of vegetation communities are based on the availability of surface water, wildlife food plants and prey associations. While some wildlife species are restricted to specific habitats, many species are expected to occur among the various communities throughout the biological study area. Valuable wildlife resources identified within the proposed Boundary Expansion Area include the presence of seasonal surface water, an abundance of snags and cavity-bearing trees, significant structural diversity, the presence of large woody debris, wildlife corridors connecting to communities outside the quarry property and a diversity of wildlife food plants. Numerous wildlife species were observed in the Boundary Expansion Area during field surveys, including a mountain lion (*Felis concolor*). A list of all wildlife species observed and expected in the Boundary Expansion Area is included in Appendix C, Table 2.

Coast Live Oak Forest

This community is dominated by coast live oak (*Quercus agrifolia*) and occurs on 0.9 acre of west-facing slope at the edge of the current mining perimeter. Associated tree species include knobcone pine (*Pinus attenuata*) and ponderosa pine (*Pinus ponderosa*). Canopy cover is relatively high in these stands. The understory is relatively open and associated shrubs include hazelnut (*Corylus cornuta*) and poison oak (*Toxicodendron diversilobum*). Herbaceous species include sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), hedge nettle (*Stachys ajugoides*) and miner's lettuce (*Claytonia perfoliata*). The County Sensitive Habitat Protection Ordinance includes oak woodlands in its list of locally unique biotic species/communities.

Many wildlife species are known from these habitats, including songbirds, raccoon and grey squirrel. Acorn-producing forests such as this are an important ecological wildlife component of the California landscape. Acorn crops provide forage for numerous species while the foliage attracts herbivores and insects, species that in turn attract larger predators and birds. These communities support a higher abundance and diversity of cavity-nesting/denning wildlife species due to the presence of mature and senescent oaks and snags. Downed woody debris can provide a suitable micro-climate for amphibian species such as California slender salamander (*Batrachoseps attenuata*), rough-skinned newt (*Taricha granulosa*), and ensatina (*Ensatina eschscholtzi*). Arboreal salamanders (*Aneides lugubris*) occur primarily in these live oak woodland communities. Brush-pile houses created by the SFDW, a California Species of

Concern, were observed in this habitat. This community also provides nesting and forage habitat for white-tailed kite (*Elanus leucurus*; federal Species of Concern, state fully protected), but no evidence of kite use was detected during site surveys. It provides forage and roosting habitat for bat species, including possibly forage habitat for Townsend's big-eared bat (*Coryrhinus townsendii*; federal and state species of concern). Species of concern are discussed in Section 6.1.3.

Mixed Evergreen Forest

Mixed evergreen communities dominated by a canopy of Douglas-fir (*Pseudotsuga menziesii*) and tanoak (*Lithocarpus densiflorus*) are present on 2.3 acres of slopes and ridges within the proposed Boundary Expansion Area. A significant component of these stands is Pacific madrone (*Arbutus menziesii*). Other associated tree species include California bay (*Umbellularia californica*), canyon live oak (*Quercus chrysolepis*) and California wax myrtle (*Myrica californica*). The shrub layer consists of open to dense patches of scrub in openings in the canopy. These are dominated by deer brush (*Ceanothus integerrimus*), blue blossom (*Ceanothus thyrsiflorus*), toyon (*Heteromeles arbutifolia*), poison oak and thimbleberry (*Rubus parviflorus*). Herb layers are diverse and include species such as hawkweed (*Hieracium albiflorum*), slender tarweed (*Madia elegans*), Pacific sanicle (*Sanicula crassicaulis*) and yerba buena (*Satureja douglasii*).

Mixed evergreen forest supports a diverse assemblage of wildlife species, including large mammals such as the bobcat, mountain lion and mule deer (*Odocoileus virginianus*), as well numerous bird species such as dark-eyed junco (*Junco hyemalis*), Pacific-slope flycatcher (*Empidonax difficilis*), western screech-owl (*Otus kennicottii*), great horned owl (*Bubo virginianus*), northern flicker (*Colaptes auratus*), acorn woodpecker (*Melanerpes formicivorus*), orange-crowned warbler (*Vermivora celata*), yellow-rumped warbler (*Dendroica coronata*), Anna's hummingbird (*Calypte anna*), California towhee (*Pipilo crissalis*), ruby-crowned kinglet (*Regulus calendula*), California quail (*Callipepla californica*) and black phoebe (*Sayornis nigricans*). Reptiles expected in this community include southern alligator lizard (*Gerrhonotus multicarinatus*) and common kingsnake (*Lampropeltis getulus*). Brush-pile houses created by the SFDW were observed in this habitat. This plant community also provides forage and roosting habitat for bat species, including possibly forage habitat for Townsend's big-eared bat (federal and state species of concern).

Northern Coastal Scrub

Pockets of coastal scrub dominated by coyote brush (*Baccharis pilularis*) and poison-oak are present in the western portion of the Boundary Expansion Area, and cover 2.5 acres. It occurs on open west-facing slopes between the redwood forest and coast live oak forest communities in the Boundary Expansion Area. Associated shrub species include California coffeeberry (*Rhamnus californica*), blue blossom, and cascara (*Rhamnus purshiana*). These shrub communities have heavy to moderate canopy cover. Herb layers are typically light and associated species include bracken fern, and annual grasses such as wild oats (*Avena* sp.). Coastal scrub is listed as a "locally unique biotic community" in the County's Sensitive Habitat Protection Ordinance.

A wide variety of reptiles, birds and mammals are expected to occur in this dense vegetation cover. Reptiles such as western fence lizard (*Sceloporus occidentalis*), western skink

(*Eumeces skiltonianus*) and western rattlesnake (*Crotalus viridis*) can make use of these shrub-dominated communities for cover and to forage for rodents and invertebrates. Birds typical of this community include California quail, California towhee, California thrasher (*Toxostoma redivivum*) and white-crowned sparrow (*Zonotrichia leucophrys*). Birds use this community to nest and to forage for seeds, insects and other invertebrates. Small mammals that are associated with this community include brush rabbit (*Sylvilagus bachmani*), California pocket mouse (*Perognathus californicus*), California mouse (*Peromyscus californicus*) and brush mouse (*Peromyscus boylei*). Larger predators such as mountain lion and bobcat (*Lynx rufus*) are expected to forage in this community. Brush pile houses of the SFDW were found in the Boundary Expansion Area in this habitat type. Forage is available for bat species, including Townsend's big-eared bat.

Upland Redwood Forest

Upland redwood forest is dominant in the Boundary Expansion Area, and covers 11.4 acres. It is a relatively mature second growth stand, with a few very large trees mixed in. Old growth stumps and fire scars show the historical management by burning after clearcutting in the Santa Cruz Mountains. These redwoods are most likely from 90 to 125 years old with a few older specimens. These stands occur on the west facing slopes above the Limestone Quarry pit and down the slopes of the two largest ravines (where dirt roads occur) within the Boundary Expansion Area. The understory is composed of shrub species such as huckleberry (*Vaccinium ovatum*), red elderberry (*Sambucus racemosa*), and California coffeeberry. The shrub layer is open to moderately dense in places. The herb layers are dominated by sword fern and redwood sorrel (*Oxalis oregana*), but contain a complex association including orchids, such as streamside orchid (*Epipactis gigantea*), and rein orchid (*Piperia transversa*), lilies such as fairy bells (*Disporum smithii*), red clintonia (*Clintonia andrewsiana*), false Solomon's seal (*Smilicina racemosa*), and wakerobin (*Trillium chloropetalum*) and grasses such as vanilla grass (*Heirochloe occidentalis*) and oniongrass (*Melica imperfecta*).

Wildlife found in these communities includes large mammals such as the bobcat, mountain lion, mule deer (*Odocoileus virginianus*), as well numerous bird species such as northern flicker, Anna's hummingbird, California towhee, ruby-crowned kinglet, California quail and black phoebe. The upper canopy of the large trees in these stands provides abundant nesting opportunities for woodpeckers, raptors and resident songbirds. SFDW brush pile houses occur in the upland redwood forest in the Boundary Expansion Area.

6.1.3.2 Special Status Plant and Wildlife Species

Special-status plant and wildlife species are those that are recognized as rare and vulnerable to habitat loss or population decline. Some special-status species receive specific protection as defined in federal or state endangered species legislation. Others have been designated as "sensitive" based on the expertise of state resource agencies or organizations, or by policies adopted by local agencies such as counties, cities, and special districts, to meet local conservation objectives (see Section 6.2 Regulatory Setting). These species are referred to collectively as "special-status species" in this EIR.

A list of special-status species reported to occur within the biological study area was compiled using data in the CNDDDB, consultation with the CDFG and USFWS, and a review of the CNPS sixth inventory of rare plants (CDFG, 2002; CNPS, 2001, USFWS, 2002). Appendix

C, Table 3, includes an assessment of each species that are known to occur, or have the potential to occur within the biological study area (see Section 6.1.2). In addition to the state and federal special-status species and communities identified in Appendix C, Table 3, the County of Santa Cruz has designated northern coastal scrub and coast live oak forest as locally unique biotic communities (see Chapter 16.32 of the County Sensitive Habitat Protection Ordinance).

Although the biological study area contains a number of special-status species, many of them are highly endemic and the proposed Boundary Expansion Area does not contain suitable habitat to support them. Several of the plant and animal species were identified as having a low potential to occur in the Boundary Expansion Area based on available habitat. While the presence of these species could not be unconditionally ruled out, it is highly unlikely that they are present within the Boundary Expansion Area. These species include marbled murrelet, Cooper's hawk, American peregrine falcon, white-tailed kite, Townsend's big-eared bat, American badger, robust spineflower, Santa Cruz wallflower, Santa Cruz tarplant, Bonny Doon Manzanita, Kellogg's horkelia, Monterey pine, and Schreiber's manzanita. None of these species were observed at the site during several surveys.

Several sensitive species and sensitive vegetation communities are either known to occur in or near the biological study area, or have a medium to high potential to occur in or near the biological study area based on available habitat (see Appendix C, Table 3). The special-status species and vegetation communities that could be affected by the Boundary Expansion Area project, are described below except for coast live oak forest and northern coastal scrub, which are described in Section 6.1.3.1 above.

California Red-legged Frog (CRLF)

The CRLF is federally listed as threatened and is defined by the state as a CSC. This species occurs from Shasta County south to the Mexican border. CRLFs require permanent or nearly permanent bodies of water for persistence. They are known to occur within grassland, riparian woodland, oak woodland, and coniferous forests, but require quiet pools, slow-moving streams, and marshes with heavily vegetated shores for reproduction.

The CRLF occasionally traverses a mile (1.6 kilometers; a mile is 5,280 feet) or more through upland habitats during rainy periods when seeking out new breeding locations. During warmer periods, CRLF can be found in rodent burrows in upland habitats. For this reason, CRLF requires breeding habitats (ponds/ streams) along with adjacent upland dispersal corridors between breeding habitats for long-term persistence. In addition, the juvenile frogs move away from breeding habitat and harbor in creeks or springs until reaching breeding age. These non-breeding water sources are important for species persistence since juvenile frogs are preyed upon by adult frogs at breeding ponds.

The Bonny Doon Quarries are the subject of the Bonny Doon Quarries Settlement Pond HCP (Toyon Environmental Consultants, 1999) for CRLF. This species has been monitored at the site since 1997 under the HCP. It is also known to occur in several locations within two miles of the study area, including in Liddell Creek downstream of the project and in San Vicente Creek.

In section 1.2 of the Bonny Doon Quarries Settlement Pond HCP, it states that "Quarry operations involve the removal and processing of ore, disposal of waste material, sediment pond

operation and maintenance, and reclamation.” The HCP includes a description of the daily activities of the Limestone Quarry in the context of background information pertinent to the activities covered by the federal Section 10(A)1(b) permit. The background information includes daily mining activities for both the Limestone and Shale quarries. An incidental take permit was required only for activities associated with the settlement ponds, and not for other quarry activities. In addition, according to the 2006 Final Rule on Critical habitat for the CRLF, the USFWS indicates that “the Bonny Doon HCP contains measures to minimize and mitigate impacts to the California red-legged frog and its habitat from the operations, maintenance, and possible reclamation activities and to further conservation of the subspecies.”

Under the HCP, Settlement Basin 1 is purposely maintained to foster CRLF breeding, and has provided breeding habitat since 1997 (Bulger, 2005). Although the breeding was not successful the first year, it has been successful every year since. Evidence of breeding (eggs or larvae) has also been observed in Settlement Basin 3. Both Settlement Basins 1 and 3 also support adult and juvenile frogs. Adult frogs have occasionally been found in Settlement Basin 2X, and both adults and juveniles (metamorphs) have occasionally been found in Settlement Basin 4. The Boundary Expansion Area is approximately 2,100 feet from Settlement Basin 1 (see Figure 3), and is separated by the active quarry pit. It is 3,600 feet from Settlement Basin 2, about 4,100 feet from Settlement Basin 2X, 2,400 feet from Settlement Basin 3, and 2,800 feet from Settlement Basin 4.

On the USGS Davenport quadrangle (1997), ponds are shown at the headwaters of the East Branch of Liddell Creek, about 1,000 feet south of the quarry property. There are ponds to the north, near Mill Creek that are about 3,000 feet away, and Laguna Creek is about 4,000 feet to the east. It is important to identify ponds in the vicinity, as these may be destinations for dispersing frogs. The CNDDDB (May 2007) does not report any records of CRLF use of these ponds.

The Boundary Expansion Area does not contain breeding or harbor habitat for CRLF, and is separated from Settlement Basins 1, 2 and 2X by the quarry pit, which poses a significant barrier to successful migration toward the Boundary Expansion Area. Although the Boundary Expansion Area has seasonal water, it would not provide harbor habitat. Permanent water sources are needed for harbor.

San Francisco Dusky-footed Woodrat (SFDW)

The SFDW is designated as a CSC by CDFG. The SFDW is one of eleven subspecies of the dusky-footed woodrat that live throughout California and the arid west. The range of the SFDW includes the coastal belt of San Francisco as far north as the Golden Gate, as far east as Walnut Creek in Contra Costa County and Niles Canyon in Alameda County, and south at least until the campus of UC Santa Cruz (Hooper 1944). Although the dusky-footed woodrat is generally considered common throughout its range, their complex social structure makes them sensitive to disturbance (Santa Cruz Mountains Bioregional Council, 2004).

The SFDW, a nocturnal mammal, occurs in a variety of brushy and wooded areas that provide cover from aerial and ground predators. Suitable SFDW habitat within the Santa Cruz Mountains includes forests that contain Douglas fir, manzanita, tanoak, coast redwood, and willow species (Bankie, 2005). They are typically not found within open habitats such as grassland, but will traverse through such habitat for mating or range expansion even at the

expense of temporary vulnerability to predators. Kelly (1990) reports a male SFDW traveling 30 meters (100 feet) across a meadow with little cover to reach estrous females for mating.

The SFDW eats primarily woody plants, including leaves, flowers, nuts and berries. Specific food sources used throughout the Santa Cruz Mountains include coast live oak, coffeeberry, blackberry, gooseberry, poison oak, and honeysuckle. It is an opportunistic feeder, and has been observed to use non-native species as a primary food source, although these species are in the same genus as native plants known to be used by SFDW (T. Peterson, TRA, personal observation, 2007). While the main habitat for this species is coastal scrub and oak woodland, in the Boundary Expansion Area SFDW are also found to occur in redwood forest. The redwood forest includes huckleberry, red elderberry, and coffeeberry, which may provide food sources to SFDW there.

The SFDW builds stick structures for nesting that average five feet long and four feet in height. In the literature these structures are known as houses. SFDWs are typically found living in colonies of 3 to 25 houses. These elaborate dwellings help protect the SFDW from seasonal temperature extremes and predators. Various chambers can be found within the houses, each serving a different purpose for its resident SFDW including food storage, nesting, and latrine. Other wildlife such as amphibians, reptiles and invertebrates are commensal users of active SFDW houses. It is common for one SFDW to use several houses. However, some female SFDWs will occupy the same house for their entire lifespan, at which time one of her female offspring take over the house. Therefore, some SFDW houses are actively used for as long as 30 years. (SCMBC, 2004)

Orientation and communication systems among woodrats are complex. They use visual (displays), olfactory (scent-marking), and auditory (tail-rattling) cues that play an important role in social organization (Kelly 1990). Male and female woodrats do not share nests; however, a female will share the nest with her litter for several months. A male woodrat territory typically overlaps 1 to 5 female woodrat territories but no other male territories. However, female territories will overlap with each other. Territory size varies greatly but male territories are typically larger than female territories. Male territories range from 0.3 to 0.6 acres and female territories range from 0.1 to 0.5 acre.

Female woodrats generally have one to two litters per year between February and September. Typical clutch size is two but can be as high as four. The gestation period is 33 days. Neonates are born hairless except for the presence of vibrissae (whiskers) and begin to walk before their eyes open. At 21 days old the young are weaned and eating adult food (Carraway, 1991).

During the months of May and June 2006, thorough field studies were conducted to assess suitable SFDW habitats and house abundance in the mining Boundary Expansion Area. Vegetative communities were mapped. Habitats in all areas surrounding the mining Boundary Expansion Area were also assessed although not as completely. Attempts were made to GPS actual SFDW house locations, however it proved very difficult to acquire satellite reception under the closed canopy of the redwood forest. Therefore, approximate locations were marked by hand on an aerial photo. Houses were searched for any indicators of use such as the presence of fresh scat or green vegetation.

A total of 53 SFDW houses were detected in the Boundary Expansion Area. Of the 53 houses, 40 were determined to be active, 10 inactive, and the status of 3 could not be determined. Houses were found in 21 clumps with one to five nests per clump (see Figure 35). The majority of nests were located within the redwood forest and northern coastal scrub. SFDW houses were not found in areas where the canopy cover was so complete that shade prohibited the growth of any understory. Houses are more abundant in areas with a balance of overstory and shrub layer. The presence of these vegetative strata provide SFDW not only good foraging habitat but also concealment from predators. During the June 2006 field visit, one adult SFDW was observed foraging near a SFDW house within the coast live oak forest.

Given the fact that SFDW are known to use multiple houses, it is difficult to draw any conclusions on the number of SFDW present within the Boundary Expansion Area without physically trapping individuals. However, there was suitable habitat present in the Boundary Expansion Area that did not contain SFDW houses, thus indicating that either the population here has possibly not reached its carrying capacity, or the preferred scrub and oak woodland habitat is at capacity and the population is now using the redwood forest habitat, which may have a lower carrying capacity due to canopy cover that inhibits the growth of understory species that are used as a food source and for house building materials. Predators of SFDW within the study area include Great horned owl, barn owl, red-tailed hawk, coyote, and bobcat and these species could be keeping the SFDW population below the carrying capacity.

Habitat for SFDW occurs throughout the scrub and woodland communities in the biological study area, and houses were also observed in areas adjacent to Disposal Area B when this area was under study as a possible SFDW mitigation site.

Central Coast Steelhead

See Steelhead (central coast ESU) and North Central Coast California Roach/ Stickleback/ Steelhead Stream discussion in Section 6.1.3.3.

6.1.3.3 Sensitive Habitats

Coho Salmon and the North Central Coast Short Run Coho Stream Habitat

Coho salmon (Central California Evolutionary Significant Unit is federal endangered) are known to spawn in the lower portions of San Vicente Creek, below the Shale Quarry. The species is not known to occur in Liddell Creek, however, Liddell Creek is designated as Critical Habitat for this species. The proposed mining expansion of the Limestone Quarry would not occur in the San Vicente Creek watershed and would not impact habitat values or water quality in San Vicente Creek. As a result, it is unlikely that the proposed project would directly impact the coho salmon, however it could affect critical habitat for coho. Project effects on the water quality and quantity of Liddell Creek are described in Section 5.0 Hydrology, and the discussion of biological impacts in Section 6.3.

Steelhead (central coast ESU) and North Central Coast California Roach/ Stickleback/ Steelhead Stream

National Oceanic and Atmospheric Administration (NOAA) Fisheries Service biologists have identified steelhead (central coast evolutionary significant unit (ESU) is federally-listed as

threatened) populations in the lower portions of San Vicente Creek and in the main branch of Liddell Creek. While this is physically outside of the Boundary Expansion Area, hydrologic and water quality effects on the Liddell Spring and Plant Spring could affect Liddell Creek and its associated steelhead habitat. These effects are discussed in Section 6.3.2.3. The Boundary Expansion Area is outside of the San Vicente Creek watershed.

The Limestone Quarry is at the headwaters of the main (“middle”) and east branches of Liddell Creek (called “Liddell Creek” and “East Branch” on the USGS Davenport Quadrangle). The Liddell Spring and the Plant Spring both feed the East Branch. There is also a West Branch, which enters Liddell Creek about 2,000 feet upstream of the Pacific Ocean. The Limestone Quarry is about 13,000 feet upstream of the ocean. The total watershed of Liddell Creek is about three square miles. The watershed of the Limestone Quarry is about 125 acres, or 0.2 square mile. Hence the Limestone Quarry watershed represents a small portion of the Liddell Creek watershed.

The Liddell Creek system was studied by Sam McGinnis, Ph.D, Habitat Restoration Group, and Creegan and D’Angelo in the 1980’s and early 1990’s. Based on these studies, the 1996 EIR includes a description of the steelhead habitat in Liddell Creek, summarized as follows.

The Liddell Creek system is typical of a small, coastal, redwood forest creek complex. It exhibits little primary production (algae) and secondary production (aquatic insect larva) in most of its branches, and there is a moderate to high degree of embeddedness in most pool and riffle areas, meaning the rocks are buried in sand or sediment. Despite limited pool availability, steelhead parr have been observed in the creek. Summer rearing habitat restricts steelhead production because refuge cover is limited. Large rocks, under which fish may hide, are rare and relatively flat and embedded in sand. Many of the undercut banks where fish can hide are out of water during low summer flows. Water quality and temperatures are typically favorable for steelhead during the low-flow months.

McGinnis (County of Santa Cruz, 1996a&b) sampled sediments in the settlement basins and in the creek downstream of the basins and tested them for content of limestone and granite, with the purpose of determining whether the quarry was contributing most of the sedimentation to Liddell Creek. The results were that the settlement basins were capturing most of the sediment and that the quarry was contributing a small amount to the downstream watershed. The embeddedness in Liddell Creek was attributed mainly to natural erosion and weathering in the watershed, as opposed to surface runoff from quarry operations.

Quarry operations that affect steelhead conditions in Liddell Creek include water diversion from Plant Spring, and release of water from the settlement basins in the Limestone Quarry. Also, the City of Santa Cruz diverts water from Liddell Spring for the city water system, likely affecting steelhead habitat in the creek system.

The Bonny Doon Quarries operate under a General Permit for Storm Water Discharges Associated with Industrial Activities administered by the RWQCB. As required by the General Permit, a SWPPP, which identifies Best Management Practices in place, has been submitted to the RWQCB. All storm water runoff from the quarry is captured in the settlement basins. Controlled discharge from the settlement basins is monitored in compliance with the

requirements of the RWQCB. These controls help maintain water quality downstream of the Limestone Quarry.

Northern Maritime Chaparral

Northern maritime chaparral is listed as a sensitive habitat in the GP/LCP and in the CNDDDB. Less than 2,000 acres of this habitat exist in California, and it is considered threatened in the CNDDDB. This community type occurs on a ridge between the east and west forks of Liddell Creek, between Settlement Basins 2 and 3 (County of Santa Cruz 1996a&b). It consists of an overstory of knobcone pine trees and a dense understory of tall evergreen shrubs, including brittle-leaved Manzanita (*Arctostaphylos crustaceae* var. *crustaceae*), coyote brush, and warty-leaved ceanothus (*Ceanothus papillosus*). This plant community does not occur in the Boundary Expansion Area. This community is included in the Reclamation Plan.

Native Grassland

The GP/LCP and County of Santa Cruz Sensitive Habitat Protection Ordinance (Chapter 16.32 of the County Code) identify native grassland in the coastal zone as a sensitive habitat. Grassland dominated by native grass species is increasingly rare in California, having been outcompeted by non-native annual grasses and more often subject to development than coastal scrub or woodlands. Native grassland is dominated by native grass species such as needlegrass (*Nasella pulchra*; *N. cernua*), and California oatgrass (*Danthonia californica*), and herbs such as blue dicks (*Dichelostemma pulchellum*), soap plant (*Chlorogalum pomeridianum*), and coast tarweed (*Hemizonia corymbosa*). The Boundary Expansion Area does not contain native grassland. This community occurs in the biological study area, and the Reclamation Plan includes native grassland.

6.1.4 1996 Reclamation Plan Amendment

In accordance with the SMARA and County of Santa Cruz Mining Regulations (see Section 3.0), the two Bonny Doon quarries are operated under a reclamation plan. The purpose of the reclamation plan is to return areas impacted by mining to a stable state through soil and vegetation management. The Bonny Doon quarries reclamation plan has a complicated history, summarized in Section 2.0. The reclamation plan that is being implemented (“Reclamation Plan”) combines elements of the original 1996 plan, mitigation required in the EIR on that plan (adopted as 1997 Conditions of Approval for the COC and Reclamation Plan Approval; see Appendix B), and comments by the State Board of Mining and Geology (incorporated 1999).

While the Reclamation Plan identifies revegetation goals, one of the tasks in the Plan is to establish test plots to refine the methodology for achieving re-establishment of particular vegetation communities (see Figures 33, Limestone Quarry Existing Vegetation (2003) and Figure 34, Shale Quarry Existing Vegetation (2003) for the locations of individual test plots). These plots were established, and the results indicated that it may not be feasible to establish needlegrass grassland and maritime chaparral because of low-nutrient soil conditions. In 2001, CEMEX proposed a revised revegetation strategy as an amendment to the Reclamation Plan. The revised strategy takes into account natural vegetation communities at the site and in the region, and un-weathered, low-nutrient post-mining soil conditions. It proposes a simpler seed mix than the previous revegetation plan adopted in 1996 and finalized in 1999 (see Table 2-3 in Section 2.0), and initial establishment of just two habitat types. The strategy is that the less-weathered

soils will support the few plant species that appear earlier in the succession pattern, that those plants will help build the soil, and eventually the other species will invade the reclaimed areas.

The biological effects of the amended reclamation strategy are assessed in this chapter, since approval of the 1996 Reclamation Plan Amendment is a discretionary action by the County and is subject to CEQA review. The change in revegetation methods also requires an amendment to the COC.

The differences between the approved 1996 Reclamation Plan and the 1996 Reclamation Plan Amendment include changes in the planting plan that do not incorporate all of the sensitive habitats that would be or were previously lost to mining, and halting of the test plot studies. The species list is restricted to early successional shrub species and mid-successional mixed evergreen forest species. There is no provision for establishing the maritime chaparral, needlegrass grassland, or mixed grassland at the site. As with the approved 1996 Reclamation Plan, the 1996 Reclamation Plan Amendment includes the control of invasive exotic plant species.

In 2002, subsequent to the test plot results and development of the 1996 Reclamation Plan Amendment, previously stockpiled topsoil was located at the Shale Quarry site. The unexpected availability of topsoil provided the quarry with an opportunity to try and establish the vegetation communities that were previously unsuccessful in the test plots. A portion of the topsoil was distributed over a four-acre area of the Shale Quarry and seeded with needlegrass grassland species (see Figure 34). CEMEX intends to use the remaining topsoil to establish 12 acres of diverse native grassland—(three acres in the Shale Quarry and nine acres in the Limestone Quarry).

The 1996 Reclamation Plan specifies a 1:1 replacement of each vegetation community remaining to be impacted by the mining operation. The communities required for re-establishment include northern maritime chaparral, alluvial redwood forest, mixed evergreen forest, needlegrass grassland, diverse native grassland, northern coastal scrub, and riparian forest. The establishment of several vegetation communities at the quarry has shown signs of success (Figure 33 and Figure 34). The planting of needlegrass grassland, northern maritime chaparral, and northern coast scrub may ultimately satisfy the condition that was outlined as Mitigation Measure VEG-5 in the 1996 EIR (Table 2-2) and adopted as COC Condition of Approval III.D.6 when the performance standards outlined in Measure BIO-5 are satisfied.

The ultimate goal of the 1996 Reclamation Plan Amendment is to restore 211.4 acres of the Limestone Quarry to early successional shrub and mixed evergreen forest, approximately 7 acres to mixed evergreen forest (already established in Disposal Area A), and 4.6 acres to riparian habitat. Eleven species would be planted, as listed in Table 2-3, and in Table 6-1 below. Hence, the proposed plan would establish mixed evergreen forest and northern coastal scrub (Table 2-2). However, it would not establish maritime chaparral and does not include grassland species.

Table 6-1	
Vegetation Communities and Species Specified in the 1996 Reclamation Plan Amendment	
Common name	Scientific name
Early Successional Shrub Mix	
California sage	<i>Artemisia californica</i>
Coyote brush	<i>Baccharis pilularis</i>
Coffee berry	<i>Rhamnus californica</i>
Sticky monkey flower	<i>Mimulus aurantiacus</i>
Bush lupine	<i>Lupinus arboreus</i>
Blue blossom	<i>Ceanothus thyrsiflorus</i>
Lizard tail	<i>Eriophyllum staechadifolium</i>
Mid-successional Mixed Evergreen Forest	
Douglas fir	<i>Pseudotsuga menziesii</i>
Tanoak	<i>Lithocarpus densiflorus</i>
Coast live oak	<i>Quercus agrifolia</i>
Madrone	<i>Arbutus menziesii</i>
Sticky monkey flower	<i>Mimulus aurantiacus</i>
Bush lupine	<i>Lupinus arboreus</i>
Lizard tail	<i>Eriophyllum staechadifolium</i>

Source: Madrone Landscape Group, 2006.

In addition, the COC Conditions of Approval and the SMGB required that test plots be used to improve revegetation methods and measure potential success. The 1996 Reclamation Plan Amendment does not include the use of test plots.

6.2 REGULATORY SETTING

6.2.1 Local

Local regulations pertaining to the project are described in Section 3.0. Those that apply to biological resources include the Sensitive Habitats Protection Ordinance, the GP/LCP, Mining Regulations 16.54.050 Required Conditions and Standards, and Mining Regulations 16.54.055 Reclamation Standards.

6.2.2 State

6.2.2.1 California Department of Fish and Game

California Endangered Species Act.

Under the California Endangered Species Act (CESA), CDFG has the responsibility for maintaining a list of threatened species and endangered species (California Fish and Game Code Section 2070). The CDFG also maintains a list of "candidate species," which are species that the CDFG has formally noticed as being under review for addition to either the list of endangered species or the list of threatened species. The CDFG also maintains lists of "CSC" that serve as "watch lists." Mining in the proposed Boundary Expansion Area could adversely affect CDFG species of special concern.

CSC are species that are declining at a rate that could result in listing under the federal Endangered Species Act (ESA) or the CESA, and/or have historically occurred in low numbers, and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals and is intended to focus attention on the species to help avert the need for costly listing under federal and state endangered species laws. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them (CDFG, 2003).

As a trustee agency, CDFG comments on the biological impacts of development projects reviewed under CEQA. As such it must consider species listed as endangered or threatened, candidate species, and species of special concern. It does not have permit authority over the project unless the project would impact a state listed species.

Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present in the project area and determine whether the proposed project would have a potentially significant impact on such species. In addition, the Department encourages informal consultation on any proposed project that could impact a candidate species or a species of special concern.

The Boundary Expansion Area is known to contain the SFDW (CSC), and may provide upland habitat for CRLF (FT; CSC). Once it was determined that the project would unavoidably impact SFDW, CDFG was informally consulted to determine appropriate mitigation measures. No formal consultation was initiated because CDFG has yet to adopt a protocol containing specific requirements for mitigating impacts to the SFDW. The quarries are operated under the provisions of a federal HCP designed to minimize the effects of take of CRLF.

Streambed Alteration Agreement

California Fish and Game Code Sections 1600-1607 require the notification of CDFG for any activity that could affect the bed, bank or channel of any stream that has value to fish and wildlife. Upon notification, the CDFG has the responsibility to develop mitigation measures and enter into Streambed Alteration Agreements (SAA) with applicants who propose projects that would obstruct the flow of, or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams.

The Limestone and Shale Quarries operate in the Liddell Creek and San Vicente Creek watersheds. Encroachment upon these drainages is subject to regulation by CDFG under Section 1603 of the Fish and Game Code and is subject to a SAA. CDFG issued SAA #849-95 for impacts to Liddell Creek caused by expansion of Disposal Area C in the Limestone Quarry. In the past the quarry operator has also obtained SAAs for cleaning out the settlement basins, and is currently working on an SAA for that purpose. The proposed Boundary Expansion Area is located on the eastern side of the Limestone Quarry slopes and would not alter the bed, bank or channel of a stream. A SAA is not required for the project.

California Fish and Game Code

A variety of species are protected under the California Fish and Game Code, separate from the protection afforded under the CESA. For example, birds that do not qualify as game birds, migratory game birds, or fully protected birds may be protected under Sections 3503, 3503.5 and 3800 of the Fish and Game Code.

Section 3503 simply states, “it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.” The exceptions generally apply to species that are causing economic hardship to an industry.

Section 3503.5 states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted.”

Section 3800 contains provisions that apply specifically to mining operations. Under this section, “all birds occurring naturally in California that are not resident game birds, migratory game birds, or fully protected birds are nongame birds. It is unlawful to take any nongame bird except as provided in this code or in accordance with regulations of the commission or, when relating to mining operations, a mitigation plan approved by the department.” The section specifies that a mitigation plan be provided to CDFG for approval. The mitigation plan is to include methods of avoiding take and to provide reasonable and practicable methods of mitigating the unavoidable take of birds and mammals caused by mining operations. This EIR includes mitigation measures for impacts to birds.

The mountain lion is a “specially protected” species under Sections 4800 *et seq.* of the Fish and Game Code. It is unlawful to take mountain lion except in instances and methods allowed in the Fish and Game Code.

Certain species are also “fully-protected”. This classification was the state's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds and mammals. Most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the species for the protection of livestock. The only fully-protected species that could occur in the biological study area is white-tailed kite. This species has a low potential to nest in the coast live oak forest in the Boundary Expansion Area.

6.2.3 Federal

6.2.3.1 U.S. Fish and Wildlife Service and NOAA Fisheries

Federal Endangered Species Act

Under the ESA, the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 USC 1533[c]). Pursuant to the

requirements of ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed threatened or endangered species could be present in the project area and determine whether the proposed project would have a potentially significant impact on such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species that is proposed for listing under ESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]).

The USFWS also publishes a list of candidate species. Species on this list receive "special attention" from federal agencies during environmental review, although they are not protected otherwise under the ESA. The candidate species are taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened.

Three federally-listed species are known to occur in the biological study area. The CRLF occurs in the Liddell Creek drainages and in settlement basins at the Limestone Quarry. Coho salmon and steelhead are known to occur in San Vicente Creek. Steelhead also occurs in Liddell Creek downstream of the project area. However, because San Vicente Creek is located outside of the watershed of the Limestone Quarry, no impacts to Coho salmon are anticipated. An HCP (Toyon, 1999) for the CRLF was issued in August of 1999, and is in effect to mitigate for incidental take that may occur during routine maintenance of the settlement basins. In addition, the Bonny Doon Shale and Limestone Quarries were both excluded from critical habitat designation by USFWS because "designating critical habitat has little benefit in areas covered by the Bonny Doon HCP" (50 CFR Part 17).

Both Liddell Creek and San Vicente Creek are designated as critical habitat for coho salmon and steelhead. Under the ESA, critical habitat is defined as "the specific areas within the geographic area occupied by a species on which are found those physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such are essential for the conservation of the species." The purpose of designating critical habitat is to inform other federal agencies and interested parties that the habitat is important and effects on the habitat must be considered when approving any project in critical habitat. It does not specifically protect these areas or restrict activities in them.

Migratory Bird Treaty Act

Raptors (birds of prey), migratory birds, and other avian species are protected by the federal Migratory Bird Treaty Act (MBTA 16 U.S.C., Sec. 703-711). The USFWS implements the MBTA, which prohibits the take of migratory birds listed in 50 CFR Part 10, and includes take of nests, eggs, or bird products. Take under the MBTA includes killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of Interior, and Section 3503.5 of the California Fish and Game code, which states that it is "unlawful to take, possess, or destroy any birds in the Order Falconiformes or Strigiformes or to take, possess, or destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Activities that would cause nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is also considered a take."

This regulation pertains to any shrub or tree that would be affected or removed by the proposed project that could affect the nesting of migratory birds. Activities that occur during critical phases of the nesting cycle would need to be rescheduled unless surveys by a qualified biologist determine that nests, eggs, or nesting birds would not be disturbed, and would be subject to approval by CDFG and USFWS.

6.3 PROJECT IMPACTS

6.3.1 Thresholds of Significance

The following thresholds of significance are adapted from the County Environmental Review Initial Study Checklist and the Initial Study Checklist included in the CEQA *Guidelines Appendix G*. A project would have a significant biological impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Affect a unique or fragile biotic community (riparian corridor, wetland, coastal grassland, special forests, intertidal zone, etc.);
- Change the diversity of species, or number of species of plants or animals;
- Conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The proposed Limestone Quarry Boundary Expansion Area would adversely affect a special status species (SFDW), and sensitive habitat as defined by local ordinance (oak woodland and northern coastal scrub), and conflicts with the County's Sensitive Habitat Protection Ordinance. It would not affect wetlands or riparian habitat, interfere with wildlife movement, affect a unique or fragile biotic community, or conflict with the HCP adopted for the site.

6.3.2 Proposed Boundary Expansion Area

6.3.2.1 Vegetation Communities

The Limestone Quarry Boundary Expansion Area would result in the removal of 17.1 acres of native vegetation (see Figure 35 and Table 6-2). The Boundary Expansion Area contains 11.4 acres of upland redwood forest, 2.5 acres of northern coastal scrub (coyote brush/poison oak), 2.3 acres of mixed evergreen forest (Douglas fir-tanoak), and 0.9 acre of coast live oak forest.

The upland redwood forest and mixed evergreen forest are not designated as sensitive habitats. The area of these vegetation communities to be removed by the project is not significant when viewed in context of the abundant forested land containing these communities that remain in the project vicinity and throughout the Santa Cruz Mountains. The small areas of northern coastal scrub and coast live oak forest qualify as sensitive habitats under the County's Sensitive Habitats Protection Ordinance and GP/LCP. The removal of 2.5 acres of the northern coastal scrub and 0.9 acre of coast live oak forest is a significant impact because these are identified as sensitive vegetation communities in a local plan. These communities would be replaced under the revegetation plan that is part of the Mitigated 1996 Reclamation Plan Amendment (see Table 6-2) as modified by Measure BIO-3.

Vegetation Community	Acreage Impacted	Revegetation Plan Acreage
Upland Redwood Forest	11.4	--
Mixed evergreen forest	2.3	--
Coast Live Oak Forest	0.9	0.9 ¹
Northern Coastal Scrub	2.5	--
Northern Coastal Scrub & Mixed Evergreen Forest	--	16.2 ²
Total	17.1	17.1

Notes:

1. The 16.2-acre mitigation area is intended to reclaim 11.4 acres of upland redwood forest, 2.3 acres of mixed evergreen forest, and 2.5 acres of northern coastal scrub.
2. Measure BIO-3 contains 0.9 acre of coast live oak forest for incorporation into the Mitigated 1996 Reclamation Plan Amendment.

Source: TRA Environmental Sciences, Inc., 2006.

6.3.2.2 Wildlife

The Limestone Quarry Boundary Expansion Area contains high quality upland wildlife habitat for common regionally occurring wildlife species including mammals, birds, amphibians, reptiles and insects. These species include mule deer and mountain lion, which were observed in the Boundary Expansion Area during wildlife surveys conducted by TRA. While the forest vegetation is not listed as a special status habitat (see Appendix C, Table 3), the mining expansion would result in removal of 17.1 acres of nesting, denning and foraging habitat from this area. Considering the regional context of this project, the loss of 17.1 acres of redwood forest and assorted upland habitats is a less than significant impact for the survival and reproductive capability of regionally-occurring wildlife species. Clearing would occur in phases (over two years), so that the removal of wildlife habitat would be somewhat gradual. Clearing is proposed to occur from the late spring into the summer months, which is the primary breeding season for wildlife. Measure BIO-4 recommends that clearing occur in the late summer/early fall in order to avoid the breeding season in order to protect the year's brood and to reduce the actual number of animals directly impacted by the project. Revegetation through site reclamation activity would slowly restore biological value to the Boundary Expansion Area. Implementation of the Mitigated 1996 Reclamation Plan Amendment revegetation plan would

reduce the loss of wildlife habitat through in-kind replacement of sensitive vegetation communities and the revegetation of all other areas with native species.

Raptors are protected by state and federal law. Raptor nesting activity was not observed in the Boundary Expansion Area during site surveys. However, it is feasible that raptors could establish nests in this forested area before timber harvest/mining expansion activity begins. Impacts to nesting raptors (including those that are species of concern (Cooper's hawk, long-eared owl, golden eagle, and sharp-shinned hawk), and/or fully protected (white-tailed kite)) would be considered a significant impact.

Nongame birds are protected under California Fish and Game Code Sections 3500 and 3800, which prohibit the removal of nests and require a mitigation plan for mining operation impacts on nongame birds. Migratory birds and other avian species are also protected under the MBTA. The MBTA prohibits removal of nests, eggs, or birds, and prohibits activities that result in nest abandonment.

Impacts to nesting birds, including raptors and nongame birds, can be reduced to a less than significant level through pre-construction surveys or by scheduling timber harvesting and overburden removal for late summer/early fall, outside of the breeding season. These steps are identified in Measure BIO-4 below. In addition, the preservation of habitat for SFDW would also protect nesting habitat for birds, and the revegetation of impacted areas of the quarry would restore native habitat that could be used by nesting birds. With the implementation of these measures, impacts on nesting birds would be less than significant.

6.3.2.3 Special Status Species

Special Status Plant and Vegetation Communities

The Boundary Expansion Area does not contain special-status plant species, and would not impact them either directly or indirectly. Although the Boundary Expansion Area contains a diverse and intact assemblage of the native flora, no rare or endangered plant species were located during several field surveys of the 17.1-acre Boundary Expansion Area. These surveys were conducted during both the late and early flowering season.

The Boundary Expansion Area contains 2.5 acres of northern coastal scrub, and 0.9 acre of coast live oak forest. These are identified as locally unique biotic communities in the GP/LCP and are protected under the County's Sensitive Habitat Protection Ordinance. Because of their status as sensitive habitats, the loss of northern coastal scrub and coast live oak forest would be considered a significant impact. These communities would be replaced on the site under the Mitigated 1996 Reclamation Plan Amendment, which reduces the impact to less than significant (see Table 6-3 and Measure BIO-3).

**Table 6-3
Comparison of the Approved and Proposed Reclamation Plans by Vegetation Community (Acres)**

Vegetation Community ¹	1996 Reclamation Plan (Approved) ²		1996 Reclamation Plan Amendment (Proposed Project) ²		Mitigated 1996 Reclamation Plan Amendment ^{2,6}	
	Shale Quarry	Limestone Quarry	Shale Quarry	Limestone Quarry	Shale Quarry	Limestone Quarry
Needlegrass Grassland & Northern Maritime Chaparral	59.8	50.0	--	--	--	--
Needlegrass Grassland, Northern Maritime Chaparral & Mixed Evergreen Forest	19.1	--	--	--	--	--
Needlegrass Grassland	7.4	--	--	--	4.0	--
Diverse Native Grassland	--	--	--	--	3.0	9.0
Mixed Evergreen Forest & Northern Maritime Chaparral	8.3	--	--	--	--	--
Mixed Evergreen Forest	--	34.8	--	7	--	--
Redwood Forest	--	11.2	--	--	--	--
Redwood Forest & Northern Maritime Chaparral	--	9.6	--	--	--	--
Northern Maritime Chaparral	--	7.1	--	--	4.5	--
Northern Coastal Scrub	--	--	96.8	--	--	--
Northern Coastal Scrub & Mixed Evergreen Forest	--	--	--	211.4 ⁷	85.3	208.5 ^{7,8}
Redwood Forest	--	--	1.5	--	1.5	--
Riparian	--	--	0.85	4.6	0.85	4.6
Coast Live Oak Forest	--	--	--	--	--	0.9
Limestone Pit ³	--	56.0	--	--	--	--
Other Area ⁴	--	18.0	--	--	--	--
Area C Expansion ⁵	--	20.0	--	--	--	--
Subtotal in Acres	94.6	206.7	99.2	223.0	99.2	223.0
Total Acres	301.3		322.2⁹		322.2⁹	

Notes:

- For consistency, community groupings adapted from revegetation plan maps and community names adapted from: Holland, Robert F., 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Prepared for the California Department of Fish and Game, Sacramento, California.
- Mitigation Measure VEG-5 from 1996 EIR specifies minimum acreages for specific vegetation communities: Needlegrass Grassland (4), Diverse Native Grassland (12), Mixed Evergreen Forest (46), Northern Maritime Chaparral (4.5), Northern Coastal Scrub (2.5), Riparian (0.5), Redwood Forest (1.5). A subsequent revegetation plan incorporating the 1996 EIR mitigation was never approved by the Planning Department. However, the entire 71 acres of mitigation required by Measure VEG-5 is contained in the total acreage.
- Vegetation community(s) not specified in 1996 Reclamation Plan.
- Estimate of mapping margin of error in 1996 Reclamation Plan for Limestone Quarry.
- Estimate of additional area represented by expansion of Disposal Area C in Limestone Quarry in 1996 Reclamation Plan.
- The 2005 Alternative Revegetation Plan has been incorporated as mitigation (see Measure BIO-3).
- The northern coastal scrub/mixed evergreen forest acreages do not include the 9.4 acres of remaining area included in Figures 13 and 32.
- Acreage includes unspecified area of created seasonal wetlands within the quarry floor (see Measure HYD-1).
- Total acreage incorporates mitigation for 17.1 acres of impacts associated with the proposed Boundary Expansion Project. The remaining difference is attributed to advances in mapping accuracy since 1996.

Source: County of Santa Cruz, 2007.

California Red-legged Frog

The proposed Boundary Expansion Area would not result in direct impacts to CRLF breeding habitat. No modifications are proposed to the settlement basins or to the habitat maintenance requirements specified in the HCP for the Quarry settlement basins. Project implementation would not reduce the viability or management opportunities of CRLF in the region, and would not adversely affect the existing HCP. However, the boundary expansion could affect water quality and quantity in Liddell Creek and Settlement Basin 3. Thus, CRLF could be indirectly adversely affected by changes in water quality and/or quantity.

Impacts to water quality and water quantity are explained in Section 5.0 and would be fully mitigated through the implementation of Measure HYD-1, as described below. Erosion control measures are included in the mining plan to reduce sediment load to the settlement basins, and these basins are periodically dredged under a mitigation plan implemented through the HCP for the site.

Water Quality and Quantity. Mining of the Boundary Expansion Area would continue the existing impact of sediment from quarry activity entering Liddell Spring from percolating runoff. By increasing the sediment entering Liddell Spring, the mining expansion project could indirectly increase the sediment loads discharged from the spring to downstream drainages of Liddell Creek that support CRLF. According to Nolan Associates, 1997, several lines of evidence suggest that past and ongoing quarry activities have contributed to Liddell Spring turbidity, and it is reasonable to conclude that such impacts would continue with the proposed Boundary Expansion Area. In addition, the sediment discharged from Liddell Spring due to quarry activities represents an additional sediment load for the natural drainage system downstream of the spring. Sedimentation of the downstream channel could adversely impact listed species habitat. This could result in a potentially significant impact.

Measure HYD-1 in Section 5.0 identifies recommendations for developing an alternate drainage scheme so as to reduce impacts of Boundary Expansion Area quarrying related to both water quality and water quantity. When incorporated into the Final Drainage Plan, these recommendations would also help restore pre-quarry hydrologic and hydrogeologic conditions over time. Implementation of the drainage plan provisions would control runoff in the expanded mining area, reduce runoff exposure to sediment sources, reduce exposure of rock fissures and voids to runoff containing sediment, and remove sediment from runoff entering the ground water through the quarry floor. These measures would reduce the turbidity impacts on Liddell Spring and sedimentation of downstream drainages. This measure would also preserve existing water quantity entering the Liddell Creek system. With these measures, mining of the proposed Boundary Expansion Area would not adversely affect CRLF habitat in Liddell Creek.

Erosion Control. Implementation of the erosion control and revegetation measures detailed in Section 3 of the Reclamation Plan for the Bonny Doon Quarries would minimize potential erosion and sedimentation from the proposed expansion. The HCP specifies mitigation measures designed to avoid and minimize impacts to the CRLF during settlement basin cleaning, maintenance activities, and water level management. Yearly monitoring reports are submitted to the USFWS. With these measures in place, increased sediment load and need for pond maintenance resulting from the Expansion Project would not significantly impact CRLF.

San Francisco Dusky-footed Woodrat

Land clearing and mining in the Boundary Expansion Area would result in the loss of 17.1 acres of SFDW habitat that contains 53 SFDW houses, 40 of which were active in June 2006. It is estimated that about 40 SFDW individuals may be displaced and/or killed due to land clearing activities. This would be considered a significant impact.

SFDW displaced during land clearing activities could escape to undisturbed adjacent habitats and possibly survive there depending on whether those areas provide suitable habitat and are not at carrying capacity for SFDW. Suitable habitat for SFDW adjacent to the Boundary Expansion Area includes mixed evergreen and redwood forest in the 1,000-foot setback between the Legal Mining Limit and the eastern property boundary (“buffer zone”), mixed evergreen forest to the south and coastal scrub to the north. These areas have been observed to contain SFDW, but it is not known if they are at carrying capacity.

A step-wise program is proposed to mitigate the loss of suitable occupied SFDW habitat within the Boundary Expansion Area. The program is included in Measures BIO-1 and BIO-2. It includes additional data collection about SFDW habitat use in the Boundary Expansion Area, selection of one of three suitable sites for permanent protection of SFDW habitat at a 1:1 ratio, and both passive and active relocation of SFDW out of the Boundary Expansion Area prior to timber harvest or land clearing. The possible mitigation sites are shown in Figure 36, Woodrat Mitigation Sites at Limestone Quarry, and Figure 37, Woodrat Mitigation Parcel at San Vicente Quarry. With implementation of Measures BIO-1 and BIO-2, the project impacts to SFDW would be reduced to a less than significant level.

Central Coast Steelhead/North Central Coast California Steelhead Stream Habitat

Central coast steelhead occurs in Liddell Creek and San Vicente Creek. Overburden removal and mining activity in the Boundary Expansion Area of the Limestone Quarry has the potential to increase sediment loads entering Liddell Spring and Settlement Basin 3 that discharge to the East Branch of Liddell Creek. The potential water quality impacts of the project are addressed in Hydrology (Section 5.0). If increased sediment loads entering Basin 3 are discharged to Liddell Creek, or if increased sediment entering Liddell Spring is discharged, downstream water quality and spawning habitat of the Central Coast steelhead, and critical habitat of both the steelhead and coho salmon could be adversely impacted.

The mining expansion project does not propose changes to the existing quarry settlement basins. Settlement Basin 3 has adequate capacity to handle flows from the Boundary Expansion Area (see Hydrology, Section 5.2.2.1). Monitoring of the pond discharges is routinely conducted and submitted to the County at quarterly inspections. With implementation of existing water quality controls, sedimentation impacts on steelhead habitat from water discharged through Settlement Basin 3 is less than significant.

Overburden removal and mining in the Boundary Expansion Area could increase the sediment load entering Liddell Spring resulting in higher turbidity levels. The resulting water quality impacts are addressed in Hydrology, Section 5.2.3.3. Higher sediment levels in Liddell Spring could adversely impact downstream steelhead habitat in the lower reaches of Liddell Creek. Implementation of drainage controls identified in Measure HYD-1 would mitigate water quality impacts, and prevent sedimentation impacts on steelhead and coho habitat in Liddell

Creek by the mining expansion. In addition, Measure HYD-1 prevents a reduction in water quantity into Liddell Spring by continuing to hold water in the quarry floor rather than diverting it to Settlement Basin 3.

The quarry expansion project would extend the life of the Limestone Quarry for three years resulting in the continuation of Quarry water diversions at Plant Spring. CEMEX diverts up to 21 gpm (927,000 gallons per month) during summer months mostly for dust control purposes. The current rate of water use would not be changed by the expansion project.

Both Plant Spring and Liddell Spring contribute flows to Liddell Creek steelhead habitat. Plant Spring has an average flow rate of about 300 acre-feet per year (184 gpm, with a range of 66 to 338 gpm) and the mean average flow of Liddell Spring is about 1,500 acre-feet per year or 930 gpm (range of 760 to 1,720 gpm; Hydrology Section 5.1.1.1). While the Plant Spring reacts to yearly seasonal rainfall, the Liddell Spring does not and its water supply is more consistent. Plant Spring is about 1,400 ft east of Liddell Spring. In summary, Plant Spring contributes one-fifth of the amount of Liddell Spring, and the contribution occurs mainly during and just after the rainy season.

Liddell Spring and Plant Spring are not the only sources of water for Liddell Creek. The watershed drains about three-square miles of area, and other springs and surface flow contribute to the creek.

The Liddell Creek steelhead habitat suffers from low base-flow conditions during summer months. The project's extension of water diversion at Plant Spring for three more years would continue current project effects on low summer base-flows for steelhead in Liddell Creek, but would not increase them. The Plant Spring provides less water to Liddell Creek than the Liddell Spring. Since its flow naturally drops in the summer, it may never have supplied significant summer flow to Liddell Creek, although cumulatively the contribution could have been important. It is unlikely that quarry diversion of Plant Spring flows in the summer by itself would adversely affect steelhead rearing habitat. However, the diversion does have an existing cumulative effect with the City's considerable diversion of flows from Liddell Spring (1,250 acre-feet per year since water year 1972 out of a total mean annual flow of 1500 acre-feet per year).

Given the small contribution of Plant Spring to base-flows of Liddell Creek, and the small quantity of water diverted from Plant Spring for quarry operations, the continued water use by the quarry under the proposed mining expansion project would not significantly impact steelhead habitat.

6.3.3 1996 Reclamation Plan Amendment

Based on the species list and communities included in the 1996 Reclamation Plan Amendment, the quarries would be revegetated with coastal scrub and mixed evergreen forest. In addition, areas of sensitive redwood forest and riparian woodland would be preserved. The revised plan does not mitigate for the loss of all of the sensitive habitats known to occur at the site as required in COC Conditions of Approval (see Section 3.6). Specifically, it does not address northern maritime chaparral or native grasslands (either needlegrass grassland or diverse native grassland).

Northern maritime chaparral and native grassland are sensitive habitats. The removal of these communities by mining activities is a significant impact. Because it has been demonstrated that these communities can be re-established at the site, they are proposed as mitigation and have been included in the Mitigated 1996 Reclamation Plan Amendment.

Otherwise, the approach of installing early successional species in order to develop soil structure that would eventually support climax communities native to the site is valid, and would not have adverse biological effects. The 1996 Reclamation Plan Amendment continues with activities such as control of non-native invasive plants, which would benefit the native habitats.

The 1996 Reclamation Plan Amendment does not include test plots. These are important to test and refine revegetation methods. It is recommended that test plots continue to be used in the reclamation plan.

Topsoil from the Boundary Expansion Area would be removed and stockpiled in Disposal Area C for future use in revegetation. The stockpile locations are mapped on the Disposal Area C Topsoil Stockpile Plan (Bowman & Williams Sheet 6 of the Mining Plan Amendment). The proposed 1996 Reclamation Plan Amendment states that topsoil would be stockpiled "to the extent possible" and provides no further detail concerning its collection, storage and redistribution. However, the County Mining Regulations Section 16.54.055(h) specifies that topsoil and growth media must be removed and stockpiled separately for future use in revegetation efforts. Stockpiles are to be clearly identified so as to be distinguished from mine waste and not disturbed by ongoing fill activity of Disposal Area C. Measures must also be implemented to protect the stockpiles from wind and water erosion and weeds. With this modification to the proposed 1996 Reclamation Plan Amendment (see Measure BIO-6), the project would conform to the Reclamation Performance Standards for Topsoil Salvage, Maintenance, and Redistribution.

An updated revegetation plan (RMC Pacific Materials Bonny Doon Quarries Alternative Revegetation Plan 2005; November 2005, revised February 2006) has been prepared in order to address the sensitive habitats and test plots (Appendix D) proposed for elimination in the 1996 Reclamation Plan Amendment. It is now being recommended that the proposed 1996 Reclamation Plan Amendment be revised to incorporate the 2005 Alternative Revegetation Plan approach to revegetation. This revised approach would again provide for the establishment of sensitive habitats, update the revegetation maps to show that sensitive habitats are currently under establishment, and would reinstate the use of test plots. Table 6-4 provides a comparison of vegetation communities and species specified in the 1996 Reclamation Plan Amendment and the Mitigated 1996 Reclamation Plan Amendment. The mitigated plan would meet and exceed current conditions of approval by incorporating current site knowledge that is based on several years of test plots and monitoring. This recommendation is included as Measure BIO-3. These revisions are also summarized in Table 6-3.

Table 6-4	
Comparison of Vegetation Communities and Species Specified in the 1996 Reclamation Plan Amendment and the Mitigated 1996 Reclamation Plan Amendment	
1996 Reclamation Plan Amendment	Mitigated 1996 Reclamation Plan Amendment
Common Name (Scientific Name)	Common Name (Scientific Name)
<p><u>Early Successional Scrub Mix</u> California sage (<i>Artemisia californica</i>) Coyote brush (<i>Baccharis pilularis</i>) Coffeeberry (<i>Rhamnus californica</i>) Sticky monkey flower (<i>Mimulus aurantiacus</i>) Bush lupine (<i>Lupinus arboreus</i>) Blue blossom (<i>Ceanothus thyrsiflorus</i>) Lizard tail (<i>Eriophyllum staechadifolium</i>)</p> <p><u>Mid-successional Mixed Evergreen Forest</u> Douglas fir (<i>Pseudotsuga menziesii</i>) Tanoak (<i>Lithocarpus densiflorus</i>) Coast live oak (<i>Quercus agrifolia</i>) Madrone (<i>Arbutus menziesii</i>) Sticky monkey flower (<i>Mimulus aurantiacus</i>) Bush lupine (<i>Lupinus arboreus</i>) Lizard tail (<i>Eriophyllum staechadifolium</i>)</p>	<p><u>Early Successional Scrub/Mixed Evergreen Forest</u> California sage (<i>Artemisia californica</i>) Coyote brush (<i>Baccharis pilularis</i>) Coffeeberry (<i>Rhamnus californica</i>) Sticky monkey flower (<i>Mimulus aurantiacus</i>) Bush lupine (<i>Lupinus arboreus</i>) Blue blossom (<i>Ceanothus thyrsiflorus</i>) Lizard tail (<i>Eriophyllum staechadifolium</i>) Deerweed (<i>Lotus scoparius</i>) Madrone (<i>Arbutus menziesii</i>) Yellow Yarrow (<i>Eriophyllum confertiflorum</i>) Tanoak (<i>Lithocarpus densiflorus</i>) California wax myrtle (<i>Myrica californica</i>) Coast redwood (<i>Sequoia sempervirens</i>) Douglas-fir (<i>Pseudotsuga menziesii</i>) Knobcone Pine (<i>Pinus attenuata</i>) Blue wild rye (<i>Elymus glaucus</i>)</p> <p><u>Diverse Native Grassland</u> California brome (<i>Bromus carinatus</i>) Blue wild rye (<i>Elymus glaucus</i>) Meadow barley (<i>Hordeum branchyantherum</i>) Purple needlegrass (<i>Nassella pulchra</i>) California oat grass (<i>Danthonia californica</i>) California aster (<i>Lessingia filaginifolia</i> var. <i>filaginifolia</i>) California poppy (<i>Eshscholzia californica</i>) Pursh’s trefoil (<i>Lotus purshianus</i>) Annual lupine (<i>Lupinus nanus</i>) Blue-eyed grass (<i>Sisyrinchium bellum</i>) Yellow Yarrow (<i>Eriophyllum confertiflorum</i>)</p> <p><u>Needlegrass Grassland</u> California brome (<i>Bromus carinatus</i>) Blue wild rye (<i>Elymus glaucus</i>) Meadow barley (<i>Hordeum branchyantherum</i>) Purple needlegrass (<i>Nassella pulchra</i>) California oat grass (<i>Danthonia californica</i>) Pursh’s trefoil (<i>Lotus purshianus</i>) Annual lupine (<i>Lupinus nanus</i>) Blue-eyed grass (<i>Sisyrinchium bellum</i>) Yellow yarrow (<i>Eriophyllum confertiflorum</i>)</p> <p><u>Northern Maritime Chaparral</u> Knobcone pine (<i>Pinus attenuata</i>) Brittle-leaved manzanita (<i>Arctostaphylos tomentosa</i> <i>crustacea</i>) Chamise (<i>Adenostoma fasciculatum</i>) Warty-leaved ceanothus (<i>Ceanothus papillosus</i>) Deerweed (<i>Lotus scoparius</i>) California sage (<i>Artemisia californica</i>) Madrone (<i>Arbutus menziesii</i>) Coyote brush (<i>Baccharis pilularis</i>) Yellow yarrow (<i>Eriophyllum confertiflorum</i>) Buckwheat (<i>Eriogonum latifolium</i>)</p>

Table 6-4	
Comparison of Vegetation Communities and Species Specified in the 1996 Reclamation Plan Amendment and the Mitigated 1996 Reclamation Plan Amendment	
1996 Reclamation Plan Amendment	Mitigated 1996 Reclamation Plan Amendment
Common Name (Scientific Name)	Common Name (Scientific Name)
	Tanoak (<i>Lithocarpus densiflorus</i>) Coast live oak (<i>Quercus agrifolia</i>) Sticky monkey flower (<i>Mimulus aurantiacus</i>) California brome (<i>Bromus carinatus</i>) Blue wild rye (<i>Elymus glaucus</i>)

Source: Madrone Landscape Group, 2006 (Appendix D).

The proposed 1996 Reclamation Plan Amendment should also be revised to reflect modified planting conditions on the quarry floor resulting from drainage changes made in response to hydrology and water quality concerns. Under Measure HYD-1, overburden would be placed across the entire quarry floor and constructed with a drainage retention area and filter. Part 7 of Measure HYD-1 states:

The revegetation plan specified in the 1996 Reclamation Plan Amendment (as modified by the 2005 Alternative Revegetation Plan per Measure BIO-3) shall include species that can tolerate wet conditions for areas on the quarry floor receiving additional retention due to the modified drainage plan. The revised revegetation plan shall be developed by CEMEX for approval by County Planning prior to public hearing of the project proposal.

Thus, Measure BIO-3 includes a recommendation that the proposed 1996 Reclamation Plan Amendment be modified to incorporate vegetation suitable for the quarry floor.

6.3.4 Cumulative Impacts

“Cumulative impacts” refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (Section 15355 of the CEQA Guidelines). A cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts (e.g., removal of sensitive habitat).

According to County records (see Appendix E), there are no current or proposed projects in the Bonny Doon community planning area that would result in a substantial impact to biological resources with the exception of the Bonny Doon Limestone Quarry Boundary Expansion Project. In addition to the proposed project, the Limestone Quarry contains an unmined balance of 9.4 acres within the Legal Mining Limit that could potentially be mined in the foreseeable future. However, development of that acreage would be required to undergo a separate environmental review if an application were filed with the County. The possible future expansion of the Limestone Quarry into the remaining 9.4 acres would contribute incrementally to impacts on biological resources in the project vicinity. Of particular concern are the effects on

special-status species and sensitive vegetation communities, including the SFDW, the CRLF, steelhead, northern coastal scrub, and coast live oak forest. However, quarry effects on CRLF caused by operations and maintenance have been addressed and mitigated through an HCP and Section 10(a) permit for the site (Toyon Environmental Consultants, Inc., 1999).

The SFDW was found in all of the vegetation communities within the proposed Boundary Expansion Area, including coast live oak forest, northern coastal scrub, mixed evergreen forest, and redwood forest. The remaining 9.4-acre area contains coast live oak forest and northern coastal scrub, preferred habitats for SFDW. Mitigation for impacts to SFDW resulting from the proposed Boundary Expansion Area includes preservation of unmined habitat nearby and relocation of individuals. During subsequent CEQA review, the County would specify similar measures that would address impacts associated with the possible future expansion into the 9.4-acre remaining area, thereby reducing potentially significant cumulative impacts to a less than significant level. Mitigation for the proposed project would also fully mitigate cumulative effects.

Without implementation of the specified mitigation, the proposed project would result in adverse effects on steelhead habitat in Liddell Creek in terms of water quality (increased turbidity) and water quantity resulting from an increase in the active mining area. However, these effects would be mitigated through the implementation of Measure HYD-1, which redesigns the previously approved drainage of the quarry floor to filter surface water by allowing it to percolate back into the groundwater through a constructed filter bed. In combination with the proposed project as mitigated, the County would specify a similar measure that would address impacts associated with the possible future expansion into the 9.4-acre remaining area, thereby reducing potentially significant cumulative impacts to a less than significant level.

In recent years, low-flow conditions in Liddell Creek have limited steelhead reproduction, due in part to diversions at Liddell Spring by the City of Santa Cruz. The proposed project would result in a significant cumulative effect to CRLF and steelhead habitat if the diversion at Plant Spring would increase, thereby altering stream habitat. Even an incremental increase could be considered cumulatively considerable. However, the proposed project in combination with the possible future mining of the 9.4-acre remaining area would simply extend the length of time mining occurs at the site, and the length of time water is diverted from the Plant Spring for dust control. Although the duration of the diversion would be lengthened with the proposed project and the potential 9.4-acre expansion area, no additional water would be diverted from Plant Spring at any given time. The diversion amount would continue to be minor, and when considered in combination with the 9.4-acre expansion area, would not result in a significant effect on flows in Liddell Creek. Therefore, mining of the proposed 17.1-acre Boundary Expansion Area with the addition to the 9.4-acre remaining area would not result in effects that are cumulatively considerable.

Coast live oak forest and northern coastal scrub are sensitive habitats that occur in the proposed Boundary Expansion Area as well as the 9.4-acre remainder area. The vegetative communities in these areas also provide wildlife habitat. The cumulative loss of these communities would be significant because they are protected by local policy. The significant effects of the proposed Boundary Expansion Area are mitigated through the 1996 Reclamation Plan Amendment as modified by Measure BIO-3. A similar program would also apply to the 9.4-acre remainder area if a future expansion was to occur. Coast live oak woodland and northern coastal scrub may also be preserved through mitigation imposed for impacts to SFDW

(Measures BIO-1 and BIO-2). With these measures the cumulative impacts to sensitive habitats and wildlife habitat would be less than significant.

6.4 MITIGATION MEASURES

The following measures will mitigate project impacts on biological resources. These measures would reduce the impacts to a less than significant level.

IMPACT: *The Limestone Quarry Boundary Expansion Project would impact SFDW populations within the Boundary Expansion Area through the loss of 17.1 acres of habitat and displacement/take of approximately 40 individual woodrats.*

Measure BIO-1: To mitigate the loss of SFDW habitat, a conservation easement shall be placed over suitable SFDW habitat at a ratio of 1:1 (one acre habitat preserved for one acre of habitat removed). The following steps shall be taken:

1. Prepare an assessment of SFDW habitat on three sites and identify the preferred site for the conservation easement. The three sites recommended for assessment are shown in Figures 36 and 37 and include: 1) APN 063-132-08, mixed evergreen forest and redwood forest in the buffer zone adjacent to the east side of the Boundary Expansion Area; 2) APN 063-121-07, coyote brush scrub located immediately north of the Boundary Expansion Area; and 3) APN 058-011-01, chaparral and knobcone pine vegetation near the San Vicente Quarry. The assessment shall include:
 - A map and description of vegetation communities, based on Holland 1986, Preliminary Description of the Terrestrial Natural Communities of California;
 - A map of the locations of SFDW houses, with GPS coordinates;
 - The number of houses per acre by mapped vegetation community;
 - An assessment of each house to determine if it is active or inactive, using observation techniques (unless trapping is required by CDFG);
 - A description of the tree and shrub species found within 25 feet of each house;
 - A description of the percent and type of ground cover immediately around each house;
 - A description of the building materials used for the house and an assessment as to whether similar materials remain in the area or the supply has been depleted;
 - A description of what the house is built on (e.g., ground, crotch of tree);
 - A description of enhancement measures that could be implemented to improve the quality of habitat for SFDW on the parcel; and
 - An assessment of connectivity of the SFDW habitat on the parcel to other similar habitat.
2. Collect additional data on habitat conditions and use in the Boundary Expansion Area. The purpose is two-fold: a) to determine whether the atypical redwood forest habitat is suitable for long-term use by SFDW and thus redwood forest can be used for the conservation easement; and b) to determine how many acres of SFDW habitat will require replacement at the 1:1 ratio (this is currently estimated to be 17.1 acres). Data shall include:
 - Collection and analysis of fecal samples from all SFDW houses in the proposed Boundary Expansion Area and from a random sample of SFDW houses in the northern portion of the 1,000 foot buffer area to the east of the project area. The purpose is to

determine whether the redwood forest vegetation community provides suitable foraging habitat in addition to other habitat requirements (e.g., breeding).

- If lab results from fecal analysis are ambiguous or inconclusive, the use of telemetry and tracking of selected animals shall be conducted for a period of 30 days to determine where SFDWs in the Boundary Expansion Area are foraging (i.e., what vegetation communities).
- If the data collected under No. 2 indicate that the redwood forest vegetation community provides suitable nesting and foraging habitat for SFDW, then preservation of redwood forest habitat in the adjacent buffer zone east of the Boundary Expansion Area (APN 063-132-08), or an alternate parcel with suitable habitat, is an acceptable measure to reduce the impacts to below a level of significance.
- If the data collected under No. 2 indicate that the redwood forest vegetation community does not provide suitable breeding and foraging habitat for SFDW, then a site containing coyote brush scrub, and/or northern coastal scrub, and/or coast live oak forest, and/or chaparral shall be used.

Implementation:	By CEMEX, through a qualified biologist.
Effectiveness:	Habitat set-asides would conserve suitable habitat acreage and provide for long-term habitat needs of SFDW in the project vicinity.
Feasibility:	Feasible. CEMEX has tentatively approved the location of the relocation site and habitat set-aside options.
Monitoring:	The results of the surveys shall be submitted to County Planning Department for review and approval prior to start of land clearing, and the selected conservation easement shall be established.

Measure BIO-2: In addition to Measure BIO-1, up to 40 SFDW shall be actively and passively relocated from the Boundary Expansion Area prior to land-clearing activities that will impact SFDW houses. Two potential relocation sites have been identified. The first relocation site is located immediately north of the Boundary Expansion Area on parcel 063-122-05. A second site is located northeast of the Boundary Expansion Area near the San Vicente Quarry (APN 058-011-01); a habitat evaluation of these sites will be provided under Measure BIO-1. Any remaining houses/animals shall be passively relocated.

The specific implementation methods for this mitigation measure shall be described in a SFDW Mitigation Plan. All relocation and tracking data collected under the SFDW Mitigation Plan shall be compiled into a report for submittal to CDFG and the County Planning Department. The SFDW Mitigation Plan shall at least include:

- Safety measures to avoid transmittal of Hantavirus and Arenavirus. Both the Hantavirus and Arenavirus are typically found in rodent populations and are shed in their saliva, urine, and feces. Humans can become infected after inhaling aerosolized droplets of urine or particulates contaminated with rodent excreta. Appropriate safety measures shall be taken including protection against inhalation of contaminated particulates, protection against particulates coming into contact with conjunctiva (eyes), and protection against fleabites. Those handling house materials should use appropriate respiratory, eye and skin protection (e.g., use of a hazardous materials suit).
- Data collection at each house to be dismantled (under either passive or active relocation) to identify house-building materials, contents of house cavities (particularly stored food

plants), the percent and type of ground cover immediately around each house, the tree and shrub species surrounding the house, and what the house is built on (e.g., ground, crotch of tree).

- Trapping method and length of time an animal can be held during house relocation
- New house design: for example, a wine barrel or similar receptacle staked into the ground, upside down and at an angle in appropriate microhabitat (based on data collected above and in Measure BIO-1), with materials from the nest chamber of the dismantled house placed inside, and other house materials placed over and around the barrel, including a long tunnel-shaped entrance that leads only into the receptacle so that when released the SFDW can only enter the house and cannot exit except through the tunnel. Food and house building materials should be provided. Slash generated during land clearing activities within the Boundary Expansion Area could be spread throughout the mitigation site to provide additional house building materials.
- Releasing method (how the trapped SFDW is released into the new house)
- Tracking of the relocated animals with radio telemetry for a period of 30 days following their release to determine the success of the relocation effort.
- Methods of passive relocation, including whether animals are to be trapped and released locally prior to house dismantling, and what time of day passive relocation should occur.

Implementation: By CEMEX, through a qualified biologist.

Effectiveness: Dismantling houses and relocating impacted animals prior to land clearing increases the potential for survival of directly impacted individual SFDW.

Feasibility: Feasible. Similar studies have occurred in the SFDW range with oversight by CDFG.

Monitoring: The Mitigation Plan shall be submitted to County Planning Department for review and approval prior to start of land clearing. The results shall be submitted to CDFG and the County Planning Department

IMPACT: *The 1996 Reclamation Plan Amendment would eliminate the 1:1 replacement requirement of all habitat types previously impacted in favor of vegetation communities that can be more easily re-established in reclaimed quarry areas. Replacement of maritime chaparral, needlegrass grassland, and diverse native grassland would not occur, and test plots would not be continued. This does not reflect current knowledge and would result in the permanent loss of sensitive habitats. The 1996 Reclamation Plan Amendment does not replace the 0.9 acres of coast live oak forest occurring in the Boundary Expansion Area that would be removed by the project.*

Measure BIO-3: Revise the proposed 1996 Reclamation Plan Amendment to incorporate sensitive habitats, a test plot system and to update the vegetation maps. This can be accomplished by incorporating the approach provided in the “2005 Alternative Revegetation Plan”, referenced as Appendix D. The “Mitigated 1996 Reclamation Plan Amendment” shall also include 0.9 acre of coast live oak forest, and a suitable mix of hydrophytic (growing wholly or partially in water) vegetation species to revegetate a portion of the quarry floor in accordance with Part 7 of Measure HYD-1. A suitable mix of hydrophytic species for a seasonal wetland may include such species as rush (*Juncus* spp.), bulrush (*Scirpus* spp.), sedge (*Carex* spp.), etc. The revised revegetation plan shall be developed by CEMEX in cooperation with a qualified

revegetation specialist for approval by County Planning prior to public hearing of the project proposal.

Implementation:	by CEMEX
Effectiveness:	This measure would restore sensitive communities within areas impacted by mining. This mitigation measure will ensure a no net loss of sensitive habitat from the GP/LCP Area as a result of quarry activities.
Feasibility:	Feasible.
Monitoring:	Amended 1996 Reclamation Plan submitted to the County for review and approval.

IMPACT: *The removal of 17.1 acres of forest and shrub-dominated upland habitat has the potential to impact or disturb nesting raptor and migratory bird species that may establish nests within the Boundary Expansion Area, resulting in a violation of state code and the MBTA.*

Measure BIO-4: Tree removal or land clearing that removes nesting habitat shall be conducted outside of the breeding season (February 15 to August 15) for raptors and migratory birds. Alternatively, the mining Boundary Expansion Area shall be surveyed for nesting birds by a qualified biologist using established CDFG protocols no more than 30 days prior to tree removal or land clearing, if these activities are to occur during the breeding season. If nesting birds are detected within the construction zone, methods of avoiding active nest sites (e.g., establishment of a buffer area around the active nest until hatchlings have fledged) shall be developed in coordination with CDFG. Surveys should be completed between February 15 and August 15 of any given year.

Implementation:	by CEMEX
Effectiveness:	Conducting tree removal and land clearing activities outside of the breeding season will avoid impacts to nesting birds. If tree removal or land clearing activities are to occur during the breeding season, pre-construction surveys would decrease the potential for adverse impacts to regionally occurring nesting special-status raptors that are known to forage or nest in habitat types within the Expansion Area. Consultation with and recommendations provided by CDFG would ensure the minimization of potential impacts to nesting special-status raptors and non-game birds.
Feasibility:	Feasible. The spring and summertime restriction limits the amount of time left for clearing work, and may result in rushed work, or an extension of clearing into additional season(s).
Monitoring:	The tree removal and land-clearing schedule shall be provided to the County. If done, the survey report shall be submitted to CDFG and the County prior to the tree removal.

IMPACT: *Overburden removal and mining in the Boundary Expansion Area could increase sediment levels entering Liddell Spring and discharged downstream to Liddell Creek. The project could also reduce the quantity of water in Liddell Spring. Central coast steelhead habitat could be impacted by increased sediment loads in lower reaches of Liddell Creek, and decreased flows.*

Measure HYD-1: (See Chapter 5.0 Hydrology and Water Quality).

Implementation:	by CEMEX
Effectiveness:	Implementation of the drainage plan provisions would control runoff in the expanded mining area, reduce runoff exposure to sediment sources, reduce exposure of rock fissures and voids to runoff containing sediment, and remove sediment from runoff entering the ground water through the quarry floor. These measures would reduce the turbidity impacts on Liddell Spring and sedimentation of downstream drainages protecting fish habitat.
Feasibility:	Feasible. Movable plastic membranes can be used to line benches and collect runoff in areas not being actively mined. The runoff so collected can be conveyed to the quarry floor by temporary down-drains. The efficacy of placing a compacted fine-grained cover on the quarry floor was previously disputed (SECOR, December 1998; EMKO, August 1999). However, given proper engineering consideration, a suitable sediment filter could be designed and installed as a basal layer of the planned fill placement in the base of the quarry. The filter would have to prevent migration or collapse of fill into solution channels or voids, but should maintain some permeability to allow ponded runoff to percolate.
Monitoring:	Drainage plan shall be submitted to County for review and approval prior to commencement of project.

IMPACT: *The Revegetation Plan component of the proposed 1996 Reclamation Plan Amendment does not provide adequate performance standards that meet the standards provided in Section 16.54.055 of the County Code.*

Measure BIO-5: Performance Standards for Revegetation:

1. Revegetation shall be part of the approved Reclamation Plan, unless it is not consistent with the approved end use. A native species vegetative cover suitable for the proposed end use and capable of self-regeneration without continued dependence on irrigation, soil amendments or fertilizer shall be established on disturbed land (including roads, ponds, streambeds, and other areas used in the mining operation) unless introduced species are consistent with the approved Reclamation Plan or unless native species prove infeasible. Vegetative cover or density, and species-richness shall be, where appropriate, sufficient to stabilize the surface against effects of long-term erosion and shall be similar to naturally occurring habitats in the surrounding area. The vegetative density, cover and species richness of naturally occurring habitats shall be documented in baseline studies carried out prior to the initiation of mining activities. However, for areas that will not be reclaimed to prior conditions, the use of data from reference areas in lieu of baseline site data is permissible.
2. Test plots conducted simultaneously with mining shall be required to determine the most appropriate planting procedures to be followed to ensure successful implementation of the proposed revegetation plan. The Planning Director may waive the requirement to conduct test plots when the success of the proposed revegetation can be documented from

experience with similar species and conditions or by relying on competent professional advice based on experience with the species to be planted.

3. Where surface mining activities result in compaction of the soil, ripping, disking, or other means shall be used in areas to be revegetated to eliminate compaction and to establish a suitable root zone in preparation for planting. When it is not necessary to remove road base materials for revegetative purposes, the Planning Director may set a different standard pursuant to Subsection 16.54.055(b)(3).
4. Prior to closure, all access roads, haul roads, and other traffic routes to be reclaimed shall be stripped of any remaining road base materials, prepared in accordance with Subsection 16.54.055(f)(7), covered with suitable growth media or top soil, and revegetated.
5. Soil analysis shall be required to determine the presence or absence of elements essential for plant growth and to determine those soluble elements that may be toxic to plants, if the soil has been chemically altered or if the growth media consists of other than the native topsoil. If soil analysis suggests that fertility levels or soil constituents are inadequate to successfully implement the revegetation program, fertilizer or other soil amendments may be incorporated into the soil. When native plant materials are used, preference shall be given to slow-release fertilizers, including mineral and organic materials that mimic natural sources, and shall be added in amounts similar to those found in reference soils under natural vegetation of the type being reclaimed.
6. Temporary access for exploration or other short-term uses on arid lands shall not disrupt the soil surface except where necessary to gain safe access. Barriers shall be installed when necessary to prevent unauthorized vehicular traffic from interfering with the reclamation of temporary access routes.
7. Native species shall be used for revegetation, except when introduced species are consistent with the approved Reclamation Plan or native species prove infeasible. Areas to be developed for industrial, commercial, or residential use shall be revegetated for the interim period, as necessary, to control erosion. In this circumstance, non-native plant species may be used if they are not noxious weeds and if they are species known not to displace native species in the area.
8. Planting shall be conducted during the most favorable period of the year for plant establishment.
9. Soil stabilizing practices shall be used where necessary to control erosion and for successful plant establishment. Irrigation may be used when necessary to establish vegetation.
10. If irrigation is used, the operator must demonstrate that the vegetation has been self-sustaining without irrigation for a minimum of two years prior to release of the financial assurances by the Planning Director, unless an artificially maintained landscape is consistent with the end use.
11. Noxious weeds shall be managed: (i) When they threaten the success of the proposed revegetation; (ii) To prevent spreading to nearby areas; and (iii) To eliminate fire hazard.

12. If recommended by the botanist, horticulturist or plant ecologist, plants and seed shall be propagated from sources on the site. If purchased, seed should be from a local source. A local source is defined as being as close as possible to the same geographic location or watershed, elevation, aspect, and soil type as the project.
13. The revegetation plan shall provide for re-establishing or enhancing any rare and endangered, or locally unique plant communities disturbed by any mining operation.
14. Success of revegetation shall be judged based upon the effectiveness of the vegetation for the approved end use, and by comparing the quantified measures of vegetative cover, density, and species-richness of the reclaimed mined lands to similar parameters of naturally occurring vegetation in the area. Either baseline data or data from nearby reference areas may be used as the standard for comparison. Quantitative standards for success and the location(s) of the reference area(s) shall be set forth in the approved Reclamation Plan. Comparisons shall be made until performance standards are met provided that, during the last two years, there has been no human intervention, including, for example, irrigation, fertilization, or weeding. Standards for success shall be based on expected local recovery rates. Valid sampling techniques for measuring success shall be specified in the approved reclamation plan. Sample sizes must be sufficient to produce at least an 80 percent confidence level. Standard statistical methods in commonly available literature may be utilized for determining an 80 percent confidence level on a site-by-site basis. Examples of such literature include (without limitation) D. Mueller-Dombois and H. Ellenberg, 1978 "Aims and Methods of Vegetation Ecology," John Wiley & Sons, Inc., or D.D. Bonham 1988 "Measurement for Terrestrial Vegetation."
15. Protection measures, such as fencing of revegetated areas and/or the placement of cages over individual plants shall be used in areas where grazing, trampling, herbivory, or other causes threaten the success of the proposed revegetation. Fencing shall be maintained until revegetation efforts are successfully completed.

Implementation: by CEMEX

Effectiveness: The performance standards provided in Section 16.54.055 of the County Code are designed to provide for successful site reclamation if properly implemented. Annual reporting and site inspections will ensure implementation.

Feasibility: Feasible.

Monitoring: The revised performance standards will be incorporated into the revised revegetation plan to be included in the proposed 1996 Reclamation Plan Amendment. The revised revegetation plan will be reviewed and approved by the County Planning Department prior to public hearing of the project proposal (see Measure BIO-3). Annual monitoring reports will be submitted to the County Planning Department to determine success of revegetation efforts.

IMPACT: *The proposed 1996 Reclamation Plan Amendment does not provide required detail governing the management or use of the stockpile resource in conflict with Mining Regulations 16.54.055 Performance Standards for Topsoil Salvage, Maintenance, and Redistribution.*

Measure BIO-6: The 1996 Reclamation Plan Amendment shall be revised in conformance with Mining Regulations 16.54.055(h) Performance Standards for Topsoil Salvage, Maintenance, and Redistribution.

1. All salvageable topsoil suitable for revegetation shall be removed as a separate layer from areas to be disturbed by mining operations. Topsoil and vegetation removal shall not precede surface mining activities by more than one year, unless a longer time period is approved by the Planning Director.
2. Topsoil resources shall be mapped prior to stripping and the location of topsoil stockpiles shall be shown on a map in the Reclamation Plan. If the amount of topsoil needed to cover all surfaces to be revegetated is not available on site, other suitable material capable of sustaining vegetation (such as subsoil) shall be removed as a separate layer for use as a suitable growth media. Topsoil and suitable growth media shall be maintained in separate stockpiles. Test plots may be required to determine the suitability of growth media for revegetation purposes.
3. Soil salvage operations and phases of reclamation shall be carried out in accordance with a schedule that: (i) is set forth in the approved Reclamation Plan; (ii) minimizes the area disturbed; and (iii) is designed to achieve maximum revegetation success allowable under the mining plan.
4. Topsoil and suitable growth media shall be used to phase reclamation as soon as can be accommodated by the mining schedule presented in the approved reclamation plan following the mining of an area. Topsoil and suitable growth media that cannot be utilized immediately for reclamation shall be stockpiled in an area where it will not be disturbed until needed for reclamation. Topsoil and suitable growth media stockpiles shall be clearly identified to distinguish them from mine waste dumps. Topsoil and suitable growth media stockpiles shall be planted with a vegetative cover or shall be protected by other equally effective measures to prevent water and wind erosion and to discourage weeds. Relocation of topsoil or suitable growth media stockpiles for purposes other than reclamation shall require prior written approval from the Planning Director.
5. Topsoil and suitable growth media shall be redistributed in a manner that results in a stable, uniform thickness consistent with the approved end use, site configuration, and drainage patterns.

Implementation: by CEMEX

Effectiveness: Salvage and protection of topsoil and growth media for future use in revegetation will greatly improve the planting success for species requiring more developed soil conditions. Protection of topsoil stockpiles ensures its availability for use when needed for the revegetation program.

Feasibility: Feasible. Stockpiles can be protected from erosion and weeds by establishing a vegetative cover or through tarping with plastic sheets.

Monitoring: Revision to the Reclamation Plan shall be submitted to the County for review and approval by planning staff prior to project commencement.