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**RESTORATION “AS-BUILT” REPORT AND ADDENDUM  
TO  
CONCEPTUAL HABITAT RESTORATION AND  
REVEGETATION PLAN,  
2825 PADARO LANE, SUMMERLAND,  
SANTA BARBARA COUNTY, CALIFORNIA**



*Southern stream terrace, looking north. 22 May 2012.*

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**Restoration “As-Built” Report and Addendum to  
Conceptual Habitat Restoration and Revegetation Plan,  
2825 Padaro Lane, Summerland,  
Santa Barbara County, California**

**Introduction.** Installation of a series of cage gabions to form a structural foundation for habitat restoration on slopes in the southwest portion of the restoration area was the basis for Zoning Violation Case No. 11ZEV-00000-00011, dated 20 January 2011, which prompted County Planning & Development Department review of the entire “as-built” restoration effort. This addendum describes field changes that were made during implementation of an approved Conceptual Habitat Restoration and Revegetation Plan (dated 20 July 2009) for the subject property. The County of Santa Barbara Planning and Development Department approved this Plan in late summer 2009 (Approved Plan hereafter). Plan implementation began in November-December 2009 and is on-going. The restoration described herein was completed in May-June 2011 and monitoring of those portions of the Approved Plan began at that time. Monitoring of these and future plantings will occur for three (3) years post-planting to ensure that the restoration effort meets or exceeds performance criteria described in the Approved Plan.

**Executive Summary.** Field changes frequently occur when implementing habitat restoration plans to address altered site conditions and/or accommodate factors that could not be anticipated when the Plan was prepared. Table 1 compares: a) site conditions before restoration; b) the Approved Plan, and; c) “as built” field changes to the Approved Plan. The locations of these changes are shown in Figure 1 and are described in detail in following sections. “Before” and “after” restoration photos are included in Appendix 1. Lists of species and planting densities are included in Appendix 2.

**Table 1. Summary of Approved versus “As-Built” Restoration.**

Approved Restoration Goal or Action (p. 19 of Approved Plan)	Before Restoration	Approved Plan	“As-Built” Restoration	Difference
<b>Restoration of Existing Native Plant Communities:</b> <ul style="list-style-type: none"> <li>• Coast Live Oak-Sycamore Riparian Woodland and Riparian Scrub</li> <li>• Southern Coastal Bluff Scrub</li> <li>• Freshwater Marsh</li> <li>• Southern Foredune (Coastal Strand)</li> </ul> <p style="text-align: center;"><b>TOTAL</b></p>	<ul style="list-style-type: none"> <li>• 0.68 acres</li> <li>• 0.25 acres</li> <li>• 0.02 acres</li> <li>• 0.06 acres</li> </ul> <p style="text-align: center;"><b>1.01 acres</b></p>	<ul style="list-style-type: none"> <li>• 2.19 acres</li> <li>• 0.48 acres</li> <li>• 0.03 acres</li> <li>• 0.09 acres</li> </ul> <p style="text-align: center;"><b>1.78 acres</b></p>	<ul style="list-style-type: none"> <li>• 2.00 acres</li> <li>• 1.10 acres</li> <li>• 0.20 acres</li> <li>• 0.12 acres</li> </ul> <p style="text-align: center;"><b>3.42 acres</b></p>	<ul style="list-style-type: none"> <li>• - 0.19 acres (see discussion)</li> <li>• + 0.62 acres</li> <li>• + 0.17 acres</li> <li>• + 0.03 acres</li> </ul> <p style="text-align: center;"><b>Net gain of 0.63 acres</b></p>
<b>Plant Native Trees Along Western and Northern Property Boundaries</b>	No trees along western property boundary; myoporum hedge along northern	Remove myoporum hedge; plant 75 native trees along southern, western, and northern property	To be completed upon approval of Landscaping Plan	75 native trees will supplement 131 native trees already planted in Toro Canyon Creek corridor, for total of 206 trees, or a

	boundary	boundaries (Table 9)		11% increase over approved Plan
<b>Establish on-site food sources for monarch butterflies</b>	Marginal adult food source (blue gum); no larval food source plants on-site	One larval and one adult food source species (Tables 5 and 6 of approved Plan)	Two adult food source species  One larval food source species	Gain of one adult food source species and denser planting of adult food sources along terraces, blufftop, and top-of-bank
<b>Replace dead or dying eucalyptus with native trees</b>	0.64 acres of eucalyptus trees	Remove trees as per recommendations of certified arborist (Appendix 4 of approved Plan)	Removed 15 eucalyptus trees from restoration area and replaced with coast live oak, western sycamore, black cottonwood, white alder, and box elder trees at > 2:1 replacement ratio	No change from approved plan
<b>Create additional freshwater marsh habitat</b>	0.02 acres of degraded marsh habitat; erosion of terrace banks and floor and sedimentation of Toro Canyon Creek due to uncontrolled surface runoff	Create 0.03 acres by constructing a bioswale along edge of path down to southern stream terrace	Created or will create 0.21 acres through removal of non-native vegetation and planting of freshwater marsh species	Net gain of 0.18 acres of freshwater marsh habitat  Future revegetation of proposed drainage swales will create an additional 0.05 acres of marsh habitat
<b>Meet or exceed Approved Plan guidelines for habitat restoration plans</b>	1.00 acres of native habitat; 1.62 acres of ruderal vegetation; 0.56 acres of bare soil (Table 3 of Approved Plan)	Restore 3.18 acres to native habitat  Plant 235 native grasses, 995 native shrubs, and 130 native trees	Restored 3.42 acres to native habitat to date  Planted 3,605 native grasses, 2,179 native shrubs, and 131 native trees to date	Net gain of approx. 0.24 acres of native habitat over approved Plan  Exceeded planting density by 430% and species richness by 340% over Approved Plan

Non-native vegetation was removed from the subject reach of Toro Canyon Creek and adjacent stream terraces and banks, as per Section 6.4.1 and Table 4 in the Approved Plan.

**“As-Built” Changes to Approved Plan.** The following discussion is organized by items mapped sequentially on Fig. 1:

*Item 1. Changes to Size of Coast Live Oak-Western Sycamore Riparian Woodland Restoration.* The Approved Plan proposed to restore/enhance approximately 2.19 acres of oak-sycamore riparian woodland. Approximately 2.00 acres have been restored to

date. This 8% decrease occurred on the north and south terrace slopes that were originally proposed for oak-sycamore woodland restoration, but were more appropriately planted with coastal bluff scrub vegetation (Item 1 on Fig. 1). Photos 8-9, 17-18a,b, and 21-22 in Appendix 1 show before and after conditions in coast live oak woodland and oak-sycamore riparian woodland restoration sites.

*Item 2. Changes to Size of Southern Coastal Bluff Scrub Restoration.* The Approved Plan proposed to restore/enhance approximately 0.48 acres of coastal bluff scrub. Approximately 1.00 acres has been restored to date and approximately 0.10 additional acres will be added when restoration of the zoning violation items, specifically the gabion wall, has been completed (Item 2 on Fig. 1). This represents a 129% increase in area for this habitat type. Dead or diseased eucalyptus trees were removed per arborist recommendations from the slopes and floor of the southern stream terrace, which expanded the amount of area available for coastal bluff scrub restoration. Photos 1-4, 6-7, 12-16, and 19-22 in Appendix 1 show before and after conditions in coastal bluff scrub restoration sites.

*Item 3. Changes to Location and Area of Freshwater Marsh.* The Approved Plan proposed to restore/enhance approximately 0.03 acres of freshwater marsh. In total, about 0.21 acres of freshwater marsh habitat has been enhanced or will be created under the “As-Built” Plan.

*South Bioswale.* The Approved Plan proposed to restore/enhance approximately 0.03 acres of freshwater marsh, primarily by creating a bioswale in uplands west of Item 9 on Fig. 1. This feature would have conveyed surface runoff to Toro Canyon Creek from the western portions of the property to the top of the beach path. The owners have decided to retain the existing system in which runoff in the uplands is collected in an underground culvert and conveyed to an outfall at the top of the path. The culvert outfall will empty into a cobble-lined swale that will run along the south side of the path, across the terrace floor, and empty into the creek. This feature will create about 0.030 acres of freshwater marsh habitat and will eliminate a major source of sediment into the creek and lagoon when completed. Photos 13-14 and 23-24 show the current condition of the south bioswale, to be completed once permitted.

*North Bioswale.* Additional freshwater marsh habitat will be created through restoration of an erosion feature that formed on the north stream terrace after the original Plan was approved (Item 3 on north terrace in Fig. 1 and photo 27 in Appendix 1). Currently, surface flows from the southern half of the property sheet-flow across the uplands through erosion channels on the slope, floor, and stream banks of the north stream terrace floor, into Toro Canyon Creek. Restoration of this feature includes lining it with cobbles and planting freshwater marsh species, such as rushes, scouring rush, nut-grass, and other species, in the interstitial spaces between the cobbles. This will eliminate a major source of sediment input to Toro Canyon Creek and halt slope erosion that is threatening mature coast live oaks on the slopes of the north terrace. This feature will create approximately 0.042 acres of freshwater marsh habitat. Representatives from the U.S. Army Corps of Engineers, California Department of Fish and Game, and

California Coastal Commission all agree that this feature is appropriate for this location. Future bank restoration lateral to the outfall of the swale will create an additional 0.015 acres of freshwater marsh habitat on the western bank of Toro Canyon Creek (Item 3 on Fig. 1).

*Toro Canyon Creek Banks.* The amount of freshwater marsh habitat around the terminal lagoon and lower reaches of Toro Canyon Creek has been expanded by approximately 0.12 acres by removing and controlling non-native vegetation and allowing native yellow nut-grass, scouring rush, and cattails that were in adjacent areas to colonize these sites (photos 3-5 and 23-24 in Appendix 1 and Item 3 on Fig. 1).

*Item 4. Southern Foredune (Coastal Strand).* The Approved Plan proposed to restore/enhance approximately 0.09 acres of coastal strand habitat. Approximately 0.12 acres of strand habitat in the dunes around the mouth of Toro Canyon Creek have been restored to date by removing and controlling invasive, non-native vegetation. The Approved Plan called for hydroseed application of a seed mix to this area (Table 6 of Plan) however, one of the species included in the seed mix were already present here in good numbers (beachbur). Other native species occurring here include lemonadeberry and seacliff buckwheat. It was decided to forego hydroseeding in favor of creating conditions under which the existing native plant populations could spread into areas formerly covered by non-native vegetation. Container stock of seacliff buckwheat (*Eriogonum parvifolium*), giant rye, seaside daisy (*Erigeron glaucus*), and other strand species have been planted on an adjacent slope and along portions of the beach path. This increased coastal strand habitat by about 33% over the Approved Plan (Item 4 on Fig. 1). Photos 10-11, and 16 in Appendix 1 show portions of this vegetation.

*Item 5. Seed Mixes and Hydroseeding.* Tables 5, 6, and 7 and Section 6.4.2 of the Approved Plan called for various seed mixes to be applied by hydroseeding the banks and stream terraces of Toro Canyon Creek and the coastal bluff area (Item 5 on Fig. 1). Instead, the seed mixes for these areas were applied by hand and raked into the soil. Hydroseeding was not done for three reasons: a) the binder in hydroseeding makes it more difficult to remove non-native vegetation by hand; b) sowing seed by hand results in less damage to the container plants that had already been installed in these areas, and; c) sowing seed by hand avoided application of a water-based delivery system to the highly erosive soils on the terrace slopes. The seed mixes were sown just before the onset of the 2010/2011 rainy season and showed excellent germination rates. Additional seed will be sown as conditions warrant during the monitoring phase. Appendix 2 of this Addendum lists 19 native species planted as seed.

Table 2 provides the reasons why certain plant species listed in Tables 5, 6, and 7 in the Approved Plan were not used.

**Table 2. Field Changes to Hydroseed Species Lists in Tables 5, 6, and 7 in Approved Plan.\***

Scientific Name	Common Name	Hydroseed Location in Approved Plan	Reason for Not Using Species
<i>Eriogonum fasciculatum</i>	Coastal sagebrush	Banks and terraces of Toro Creek floodplain (Table 5)	Substituted seacliff buckwheat ( <i>E. parvifolium</i> );

			more appropriate to site
<i>Mimulus guttatus</i>	Common monkeyflower	Banks and terraces of Toro Creek floodplain (Table 5)	Substituted southern monkeyflower ( <i>M. longiflorus</i> ); more appropriate to site
<i>Hordeum brachyantherum</i> ssp. <i>brachyantherum</i>	Meadow barley	Banks and terraces of Toro Creek floodplain (Table 5)	Decided to concentrate on use of California brome ( <i>B. carinatus</i> ) and dune sedge ( <i>Carex praegracilis</i> )
<i>Muhlenbergia microsperma</i>	Small-seeded muhly	Banks and terraces of Toro Creek floodplain (Table 5)	Decided to concentrate on use of California brome ( <i>B. carinatus</i> ) and dune sedge ( <i>Carex praegracilis</i> )
<i>Atriplex californica</i>	California saltbush	Coastal bluff (Table 6)	Tends to dominate areas where planted; may use in future to fill in "holes" in vegetation along coastal bluff
<i>Baccharis pilularis</i>	Coyote bush	Coastal bluff (Table 6)	Tends to dominate areas where planted; already present in this area in low numbers
<i>Abronia maritima</i>	Sticky sand-verbena	Coastal strand (Table 7)	Could not find seed or container source close to subject property

\* see Appendix 2 for list of species installed as seed.

*Item 6. Changes to Shrub and Tree Palette and Planting Density.* The conceptual shrub and tree palettes in Tables 8 and 9 of the Approved Plan were modified to meet site-specific conditions. Reasons for not using particular species listed in these tables are described in Table 3.

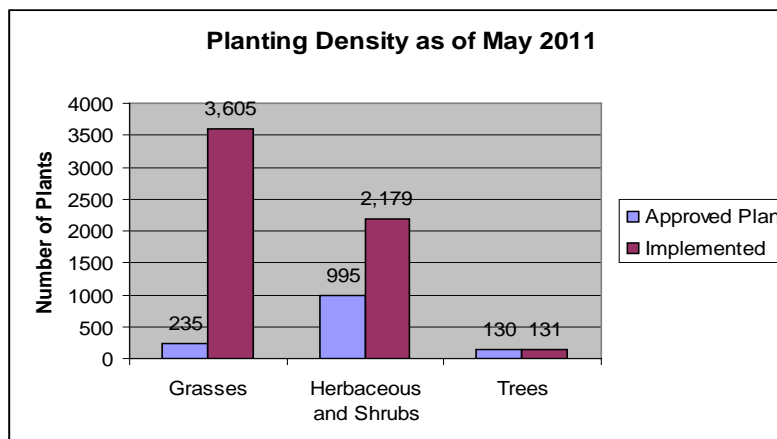
**Table 3. Field Changes to Shrub and Tree Species Lists in Tables 8 and 9 in Approved Plan.\***

Scientific Name	Common Name	Planting Location in Approved Plan	Reason for Not Using Species
<i>Ribes amarum</i>	Bitter gooseberry	Banks and terraces of Toro Creek floodplain (Table 8)	Substituted other species of <i>Ribes</i> (see Appendix 2) that were more appropriate to the site
<i>Scrophularia californica</i>	California bee plant	Banks and terraces of Toro Creek floodplain (Table 8)	Based on experience with this species in other restoration efforts, most plants do not persist after 2-3 yrs
<i>Mimulus guttatus</i>	Common monkeyflower	Banks and terraces of Toro Creek floodplain (Table 8)	Substituted southern monkeyflower ( <i>M. longiflorus</i> ); more appropriate to site
<i>Artemisia douglasiana</i>	Mugwort	Banks and terraces of Toro Creek floodplain (Table 8)	Already present and spreading on-site
<i>Solanum douglasii</i>	Douglas' nightshade	Banks and terraces of Toro Creek floodplain (Table 8)	Already present and spreading on-site
<i>Muhlenbergia rigens</i>	Deer grass	Banks and terraces of Toro Creek floodplain (Table 8)	Decided to concentrate on use of California brome ( <i>B. carinatus</i> ) and dune sedge ( <i>Carex praegracilis</i> )
<i>Nassella</i> sp.	Needlegrass	Banks and terraces of Toro Creek floodplain (Table 8)	Decided to concentrate on use of California brome ( <i>B. carinatus</i> ) and dune sedge ( <i>Carex praegracilis</i> )
<i>Umbellularia californica</i>	California bay	Stream terraces	Prone to fungal diseases;

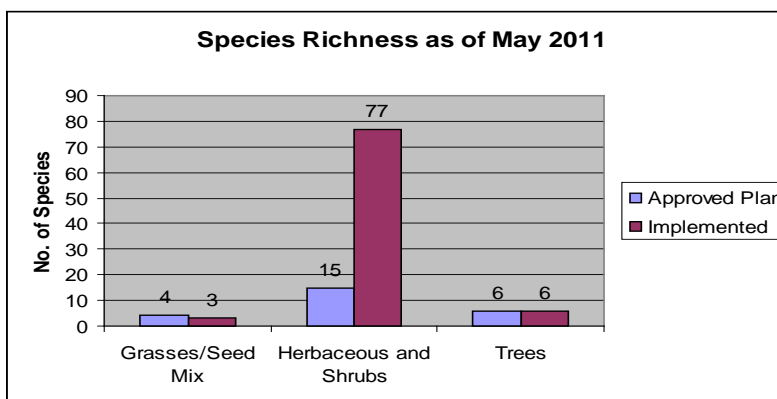
			planted additional sycamores and coast live oaks to compensate
<i>Acer macrophyllum</i>	Bigleaf maple	Stream terraces	Not appropriate for coastal location; planted additional sycamores to compensate
<i>Cupressus macrocarpa</i>	Monterey cypress	Blufftop and western and northern property boundary	Already present on blufftop; may be planted in the future along property boundaries but is not native to region

\* see Appendix 2 for list of species.

Species richness and planting density under “as-built” restoration is over three to four times greater than that proposed in the Approved Plan (Figs. 2 and 3). Approximately 4,555 additional plants, comprising 61 additional species, were planted in the restoration area.



**Figure 2. “As-Built” vs. Approved Plan Planting Density.**



**Figure 3. “As-Built” vs. Approved Plan Species Richness.**



*Item 7. Changes to Total Restoration Area.* Field changes detailed in Table 1 increased the total restoration area to approximately 3.42 acres (23% gain). Expanded restoration areas included terrace slopes formerly vegetated with blue gum eucalyptus (*Eucalyptus globulus*) trees and portions of the northeastern corner of the subject property (Item 7 on Fig. 1). Areas that formerly were covered with eucalyptus trees, whose removal per arborist recommendation, expanded the amount of area available for restoration are shown in photos 1-4, 6-7, 12-16, and 19-22 in Appendix 1.

*Item 8. Changes to Monarch Butterfly Food Plants.* The Approved Plan called for planting one adult food source (*Eriogonum fasciculatum*), and one larval food source (*Asclepias fascicularis*). Instead, two adult food sources (*Salvia leucophylla* and *Eriogonum parvifolium*), and one larval food source (*Asclepias fascicularis*), was planted along the terrace slopes and uplands areas, and in numbers greater than that called for in the Approved Plan (Item 8 on Fig. 1).

*Item 9. Southern Path to Stream Terrace and Beach.* The path at this location was little more than an eroded ravine that conveyed sediment-laden surface runoff from the southern half of the property into Toro Canyon Creek. Section 6.3 of the Approved Plan called for removing the patch and planting native vegetation. Revegetation of the slope north of the path was completed in May-June 2011 and is being monitored to meet or exceed the performance criteria outlined in the Approved Plan. Revegetating the slope south of the path is on-hold pending permit review. Once permitted, a bioswale (south bioswale) will be constructed along the south edge of the path to de-silt and de-energize surface runoff to Toro Canyon Creek (see discussion Item 3 above). Once these efforts have been completed, the original path will be narrowed by at least 50% of its former width and erosion and sedimentation will be halted (Item 9 on Fig. 1). Photos 10-11, 13-16, and 23-24 in Appendix 1 show before and after comparisons of site conditions at this location.

*Item 10. Use of Dune Sedge to Create Coastal Meadow on Stream Terraces.* The Approved Plan called for planting up to four species of native grasses on the northern and southern stream terraces and adjacent banks--meadow barley, California brome, small-seeded muhly, and giant rye (Tables 5 and 6). One species, giant rye (*Leymus condensatus*), was present on-site naturally and its numbers have been supplemented with additional plantings. California brome was planted as seed in the northeastern corner of the subject property. Reasons for not using the other two species are described in Table 2.

Figure 4 of the Approved Plan only generally mapped conceptual restoration of these stream terraces and did not direct the species to be used on these features. After planting the edges of the southern terrace with riparian woodland and scrub understory shrubs and ground cover, it was decided to plant dune sedge (*Carex praegracilis* aka *C. pansa*) in the center of the terrace. Dune sedge is a superior alternative to small-seeded muhly, meadow barley, or other ground cover at this location because: a) these sandy stream terraces lie less than five feet above sea level and extend 30-600 feet back from the beach; b) the terrace floor soil is at least 90% sand, and; c) dune sedge occurred locally in

similar habitats, and may have been present at this location. This last point is documented by the following sources:

- *R.F. Hoover. 1970. Vascular Plants of San Luis Obispo County, California: "...common near the coast, especially in hollows among sand-dunes" and "...in sand near the sea".*
- *C.F. Smith. 1995. A Flora of the Santa Barbara Region, California: "Colonies scattered, sometimes over large areas about sandy hollows of dunes and on flats around marshes [around river mouths]" and "Along coast about sand spits, meadows, hollows of dunes, marshes, ponds, and springs (fresh and salt)."*
- *P.H. Raven et al. 1986. Flora of the Santa Monica Mountains, California: present in "seasonally moist flats at low elevations [around coastal drainages]."*
- *Local collection records (Consortium of California Herbaria (ucjeps.berkeley,.edu):*
  - *sand spit at Goleta Beach (1932);*
  - *sandy border of the salt marsh and sand spit in Sandyland in 1931 (this locality is less than two miles east of the subject property);*
  - *coastal meadow off Veronica Springs Road in Santa Barbara (1932).*

Dune sedge is a locally-occurring species typical of sandy terrace, back-dune, and foredune habitats along the coast, including low-elevation terraces near the mouths of coastal streams, such as those found on the subject property. Therefore, use of dune sedge here is both ecologically and biogeographically appropriate.

Dune sedge also was selected as a superior ground cover here because:

- It has a much higher ground cover rate, growth rate, and viability relative to other native grasses, thus can resist invasion of non-native species. When first planted, occasional mowing at a height of four inches is recommended to stimulate rhizome production and lateral spread. Once established, it will be left un-mowed to attain a natural height of 6-8 inches and a more natural clumped appearance.
- It can tolerate light to moderate shade provided by riparian canopy trees.
- It provides for superior erosion-control.
- It is drought-tolerant and can handle moderate foot-traffic, thus resisting invasion of non-native species as a result of mortality.

Native riparian shrubs and trees have been planted around and among the dune sedge ground cover to increase the structural heterogeneity of these sites and improve habitat quality, as called for in the Approved Plan. See photos 1-2, 6-7, 13-16, and 19-22 for before and after restoration of the terrace floor using this species.

**Future Elements to be Installed.** The following items are components of the Approved Plan that have yet to be installed. They are mapped sequentially on Fig. 1 as Items 11-16.

*Item 11.* Item 11 has been deleted from this discussion and on Fig. 1 because the information was combined with Items 6 and 7.

*Item 12. Use of bioswales to convey surface runoff, prevent slope and bank erosion, and restore freshwater marsh habitat.* As previously discussed under Item 3, the Approved Plan proposed only one bioswale, the south bioswale. The size and configuration of this feature has been modified from the Approved Plan. The south bioswale has been partially constructed. This feature and the north bioswale will be completed upon permit review.

These bioswales will serve three functions: a) collect and convey surface runoff from the upland portion of the subject property to Toro Canyon Creek; b) eliminate bank erosion and significant sediment inputs to the creek, and; c) create freshwater marsh habitat by planting the cobble-lined surfaces of these bioswales with the following species:

**Table 4. Suggested Plant Palette for Bioswales  
(information transmitted to M. Mooney, County P&D,  
via e-mail on 21 February 2012).**

<b>North Bioswale</b>	
<b>Scientific Name</b>	<b>Common Name</b>
<i>Carex praegracilis</i>	Dune sedge
<i>Equisetum sp.</i>	Scouring rush
<i>Juncus patens</i>	Common rush
<i>Juncus textilis</i>	Indian rush
<i>Muhlenbergia rigens</i>	Deer grass
<i>Polystichum munitum</i>	Western sword fern
<i>Woodwardia fimbriata</i>	Giant chain fern
<b>South Bioswale</b>	
<i>Anemopsis californica</i>	Yerba mansa
<i>Carex praegracilis</i>	Dune sedge
<i>Equisetum sp.</i>	Scouring rush
<i>Juncus patens</i>	Common rush
<i>Juncus textilis</i>	Indian rush
<i>Leymus condensatus</i>	Giant rye
<i>Muhlenbergia rigens</i>	Deer grass

As requested by California Coastal Commission staff during their site visit on 27 September 2011, these erosion features will be stabilized and revegetated using a “soft-touch” approach including use of small rocks covered with soil and planted with native wetland plants to decrease water velocity, allow runoff to percolate into the stream terraces, and de-silt the water before it enters Toro Canyon Creek. See Item 3 for additional information. Photos 14, 23-24, and 27 in Appendix 1 show current conditions of these features.

*Item 13. Terrace Slope Erosion – Use of Boulders.* The terrace slopes leading to Toro Canyon Creek were known to be somewhat erosive, but the magnitude of this instability and the extent to which it would preclude revegetation, was not anticipated in the Approved Plan. Closer inspection of the soils on the slopes adjacent to the southern stream terrace showed them to be composed mostly of fill containing a large amount of

trash (tires, glass, wood, and other debris), that apparently was pushed over the edge of slope during grading activities conducted by previous owner(s).

Section 6.3 of the Approved Plan anticipated that other erosion control measures, such as boulders, might have to be used during restoration on steep slopes. After multiple iterations of planting and re-planting these areas, only to have the plants and surrounding soil slide down the slopes toward the creek, additional soil stabilization measures were implemented. Various options were considered and large rocks were added to the steeper portions of the slopes for their stabilizing qualities, and planting continued around them. Photos 1-2, 13-16, and 21-22 in Appendix 1 show before and after restoration of these slopes using boulders. Additional boulders may be necessary to complete restoration of the slopes adjacent to the cage gabion wall.

*Terrace Slope Erosion – Installation of Cage Gabion Wall.* Not part of the Approved Plan, an approximately 80-foot long segment of the steepest portion of the slope along the southwestern edge of the southern stream terrace was stabilized with cage gabions filled with large cobble and installed in a stair-step arrangement nearly up to the geological top-of-bank (Photos 25-26 in Appendix 1). This structure was installed in late 2010 by the owner in order to: a) control on-going soil erosion that was impacting lower Toro Canyon Creek and the terminal lagoon; b) prevent future slope failure that would have inundated these wetlands; c) provide a stable substrate on which to plant native vegetation, and; d) protect an important Native American cultural site from future erosion.

The horizontal surfaces of the cages will be covered with soil and the entire structure will be planted with native trees, shrubs, and ground cover to obscure it from view upon permitting of the cage gabion wall. Candidate species palettes and methods for revegetating this structure were transmitted to Anne Almy (County P&D) in a letter dated 1 March 2011. They are:

- All horizontal surfaces of the structure will be capped with clean, imported topsoil to provide a substrate for planting native vegetation. Soil will be placed on the horizontal surfaces with hand tools (shovels, rakes) and will be raked or swept into interstices of cobbles using brooms and/or a hose until a 6-inch to 8-inch thick, lightly compacted soil cap has been created.
- The following native species will be planted on and around edges of cage gabion structure to match existing restoration on adjacent slopes:
  - Purple sage (*Salvia leucophylla* ‘Pt. Sal’) – prostrate, spreading shrub
  - Blueblossom (*Ceanothus thyrsiflorus* or *Ceanothus* ‘Ray Hartman’) – large shrub-small tree; plant on horizontal surface and on adjacent slope to obscure edges of structure
  - Toyon (*Heteromeles arbutifolia*) – large shrub/small tree; plant on horizontal surfaces and adjacent slope around structure to obscure edges
  - Beach strawberry (*Fragaria chiloensis*) – ground cover to cascade down vertical surfaces of gabion; roots where runners contact ground

- Catalina perfume (*Ribes viburnifolium*) – medium-sized shrub with cascading growth form to cover vertical surfaces of gabion
- Dune sedge (*Carex praeegracilis*) – grass-like ground cover for horizontal surfaces.
- California sunflower (*Encelia californica*) – rambling shrub to cover horizontal and vertical surfaces
- Seed mix of 16 annual and perennial wildflowers (see list in Appendix 1); seed will be hand-sown on horizontal surfaces and raked into interstitial spaces; self-propagating; will form complete ground cover with dune sedge and beach strawberry.
- Drip irrigation will maintain the container plants for at least one year or until self-sufficient. Dead material will be replaced with similar species and numbers, as needed. The structure will be weeded and soil added, as necessary, especially following rains.
- Plantings will be monitored for growth, survivorship, and cover for a period of three years post-planting, consistent with meeting or exceeding the performance standards outlined in the Approved Habitat Restoration and Revegetation Plan for this portion of the parcel.
- Planting will begin as soon as the structure is permitted, the final few cages are installed, the safety fence is installed, and the soil cap is in place.

*Item 14. Western Property Boundary.* The Approved Plan calls for planting Monterey cypress, coast live oak, and western sycamore along the western property boundary upon completion of the landscaping plans for adjacent areas outside the restoration zone (Item 14 on Fig. 1).

*Item 15. Plantings in Bluff Setback Area.* Additional container stock of coastal bluff shrubs, such as purple sage, lemonadeberry, and California encelia, will be planted in the bluff setback area upon completion of landscaping plans for adjacent areas outside the restoration zone (Item 15 on Fig. 1).

*Item 16. Privacy Hedge on Northern Property Boundary.* The Approved Plan calls for removing the existing myoporum (*Myoporum laevis*) hedge along the Padaro Lane side of the property and replacing it with a native hedge-forming species. Candidate native shrubs that can be trained into a privacy hedge include California wax myrtle (*Myrica californica*) and lemonadeberry (*Rhus integrifolia*).

**Conclusion.** In all cases, “as-built” restoration exceeds the Approved Plan goals with significant benefits to plant and wildlife habitat, which were to: a) stabilize slopes and control soil erosion; b) improve water quality in Toro Canyon Creek, and; c) replace non-native vegetation with native species that have high wildlife value. In short, the “as-built” effort exceeds the letter and intent of the Approved Plan.

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**APPENDIX 1. BEFORE AND AFTER  
SITE PHOTOGRAPHS**





**1. Southern terrace slope looking southwest. Non-native vegetation has been removed and boulders were placed on slope to stabilize soil for planting sites. Coast live oaks and white alder have been planted on slopes. 12 September 2009.**



**2. Same site as above after revegetation with native species. Dune sedge (left) and wood mint (right) on terrace floor grades into canyon sunflower, seacliff buckwheat, ceanothus, gum plant, common aster, elderberry, and other species on slope. 22 May 2012.**





**3. Southern stream terrace and western bank of Toro Canyon Creek, looking northeast, prior to restoration. Terrace was highly disturbed, with bare soil and large patches of invasive, non-native vegetation (mustard, castor bean, periwinkle, etc.). 12 September 2009.**



**4. Same site as above, after restoration. Non-native vegetation has been replaced with California blackberry, yarrow, beach strawberry. Planted trees include black cottonwood and western sycamore. Western bank of creek supports common horsetail, cattails, and yellow nut-grass. Eastern bank is covered with cape ivy and other non-native species (see next photo). 22 May 2012.**





**5. Banks of Toro Canyon Creek adjacent to southern stream terrace showing effects of restoration. Before restoration, the western bank (foreground) used to be covered with same non-native species that still cover the eastern bank (neighboring property). Natives here include scouring rush, cattails, and yellow nut-grass. Eastern bank is a mixture of Algerian ivy and cape ivy. 22 May 2012.**





**6. Southern stream terrace, looking north, prior to restoration. Slopes at right were covered with mostly dead or dying blue gum eucalyptus. Floor of terrace was either bare soil or weeds (castor bean, bull mallow, ice plant, etc.), with a few scattered western sycamores and blue gum saplings. 12 September 2009.**



**7. Same view as above, after restoration. Healthy eucalyptus trees have been retained (upper left). Portions of terrace floor have been planted with dune sedge, which grades into patches of giant rye, California rose, wood mint, and canyon sunflower. Western sycamore, black cottonwood, box elder, and arroyo willow have been planted along edges of terrace and on creek banks. Ceanothus, elderberry, mugwort, and other species have been planted on the slope at right. 22 May 2012.**





**8. Northern terrace, looking north, prior to restoration. Well is visible in center of terrace. Horse corrals have been removed. Note condition of terrace floor and adjacent slopes. 12 September 2009.**



**9. Same view as above. Terrace floor has been planted with western sycamore, holly-leaved cherry, arroyo willow, coast live oak, elderberry, coffeeberry, box elder, and western spice bush. Slope at right retains natural coast live oaks. Giant chain fern, western sword fern, alum root, hummingbird sage, canyon sunflower, California grape, blue-eyed grass, seacliff buckwheat, and other species. 22 May 2012.**





**10. Lower terrace, looking south from edge of creek toward beach. Southern stream terrace and adjacent slope, prior to restoration. Slope and creek banks are covered with ice plant and other non-native vegetation. When this vegetation was removed, slope soils were too unstable to plant. 12 September 2009.**



**11. Same view as above. Cage gabion wall was installed to stabilize a portion of the slope for planting. Note proliferation of planted native vegetation along top of bank of creek at left. Ground cover includes yarrow, California blackberry, beach strawberry, giant rye, seaside daisy, and Indian rush. Slopes in background have been planted with coastal bluff scrub shrubs and ground cover. Cage gabion wall will get similar treatment. 22 May 2012.**





**12. Slopes of southern stream terrace, prior to restoration, covered with bull mallow. 3 Feb 2010.**



**13. Same view, after non-native vegetation has been removed. 28 May 2010.**





**14. Same view after restoration. Slopes shrubs include purple sage, ceanothus, and other native shrubs. Trees planted here include coast live oak, western sycamore, and white alder. Terrace floor has been planted with dune sedge, beach strawberry, CA blackberry, wood mint, canyon sunflower, and other species. Former erosion channel at left has been lined with cobbles and will be planted with native freshwater marsh species. Bare soil will be planted with similar shrub and ground cover species as in adjacent areas. 22 May 2012.**





15. Southern terrace and slopes looking north from beach, prior to restoration. Path to beach runs through cut in slope at left and down center of photo. Note ice plant on adjacent slopes. 28 May 2010.



16. Same view after restoration. Non-native vegetation and bare soil has been replaced with coastal bluff scrub, riparian scrub, and oak-sycamore riparian woodland species. 22 May 2012.





**17. Northern stream terrace slopes at start of plant installation. Slopes were formerly covered with garden nasturtium (*Tropaeolum majus*) and fumitory (*Fumaria officinalis*). Species planted here include coast live oak, giant chain fern, western sword fern, alum root, elderberry, southern bush monkeyflower, and a variety of other oak woodland and oak-sycamore riparian woodland species. 14 December 2010.**



**18a. Same area on 22 May 2012. Oak woodland on slopes at left grades into riparian scrub and oak-sycamore riparian woodland on floor of stream terrace. Toro Canyon Creek is right of large sycamore.**





**18b. Oak woodland and oak-sycamore riparian woodland restoration on north stream terrace. Understory plantings include canyon sunflower, wood mint, giant chain fern, western sword fern, elderberry, California grape, and other species. Terrace slope in background has been planted with seacliff buckwheat, which grades into other coastal bluff scrub shrubs in upland areas. 22 May 2012.**





**19. Floor of southern stream terrace just after planting dune sedge plugs. 22 March 2011.**



**20. Same view on 22 May 2012. Toro Canyon Creek runs left to right behind trees in background then off right side of photo to ocean. Bare soil in foreground is portion of terrace floor that will be restored with restoration of cage gabion wall.**





21. Southern terrace floor looking southwest, a few months after planting. Dune sedge covers footpath. Ground cover to left and right of path is wood mint, California rose, canyon sunflower, and California blackberry. 22 March 2011.



22. Same view as in previous photo. Successful restoration of oak-sycamore riparian woodland and riparian scrub. Weedy slope in background will be restored pending permitting of the cage gabion wall. 22 May 2012.





23. Path to southern stream terrace and beach before restoration. Worker is spraying bull mallow with a systemic herbicide (Rodeo). Toro Canyon Creek is behind worker. Note weedy, disturbed condition of terrace slopes. Note erosion channel running downslope along toe of slope at right. 3 February 2010.



24. Same view. Terrace slope at left has been planted with purple sage, ceanothus, and other coastal bluff scrub shrubs. Slope at right has not yet been restored. Erosion channel has been lined with cobbles and will be restored with freshwater marsh species. Vegetation on terrace floor and bank of Toro Canyon Creek includes beach strawberry, CA blackberry, yarrow, Indian rush, yellow nut-grass, and other species. 22 May 2012.





25. Cage gabion slope looking south. 5 May 2009 (photo courtesy of M. Mooney).



26. Same view, 20 February 2012.





**27. Erosion feature on slope of north terrace that will be restored as the north bioswale. Surface flows from the northern half of the property are severely eroding this slope and creating significant sediment inputs to Toro Canyon Creek during storm events. 22 May 2012.**

**APPENDIX 2. SPECIES PLANTED AS OF MAY 2011**  
(List sent to M. Mooney, P&D on 21 February 2012)

Species Planted as of May 2011		
Scientific Name	Common Name	Number Planted
<i>Acer negundo</i>	Box elder	5
<i>Achillea millefolium</i>	Yarrow	5
<i>Alnus rhombifolia</i>	White alder	13
<i>Arctostaphylos 'Emerald Carpet'</i>	Manzanita	100
<i>Arctostaphylos 'Pacific Mist'</i>	Manzanita	75
<i>Artemisia californica</i>	Coastal sagebrush	23
<i>Asclepias fascicularis</i>	Narrow-leaved milkweed	15
<i>Aster chilensis</i>	Common aster	50
<i>Atriplex californica</i>	California saltbush	seed
<i>Bromus carinatus</i>	California brome	seed
<i>Calycanthus occidentalis</i>	Western spicebush	3
<i>Camissonia cheiranthifolia</i>	Beach primrose	seed
<i>Carex praegracilis</i>	Dune sedge	3,600
<i>Castilleja exserta</i>	Owl's clover	seed
<i>Ceanothus foliosus x thrysiflorus 'Centennial' [low]</i>	Ceanothus	30
<i>Ceanothus impressus x papillosus 'Concha' [tall]</i>	Ceanothus	15
<i>Ceanothus thrysiflorus 'Yankee Point' [mid ht]</i>	Ceanothus	268
<i>Ceanothus arboreus x thrysiflorus 'Ray Hartman' [tall]</i>	Ceanothus	5
<i>Cercis occidentalis</i>	Western redbud	3
<i>Clarkia amoena semi-dwarf</i>	Farewell-to-Spring	seed
<i>Collinsia heterophylla</i>	Chinese houses	seed
<i>Coreopsis gigantea</i>	Giant coreopsis	4
<i>Dendromecon rigida</i>	Island bush poppy	11
<i>Dichelostemma capitatum</i>	Brodiaea	seed
<i>Dryopteris arguta</i>	Coastal wood fern	50
<i>Encelia californica</i>	Coastal encelia	17
<i>Epilobium canum</i>	California fuschia	18
<i>Eriogonum parvifolium</i>	Seacliff buckwheat	83
<i>Eriogonum umbellatum</i>	Sulfur buckwheat	15
<i>Eriophyllum nevinii</i>	Island snowflake	9
<i>Eriophyllum confertiflorum</i>	Golden yarrow	seed
<i>Eschscholzia californica</i>	California poppy	seed
<i>Fragaria chiloensis</i>	Beach strawberry	200
<i>Gilia capitata</i>	Globe gilia	seed
<i>Gilia tricolor</i>	Bird's eye	seed
<i>Gnaphalium californicum</i>	Green everlasting	14
<i>Grindelia stricta</i>	Gum plant	24
<i>Heteromeles arbutifolia</i>	Toyon	8
<i>Iris douglasiana 'Canyon Snow' and standard</i>	Douglas iris	75
<i>Juncus patens</i>	Common rush	35
<i>Layia platyglossa</i>	Tidy tips	seed
<i>Leymus condensatus 'Canyon Prince'</i>	Giant wild rye	50
<i>Lupinus densiflorus 'Ed Gedling'</i>	Golden lupine	seed
<i>Lupinus nanus</i>	Sky lupine	seed
<i>Lupinus succulentus</i>	Arroyo lupine	seed
<i>Mentzelia lindleyii</i>	Lindley's blazing star	seed
<i>Mimulus longiflorus</i>	Bush monkey flower	seed
<i>Myrica californica</i>	Pacific wax myrtle	5
<i>Nemophila menziesii</i>	Baby blue eyes	seed
<i>Penstemon heterophyllus</i>	Foothill penstemon	25
<i>Penstemon spectabilis</i>	Showy penstemon	36
<i>Phacelia grandiflora</i>	Large-flowered phacelia	seed
<i>Philadelphus lewesii</i>	Mock orange	22
<i>Platanus racemosa</i>	Western sycamore	20
<i>Populus balsamifera</i>	Black cottonwood	4
<i>Prunus ilicifolia</i>	Holly-leaved cherry	2
<i>Quercus agrifolia</i>	Coast live oak	61
<i>Rhamnus californica</i>	Coffeeberry	10
<i>Rhamnus californica 'Leatherleaf'</i>	Coffeeberry	20
<i>Rhus integrifolia</i>	Lemonadeberry	10
<i>Ribes malvaceum</i>	Chaparral currant	10



<i>Ribes sanguineum</i> var. <i>glutinatum</i>	Pink-flowering currant	5
<i>Romneya coulteri</i>	Matilija poppy	54
<i>Rosa californica</i>	California rose	62
<i>Rubus ursinus</i>	California blackberry	98
<i>Salix lasiolepis</i>	Arroyo willow	27
<i>Salvia apiana</i>	White sage	10
<i>Salvia leucophylla</i>	Purple sage	29
<i>Salvia leucophylla</i> 'Bee's Bliss'	Purple sage variety	15
<i>Salvia leucophylla</i> 'Pt. Sal'	Purple sage variety	10
<i>Salvia spathacea</i>	Hummingbird sage	41
<i>Sambucus mexicana</i>	Elderberry	10
<i>Sisyrinchium bellum</i>	Blue-eyed grass	150
<i>Stachys bullata</i>	Wood mint	250
<i>Typha latifolia</i>	Broad-leaved cattail	50
<i>Venegasia carpesioides</i>	Canyon sunflower	14
<i>Vitis californica</i> 'Rogers Red'	California grape	2
<i>Woodwardia fimbriata</i>	Giant chain fern	50
<b>TOTAL</b>	<b>78 species</b>	<b>5915</b>
Sources: SB Natives (Gaviota); Matilija Nursery (Moorpark); San Marcos Growers (Goleta); Baron Bros. Nursery (Fillmore); Jimenez Nursery (Carpinteria); ABE Nursery (Carpinteria); Manzanita Nursery (Solvang)		