Figure 4 illustrates the areas of high, medium, and low biological value and sensitive species distribution as defined within the Central-Coastal Subregion NCCP/HCP that occur within the BGR. More recently, Chambers Group (2006) and Dudek (2005a, 2005c) have conducted sensitive plant and wildlife surveys within the BGR. Figure 5 displays the recorded observations from 2004, 2005, and 2007 surveys within the BGR. Resources and manuals used in the field evaluations include Cal-IPC (2006), CDFG (2003), the California Fish and Game Code, the federal Clean Water Act, McAuley (1996), Munz (1974), and Wachtell (1974).

The BGR is within a designated habitat linkage of the Central-Coastal Subregion NCCP/HCP Reserve system. Figure 3 illustrates the Reserve System. Coyote Canyon extends northward from Buck Gully providing linkage to a narrow southeast-northwest corridor through the San Joaquin foothills that links Upper Newport Bay and the main body of the Coastal Reserve. Upper Buck Gully is connected to Crystal Cove State park and the main body of the Coastal Reserve via the Pelican Hill Golf Course Special Linkage Area that extends to the southeast. Permitted uses within the Reserve System include necessary public and quasi-public infrastructure facilities and related operation and maintenance activities (County of Orange 1996). Storm drains and flood control facilities are listed among those public infrastructure facilities necessary for public health and safety (County of Orange 1996).

Local jurisdictions contribute to the management of the Reserve system by adopting General Plan, zoning, fuel modification, and other ordinances consistent with the Central-Coastal Subregion NCCP/HCP, reviewing project proposals in cooperation with the Reserve owner/manager to assure consistency with the Central-Coastal Subregion NCCP/HCP, verifying that mitigation fees are collected, recording CSS losses and mitigation, and ensuring that minimization and mitigation measures are enforced (County of Orange 1996).

The Central-Coastal Subregion NCCP/HCP allowed take authorization for (i.e., impacts to) CSS within the Reserve System and provided impact minimization policies. At the time the Central-Coastal Subregion NCCP/HCP was adopted, Buck Gully was owned by TIC. In 1999, ownership of Buck Gully was transferred to the County of Orange. Incidental take permits for the loss of a total of 512 acres of CSS habitat within the Reserve System were allocated by the Central-Coastal NCCP/HCP, including 30 acres to the County. In July 2005, ownership of Buck Gully in the Coastal Reserve was transferred from the County to the City of Newport Beach. The County retained its take allocation for infrastructure-related projects when it transferred ownership of Buck Gully for future anticipated projects. Although the City was a signatory to the Central-Coastal Subregion NCCP/HCP, there is limited acreage of CSS habitat within City-managed lands and consequently the City received no authorization for take of CSS habitat within BGR.

1.3.7 Central Orange County Integrated Regional and Coastal Watershed Management Plan

In August 2007, the County published Phase I of the Central Orange County Integrated Regional and Coastal Watershed Management Plan (IRCWMP). The IRCWMP was a collaborative effort by several local and regional agencies (twelve cities, seven water and wastewater agencies, and the County) to significantly improve water quality throughout Orange County's watershed areas. The plan identified 13 projects that will meet the goal of significantly improving water quality in streams and channels, particularly those that are listed as impaired and discharging to Upper Newport Bay (CCA 69), Lower Newport Bay, Newport Beach Marine Life Refuge (CCA 70/ASBS 32) and Irvine Coast Marine Life Refuge (CCA 71/ASBS 33). The Central Orange County IRCWMP encompasses the Newport Bay and Newport Coast Watersheds, a highly urbanized area with challenging issues related to water quality and protection of coastal resources and habitat. There are five total maximum daily loads (TMDLs), as established by the RWQCB, for the Newport Bay Watershed with more pending. The projects identified by the IRCWMP Group members collectively meet the objectives of the IRCWMP for water quality/pollution reduction, habitat and ecosystem restoration, and local water supply enhancement, among others. Goals of the Central Orange County IRCWMP include:

- Improve water quality in streams and channels discharging to Upper and Lower Newport Bay, Newport Beach Marine Life Refuge, and Irvine Coast Marine Life Refuge to reduce impacts on CCAs and Areas of Special Biological Significance (ASBSs)
- Provide for implementation of restoration projects, best management practices (BMPs), and other control measures to support beneficial uses of creeks, streams, bays and estuaries, and facilitate attainment of TMDL targets, receiving water quality objectives and RWQCB's National Pollutant Discharge Elimination System (NPDES) permit requirements
- Provide a comprehensive, regional, watershed-wide approach to address runoff and its related impacts from existing and future land uses, in accordance with the Non-point Source Pollution Plan
- Protect, restore, enhance and connect habitats and support ecosystem processes, while maintaining flood protection
- Enhance quantity and quality of local water supplies
- Provide a safe, reliable drinking water supply and recreational opportunities for disadvantaged communities

- Provide a framework for efficient intra-regional cooperation, planning, and implementation of this and other plans that have been developed for the region.

Specifically, the project for Buck Gully and Morning Canyon was designed to reduce sediment loads, improve water quality, and reduce erosion within Buck Gully and Morning Canyons through the construction of a wetland treatment system, grade control structures, and bank stabilization. These facilities within Buck Gully have been sited just south of the BGR. The project will:

- Reduce impact to the canyon creeks, water quality, habitat, and bank stabilization (hydromodification) through the implementation of grade controls, bank stabilization, and wetland treatment system
- Reduce the potential for downstream impacts to the ASBS
- Control erosion to reduce the loads of sediment entering the ASBS by treating flows prior to entry into the marine environment
- Improve habitat through the removal of invasive plants and restoration of wetland habitat.

In November 2007 the City of Newport Beach began Phase II of the watershed planning effort. The Phase II Central Orange County IRCWMP builds on the Phase I Plan and expands the scope quite significantly to include all ecological resources within the Watershed and Coastal Area and to integrate the water management activities within the watershed to create a coordinated approach among all water managers whose efforts affect each other. This planning effort is more comprehensive and includes over 200 projects. The Phase II IRCWMP is still in preparation but has the purpose of ensuring that public and private lands in the Central Orange County Water Management Area are managed holistically and fiscally responsible to sustain healthy ecosystems, protect critical habitat and species, and allow the community to enjoy its connection with nature, while at the same time safeguarding the health and welfare of the community, maintaining immediate and long-term reliability of water supplies, and protecting the value of property. Additional projects within Buck Gully and Morning Canyon are anticipated to ensure the goals of the IRCWMP are accomplished.

1.4 RRMP Public Participation Process

Several trail users were interviewed by IRC in October 2008 about their use of and interest in the Buck Gully trails in order to help inform decisions on further trail modifications. In addition, two public meeting were held on May 6, 2009, at the Newport Coast Community Center and May 12, 2009, at the Newport Beach Public Library to introduce and solicit feedback on the management goals and strategies of the RRMP.

1.5 RRMP Review and Approval Process

The BGR RRMP was submitted for review and comment to the City. The document will be submitted for final approval by the CDFG and USFWS.

1.6 RRMP Updates and Amendments

City Staff and/or their land manager (if any) will review the BGR RRMP annually to determine whether updates/amendments are warranted.

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2.0 RESERVE EXISTING CONDITIONS

2.1 Visual Resources

The topographic setting and natural features of the San Joaquin Hills and Buck Gully offer several unique views of the Pacific Ocean. The San Joaquin Hills are separated from the present shoreline by a relatively flat, narrow shelf (City of Newport Beach 2005). Originally formed by wave abrasion, the relatively flat coastal terrace is elevated more than 90 feet above the shoreline. Buck Gully is one of three significant canyons formed by the erosional forces of water along Newport Coast that is characterized by steep slopes and CSS vegetation, which provide distinctive natural features.

Although there is extensive residential development surrounding Buck Gully, the presence of low-rise buildings and wide, landscaped roadways preserve views of the City. North- and south-oriented surface streets provide spectacular open vistas of the coast that characterize residential communities of the area. One significant vista identified in the City's LCP that occurs along the northern boundary of the BGR is the public segment of San Joaquin Hills Road from Newport Ridge Drive to Spyglass Hill Road. Two view parks have been created along San Joaquin Hills Road specifically to take advantage of the significant view.

2.2 Physical Setting

2.2.1 Topography

Buck Gully is characterized by a relatively narrow floodplain zone bordering Buck Gully Creek on either side, with moderately steep slopes to the north and south. Elevation within the BGR ranges from 100 feet above mean sea level (AMSL) at its western-most extent, near the intersection of 5th Avenue and Poppy Avenue, to approximately 600 feet AMSL in the eastern and south-eastern portions of the BGR. Slopes within the BGR vary by location. Some areas, such as those along the northern BGR boundary adjacent to Buck Gully Drive present nearly flat slopes. More narrow sections of the BGR exhibit steeper slopes, exceeding 50%, while the remaining slopes within the BGR average between 20 and 35%. Slope aspect varies significantly throughout the BGR, directly affecting vegetation composition and local drainage patterns.

2.2.2 Geology and Soils

The Newport Coast is generally underlain by marine shale (Monterey Formation), poorly consolidated sandstone (Capistrano Formation), and volcanic rocks that occur over terrace deposits and thin, narrow alluvial deposits (Todd Engineers and Rivertech 2006). The portion of the San Joaquin Hills within the BGR includes tertiary sedimentary rocks (Paleocene through

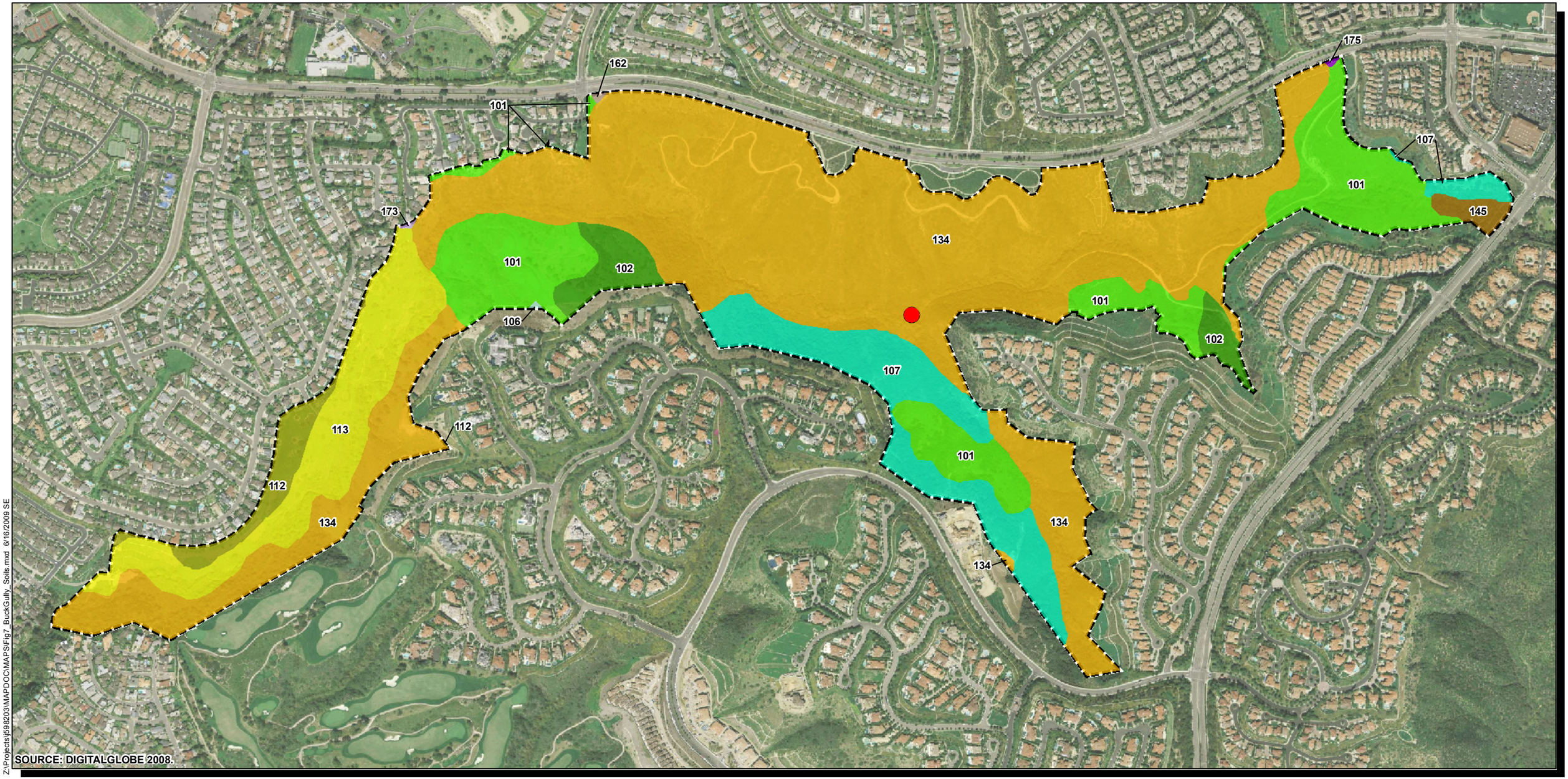
early-middle Miocene) with both marine and non-marine origins. The sedimentary rocks include late-middle Miocene igneous andesites and diabases intrusions that are capped by Pleistocene and Holocene surficial deposits (Todd Engineers and Rivertech 2006).

The present topography and geomorphology of the BGR are a direct result of historic faulting and regional uplift of the San Joaquin Hills. Numerous inactive faults are located within the immediate region of the BGR, including Pelican Hill, Laguna Canyon, and Shady Canyon Faults (Todd Engineers and Rivertech 2006). The nearest active fault is the Newport-Inglewood fault, which lies approximately 6 miles to the southwest.

Surface soils include non-marine terrace deposits, alluvium, colluvium, and landslide deposits. Three soil types are mapped within the project area: Balcom clay loam, 15% to 30% slopes, which occur along the northern edge of the BGR; Balcom clay loam, 30% to 50% slopes, which occur in the center and adjacent to Buck Gully Creek; and Calleguas clay loam, 50% to 75% slopes, which occur in the southern and northern portions of the BGR (Wachtell 1978). Both Balcom and Calleguas series soils are well-drained upland soils formed from sedimentary parent material. Balcom soils are derived from weathered sandstone, shale and marl and are up to three feet deep, while Calleguas soils are derived from lime coated sandstone or shale and are only about 15 inches deep (Wachtell 1978). Figure 7 illustrates the soil mapping units present within the BGR.

2.2.3 Climate

The climate in the BGR area is Mediterranean, characterized by warm, dry summers and wetter winters. Precipitation typically occurs between December and March. The prevailing wind is an onshore flow with offshore, fall Santa Ana winds from the northeast that may gust to 50 miles per hour or higher inland from this location. Because the BGR is adjacent to the Pacific Ocean, it typically exhibits higher humidity and subsequently higher vegetation moisture content than would be found inland. From a fire hazard perspective, the local climate contributes significantly to fire risk as drying vegetation (lower fuel moisture) during the summer months becomes fuel available to advancing flames should an ignition be realized.



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Sampling Site (approx.)*

Buck Gully Boundary

** Todd Engineers/Rivertech (2006) Seepage/Surface Water Sampling Site Location (approx.)*

Soil Types

- 101 = ALO CLAY, 15%-30% SLOPES
- 102 = ALO CLAY, 30%-50% SLOPES
- 106 = ANAHEIM LOAM, 15%-30% SLOPES
- 107 = ANAHEIM LOAM, 30%-50% SLOPES
- 112 = BALCOM CLAY LOAM, 15%-30% SLOPES
- 113 = BALCOM CLAY LOAM, 30%-50% SLOPES
- 134 = CALLEGUAS CLAY LOAM, 50%-75% SLOPES, ERODED
- 145 = CIENEBA-ROCK OUTCROP COMPLEX, 30%-75% SLOPES
- 162 = MARINA LOAMY SAND, 2%-9% SLOPES
- 173 = MYFORD SANDY LOAM, 2%-9% SLOPES
- 175 = MYFORD SANDY LOAM, 9%-15% SLOPES

DUDEK

0 700 1,400 Feet

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Buck Gully Reserve - Resource & Recreation Management Plan

Soils Map

FIGURE 7

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2.2.4 Hydrology

Buck Gully occurs within the Santa Ana River Hydrologic Unit (HU 801.0), Lower Santa Ana River Hydrologic Area (HA 801.1), and more specifically, the East Coastal Plan Hydrologic Sub-Area (HSA 801.11). The East Coastal Plan HSA encompasses approximately 302 square miles and includes the Newport Bay (154 square miles) and Newport Coast (11 square miles) Watersheds. Buck Gully is one of nine small coastal channels that occur within the Newport Coast Watershed. Buck Gully's contributing watershed encompasses approximately 1,249 acres.

Buck Gully Creek is characterized by a steep, earthen channel that supports segments of perennial and intermittent surface water flows. Primary sources of water include rainfall and runoff from surrounding lands. Historic topographic maps indicate that Buck Gully was an ephemeral drainage that only supported flow following rainfall periods, and did not contain perennial reaches or springs (Todd Engineers and Rivertech 2006). However, construction of residential and recreational development surrounding the headwater system and adjacent banks, and the presence of several concrete storm drain outlets currently provides supplemental surface water to Buck Gully. Surface water flow data from the *Newport Coast Flow and Water Quality Assessment* (Weston Solutions 2007) during both the wet and dry seasons are shown in Table 1.

Table 1
Buck Gully Creek Flow Data

Station ID	Description	Wet Season Unit Modeled Flow (cfs)	Dry Season Unit Modeled Flow (cfs)
BG3	In-stream at Poppy and 5th Avenue	1.03	0.37
BG4	Downstream of Spyglass Ridge Community outfall	0.89	0.32
BG5	Upstream of San Joaquin Hills Road outfall at end of walking path	0.69	0.25
BG6	Downstream of corrugated pipe outfall on fire road	0.46	0.17
BG7	Downstream of Newport Coast Road and first MS4 outfall	0.29	0.10

Source: Weston Solutions 2007.

The surface water flows are a result of increased impervious surfaces, introduction of invasive/exotic vegetation, and greater number of sources of supplemental hydrology into the canyon. The lower portion of the steep canyon creek channel has been subject to severe erosion as a result of increased and sustained peak surface water flows (Dudek 2007).

The Water Quality Control Plan for the Santa Ana Region (8) ("Basin Plan") (RWQCB 2008) was consulted to determine the beneficial uses for the BGR's surface water resources. Table 3-1, Beneficial Uses of Inland Surface Waters, within the Basin Plan identified four existing beneficial uses and one potential beneficial use. Existing beneficial uses are designated in the

Basin Plan for the reservoirs, bays, estuaries and tidal prisms, watershed streams, and wetlands within the Newport Bay/San Diego Creek Watershed. For the Newport Coast Watershed, only the near-shore zone of the ocean waters have designated beneficial uses. According to the Central Orange County IRCWMP (Dudek 2007), the following beneficial uses apply for Buck Gully:

- AGR – Agricultural supply waters are used for farming, horticulture, or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
- GWR – Groundwater recharge waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality, or halting saltwater intrusion into freshwater aquifers.
- WARM – Warm freshwater habitat waters support warm-water ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
- LWRM – Limited warm freshwater habitat waters support warm-water ecosystems that are severely limited in diversity and abundance as the result of concrete-lined watercourses and low, shallow dry weather flows that result in extreme temperature, pH, and/or dissolved oxygen conditions. Naturally reproducing finfish populations are not expected to occur in LWRM waters.

Additionally, groundwater occurs at relatively shallow depths within thin and discontinuous alluvial deposits along the major drainages of the Newport Coast watershed (Todd Engineers and Rivertech 2006). A groundwater pumping experiment in Buck Gully in 1999 indicated that groundwater exfiltration provides a significant amount of water to dry-weather flows in the canyon (City of Newport Beach 2007). A more recent Todd Engineers and Rivertech groundwater seepage study (2006) identified sources, quantities, and quality of groundwater within Buck Gully. Results of that study identified residential irrigation as the major contributor to groundwater recharge, which was supplemented by pipeline leakage and golf course irrigation. Additionally, the study found that recharge from landscape and golf course irrigation within the Morning Canyon/Pelican Point watersheds have caused groundwater mounding and groundwater seepage into lower Buck Gully (Todd Engineering and Rivertech 2006). Further, a groundwater seepage sampling site located in upper Buck Gully (approximate location presented in Figure 7) was characterized by reliable flow, likely reflecting the influence of local geologic conditions (Todd Engineering and Rivertech 2006).

2.3 Biological Resources

This section contains the general biological resources of the BGR in terms of plant communities, floral diversity, wildlife diversity, wildlife corridors, and sensitive biological resources occurring on site as well as their potential to occur.

2.3.1 Vegetation Communities

Based on species composition and general physiognomy, 19 vegetation communities are present within the study area and 4 land covers are present on site. General plant communities include upland grassland, coastal scrub, chaparral scrub, upland woodland, and riparian. Nine sub-associations of the Venturan-Diegan transitional coastal scrub, as defined by Gray and Bramlet (1992), were identified within the study area: California buckwheat sage scrub (CBSS), coastal sage California buckwheat scrub (CSCB), coastal sage monkeyflower scrub (CSMF), coastal sage scrub (CSS), coastal sage scrub/grass (CSS/GRASS), coyote brush scrub (CBS), sagebrush coyote brush (SBCB), sage scrub grassland (SSG), and southern cactus scrub (SCS). These vegetation communities are generally the same as in the Central-Coastal NCCP/HCP EIR/EIS database, but with some adjustments to rectify polygon shapes and sizes. Three upland grasslands were identified within the study area: annual grassland (AGL), southern coastal needlegrass grassland (NGL), and wild rye (WR). Three chaparral communities were identified within the study area: southern mixed chaparral (SMC), scrub oak chaparral (SOC), and toyon sumac chaparral (TSC). Two riparian communities were identified within the study area: southern willow scrub (SWS) and sycamore riparian woodland (SRW). The upland woodland communities found within the study area include Mexican elderberry woodland (MEW) and disturbed Mexican elderberry woodland (dMEW). Land covers present on site include ornamental (ORN), ruderal (RUD), developed land (DEV), and disturbed habitat (DIS). Detailed descriptions of the vegetation communities and land covers are provided below, acreages are provided in Table 2, and a map depicting their distribution within the study area is provided in Exhibit A. Representative on-site photographs of vegetation communities are provided in Figures 8 and 9.

Table 2
Vegetation Communities and Land Covers

Vegetation Community/Land Cover	Acres
Upland Grassland	
Annual Grassland	10.9
Southern coastal needlegrass grassland	0.4
Wild Rye	0.3

Table 2 (Continued)

Vegetation Community/Land Cover	Acres
Coastal Scrub	
California Buckwheat Sage Scrub	2.4
Coastal Sage California Buckwheat Scrub	122.6
Coastal Sage Monkeyflower Scrub	2.1
Coastal Sage Scrub	4.7
Coastal Sage Scrub/Grass	0.7
Coyote Brush Scrub	0.9
Sagebrush Coyote Bush	12.3
Sage Scrub Grassland	0.8
Southern Cactus Scrub	0.2
Chaparral Scrub	
Southern Mixed Chaparral	42.1
Scrub Oak Chaparral	2.8
Toyon Sumac Chaparral	28.5
Upland Woodland	
Disturbed Mexican Elderberry Woodland	1.5
Mexican Elderberry Woodland	9.1
Riparian Scrub	
Southern Willow Scrub	16.7
Riparian Forest Woodland	
Sycamore Riparian Woodland	1.3
Land Covers	
Developed Land	0.1
Disturbed Habitat	11.7
Ornamental	5.5
Ruderal	19.6
Total	297.2

Upland Grassland

Annual Grassland

Annual grassland is typically dominated by non-native grasses and occurs on gradual slopes with deep soils below 3,000 feet AMSL (Gray and Bramlet 1992). It may occur where disturbance by maintenance (mowing, scraping, discing, spraying, etc.), grazing, repetitive fire, agriculture, or other mechanical disruption have altered soils and removed native seed sources from areas formerly supporting native vegetation.

Photo 1: Annual grassland, ruderal, coastal sage scrub and southern willow scrub communities (western portion) looking southeast. (Spring 2007)

Photo 2: Ruderal, coastal sage scrub and southern willow scrub communities (western portion) looking northeast. (Spring 2007)

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Buck Gully Reserve – Resource & Recreation Management Plan

Site Photographs

FIGURE 8