# Biological Resources Assessment
# 30732 Pacific Coast Highway, Malibu, California

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## March 6, 2008

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# Executive Summary

Following are the main findings and conclusions of the biological and geomorphological investigations of the parcel at 30732 Pacific Coast Highway, Malibu, California. Please refer to the body of the report and its Summary and Conclusion for additional detail regarding the items summarized here.

- Coastal dunes are present on the project site, and they form part of a larger coastal dune ecosystem at Broad Beach. This dune ecosystem is classified as ESHA under the City of Malibu LCP.
- We detected three special status species on or near the project site during our field surveys: Red Sand Verbena, Globose Dune Beetle, and White-tailed Kite. Glenn Lukos Associates surveyed the site for the Silvery Legless Lizard in February 2008 with negative results, and will conduct an additional survey for this species in March 2008. We also plan supplemental focused surveys for the Globose Dune Beetle in off-site areas and the Sandy Beach Tiger Beetle both on and off the project site.
- We find that the stringline approximates the boundary between (a) landforms and associated organisms, including special status species, that are dependent on coastal processes and (b) landforms and associated organisms that are not dependent on coastal processes. The undeveloped portion of the subject property north of the stringline consists almost entirely of ruderal habitat dominated by introduced plants, including invasive exotic species.
- We recommend that all portions of the site north of the beach that are proposed to be preserved (a total of 0.6 acre) be placed under a conservation easement and restored/enhanced and maintained.
- We support in concept the restoration plan prepared by Read (2005) but recommend no more than two trails be established. We also recommend that all plants and seeds used in the restoration effort represent local genotypes.
- Other biological mitigation measures that we consider worthy of consideration include the use of recycled plastic board-walks instead of at-grade trails; provision of interpretive signs that highlight and explain the sensitivity of the dunes and that advise against disturbance by humans or their pets; and limited/environmentally appropriate night lighting.
- We are not aware of any biological evidence that would require the establishment of an undeveloped buffer north of the stringline, but we will conduct supplemental beetle and legless-lizard surveys in order to reach a scientifically justified opinion in this regard.
- We recommend that approximately 415 sq. ft. (0.01 ac.) of disturbed dune habitat that occurs north of the stringline be exchanged for restoring approximately 1,710 sq. ft. (0.04 ac.) of ruderal habitat that extends south of the stringline. This would result in a net increase of approximately 1,295 sq. ft. (0.03 ac.) of dune-like habitat

and would normalize the boundary of the dune and dune-like habitat south of the stringline.

- Toward achieving the conservation goals set in the LCP, we recommend that the City of Malibu establish a standard land use policy regarding the Broad Beach dunes that is designed to restore and maintain over the long term their habitat values and biological integrity.

# Introduction

Malibu Bay Company owns a property that covers approximately 2.08 acres located at 30743 Pacific Coast Highway, hereafter the "project site" or "site," on a stretch of the Malibu coast known as Broad Beach (Figures 1, 2). Malibu Bay Company proposes to subdivide the site into four properties that would support residential development on their northerly portions and ecological preserves on their southerly portions.

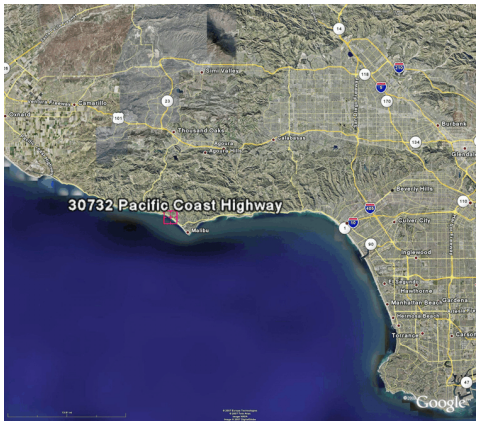


Figure 1, Regional Location (left). The project site is located in the north-western part of Malibu, approximately three miles up the coast from Pt. Dume.


Figure 2, Project Vicinity (right). The site is located near the southern end of Broad Beach, roughly 200 feet northwest of the mouth of Trancas Creek. Zuma Beach is located on the other side of the creek mouth. The site is bounded by Pacific Coast Highway on the north, by single-family residences on the east and west, and by the Pacific Ocean on the south.

The California Coastal Commission designates all "dunes" in Malibu as Environmentally Sensitive Habitat Areas (ESHA) pursuant to the City's Local Coastal Program (LCP). The definition of "dune" is not provided in the LCP, and different investigators have reached different conclusions regarding the limits of a possible "dune ESHA" on this property. Therefore, Malibu Bay Company contracted with consulting biologist Robert A. Hamilton to coordinate a multidisciplinary effort to:

1. provide peer review of prior biological studies conducted on the site;
2. conduct additional site surveys as needed to delineate dunes and to describe the biological values present on the project site; and
3. comment on questions presented in association with a determination of project consistency with the Malibu Local Coastal Program (LCP).

The specialists assembled by Mr. Hamilton for the review include four ecologists, a coastal geomorphologist, a herpetologist, and a specialist in the delineation of wetlands and other jurisdictional areas. The four-member "ecological team" was brought together with a primary charge to review existing maps and reports, to visit and examine the site, to consider input from coastal geomorphologist Norbert Psuty and other specialists (see

below) to reach a consensus opinion regarding the proper delineation of dunes and ESHA on the site. Our work has been completely independent and our findings and recommendations represent our best professional judgments, grounded in our experience and the scientific literature.

During the same period when the ecological team was evaluating this property, Hamilton coordinated the work of the additional following specialists:

- Geomorphologist and coastal dune specialist Norbert Psuty (under contract to Hamilton) conducted a study that focused on delineating the project site's dunes based on geomorphological principles.
- Wetlands specialist Tony Bomkamp of Glenn Lukos Associates (under contract to the Malibu Bay Company) evaluated the potential for the site to support jurisdictional wetlands (per California Coastal Commission and U.S. Army Corps of Engineers methods), streambeds (per California Department of Fish and Game methods), or waters of the United States (per U.S. Army Corps of Engineers methods).
- Herpetologist Justin Meyer of Glenn Lukos Associates (under contract to the Malibu Bay Company) conducted a focused survey for the Silvery Legless Lizard (*Anniella pulchra pulchra*).

Stand-alone reports by Psuty[1], Bomkamp[2], and Meyer[3] provide their methods, findings, and conclusions. Drafts of these reports were reviewed by the ecological team during the preparation of this report.

## Methods

The ecological team, consisting of the signatories to this report (Robert A. Hamilton, Daniel S. Cooper, Wayne R. Ferren, Jr., and Cristina Sandoval), possesses a broad range of experience studying the plant and wildlife communities of coastal southern California. Please see Appendix D for the team members' curricula vitae.

The Malibu Bay Company provided the following documents describing the project site's biological resources for the team's review and information:

- Read, E. 19 July 1999. Vegetation and Sensitive Resource Evaluation. Tentative Parcel Map No. 24070 (Trancas Canyon/Broad Beach Property), Malibu Bay Company.
- Longcore, T., and C. Rich. 8 November 2002. Review of Biological Resources Analysis in Malibu Bay Company Development Agreement Draft EIR.
- Envicom. 23 April 2003. Response to Comments—Review of Biological Resources Analysis in Malibu Bay Company Development Agreement Draft EIR.

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[1] Psuty, N. 22 November 2007. Report on site visit, October 30, 2007; Broad Beach, Malibu, Coastal Dunes; review of other materials.

[2] Bomkamp, T. 2007. Jurisdictional Determination for Four Lots, Broad Beach, 30732 Pacific Coast Highway, Malibu, California.

[3] Meyer, J. 2008. Results of Focused Surveys for the Silvery Legless Lizard (*Anniella pulchra pulchra*) for the 2.08-Acre Broad Beach Property, Malibu, Los Angeles County, California.

- Envicom. July 2003. Final Draft EIR SCH# 20011051063 for Malibu Bay Company Development Agreement.
- Forde Biological Consultants. 15 November 2005. Biological Inventory: 30732 Pacific Coast Highway (APN 469-026-005) in the City of Malibu.
- Read, E. 1 December 2005. Restoration Plan for Coastal Foredunes, 30732 Pacific Coast Highway, (Broad Beach) Malibu, California.
- Reznick, D. 12 October 2006. Memorandum to file re: Malibu Yacht Club – 30732 Pacific Coast Highway.
- Read, E. 23 October 2006. Assessment of Historic and Current Biological Resources, 30732 Pacific Coast Highway (Broad Beach).
- Rincon Consultants, Inc. 6 December 2006. Biological Resources Constraints Discussion, 30732 Pacific Coast Highway (Broad Beach), City of Malibu, Los Angeles County, California.
- Forde, A. 11 December 2006. Letter to David Reznick, Malibu Bay Company.
- Read, E. 18 December 2006. Letter to David Reznick, Malibu Bay Company. Subject: Rincon Consultants' Biological Constraints Discussion of MBC Property at 30732 Pacific Coast Highway.
- U. S. Fish & Wildlife Service (USFWS). 13 February 2007. Letter from Chris Dellith of the USFWS Ventura Field Office to M. Andriette Culbertson regarding the potential need for the USFWS to consult with other federal agencies under Section 7 of the federal Endangered Species Act.
- USFWS. 18 April 2007. Letter from Steve Henry of the USFWS Ventura Field Office to M. Andriette Culbertson clarifying that the proposed project would include a 25-foot buffer from then-mapped dunes instead of the 100-foot buffer referenced in the 13 February 2007 letter listed above.
- Read, E. 30 May 2007. Dune Delineation Map.
- Read, E. 30 July 2007. Assessment of the Extent of Coastal Foredunes at 30732 Pacific Coast Highway (Broad Beach): A Review of the Science.

Appendix C provides our team's review comments on the documents listed above.

In addition to the reports by Psuty (2007), Bomkamp (2007), and Meyer (2008) mentioned previously, we reviewed current and historical aerial imagery, including that available at the California Coastal Records Project web page[1]. In an effort to determine any changes in the distribution of sand and vegetation on the northern part of the property, the Malibu Bay Company undertook a concerted effort to track down any and all aerial photos of the site taken in 1976 and early 1977.

Hamilton calculated the acreages of ecological communities specified in this report using the polygon measurement tool in Google Earth Pro.

## Site Visits

In aggregate, the four members of the ecological team spent a total of approximately 29 person-hours in the field evaluating the project site and adjacent areas. This total does not

[1] http://www.californiacoastline.org/cgi-bin/image.cgi?image=200601652&mode=sequential&flags=1&year=current

include time spent on the site by wetlands specialist Tony Bomkamp and herpetologist Justin Meyer of Glenn Lukos Associates, each of whom conducted focused investigations in support of the ecological team's effort to delineate and describe the site's resources, nor does it include the two hours that coastal geomorphologist Norbert Psuty spent investigating the site's dunes.

On the afternoon of 27 September 2007, the four members of the ecological team first visited the site for several hours to document the plants and wildlife present on the site and in adjacent areas, to evaluate the potential for sensitive species to occur on the site, and to note the distribution of certain plant and insect species typically associated with dunes or other sandy areas. During this visit, Sandoval and Ferren (with input from Cooper and Hamilton) created a preliminary field map of the site's ecological communities. Ultimately, our team deferred to geomorphologist Psuty's expertise in the delineation of the project site's dune features, but only after seeing that our ecologically based delineation of "foredunes" substantially coincided with the area that Psuty delineated as a "broad foredune system." Similarly, we deferred to Bomkamp's expertise in the evaluation of potential jurisdictional areas after our own site investigations did not lead us to map any areas as streambeds, vernal pools, or other water-associated features despite our noting a minor pattern of water runoff (i.e., sheet runoff from Pacific Coast Highway) that passes across the northern portion of the site.

On 15 October 2007, Cooper visited the site for approximately one hour to collect more data on wildlife use of the site and nearby areas.

On the afternoon of 24 October 2007, Sandoval and Hamilton visited the site for roughly three hours to conduct a focused survey for the Globose Dune Beetle (*Coelus globosus*). We also used a hand shovel to more closely examine the soils along the interface between areas regarded as dunal and non-dunal, and we made additional wildlife observations.

On the afternoon of 30 October 2007, Hamilton met with Norbert Psuty for roughly two hours to show him the site and to make additional wildlife observations.

On the afternoon of 22 December 2007, Hamilton spent approximately two hours on the site and elsewhere on Broad Beach looking for any sensitive vertebrates that might be using the site as part of a wintering territory. He was present from 2:30 to 5:10 p.m. (after dusk) to determine whether the site was being used as a foraging area by a White-tailed Kite that Cooper saw along Broad Beach on 15 October. Hamilton also searched Broad Beach for wintering Snowy Plovers during this visit.

On the afternoon of 14 January 2008, Sandoval and Hamilton spent approximately two hours looking for Snowy Plovers and Globose Dune Beetles on the site and elsewhere on Broad Beach.

# Results

## Analysis of Historical Aerial Imagery

Members of the ecological team reviewed the California Coastal Records Project's series of historical and current aerial images, which date back to 1972, to trace land uses on the site during the last 35 years.

### 1972 to 1987 (and into the 1990s)—Malibu Yacht Club

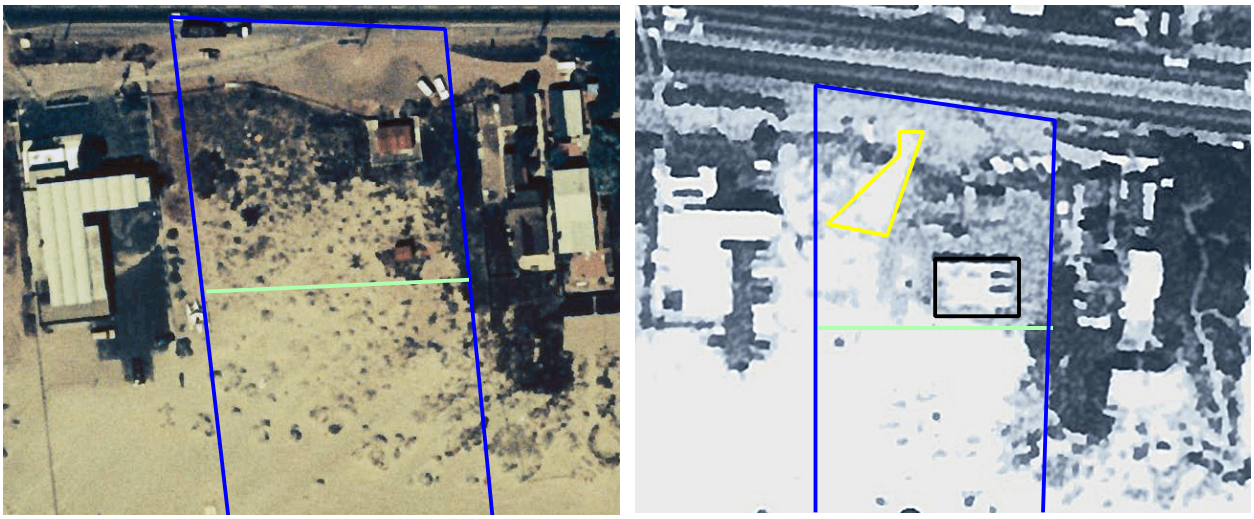
The "Malibu Yacht Club" occupied the site between 1972 and some time in the 1990s. On 12 October 2006, former Club members Warren Seaman, Craig Hunter, David Von Oeyen described the Club and its functions to David Reznick of the Malibu Bay Company. The following points summarize information contained in Mr. Reznick's memorandum to file documenting their conversation:

- The Club functioned as a base for the day use of sailboats, primarily catamarans, which were stored on trailers in a fenced boat yard located in the northern part of the site.
- The Club sponsored weekend races for up to 200 boats and usually stored 50 to 70 in the boat yard.
- The Club included a small, roofless structure with a dance floor, changing rooms, lockers, showers, a small kitchen, and "chemical" toilets.
- The Club used an all-terrain vehicle to haul the boats on their trailers through a wide path through the dunes to the surf line for launching.

As shown in Figure 3, white sand extended into the northern half of the project site in 1972, the year when the Malibu Yacht Club was established there (and on the adjacent property to the west). Figure 4 shows that, by 1980, actions associated with the club's establishment and operation had resulted in white sand being limited to areas south of the stringline.

Figures 3, 4. Aerial images showing the project site in 1972 (upper left, day/month unknown) and 1980 (upper right, day/month unknown). Approximate project site boundary is shown in blue; approximate "stringline" between developed parts of the adjacent properties is shown in green. White sand extended north of the stringline in 1972, but the shore-parallel foredune ridge was not intact, suggesting some level of disturbance. By 1980, the Malibu Yacht Club had established a pathway to Pacific Coast Highway (outlined in yellow), erected a clubhouse (outlined in black), and largely cleared two other areas (outlined in red). Figure 3 copyright © 2004 Kenneth and Gabrielle Adelman. Figure 4 courtesy of the Malibu Bay Company.

Figures 5 and 6 show that the bulk of the disturbance took place some time between 6 August 1976 and July 1977. The Malibu Bay Company was unable to find additional aerial images that would enable a determination of the weeks or months when the major clearing took place, but given the operational characteristics of yacht clubs, the Malibu Bay Company believes that this work probably took place in late 1976, after the end of the sailing season and before the start of winter storms. The analysis of historical photos on Pages 9 and 10 of the accompanying report by coastal geomorphologist Norbert Psuty (2007) provides additional information regarding the site during this period.



Figures 5, 6. To help evaluate the timing of site disturbances noted in Figure 4, the Malibu Bay Company obtained aerials dated 6 August 1976 (upper left) and July 1977 (upper right). Approximate project site boundary is shown in blue; approximate "stringline" between developed parts of the adjacent properties is shown in green. Figure 6 is of poor quality, but it does show that disturbances for the pathway off Pacific Coast Highway (outlined in yellow) and clubhouse (outlined in black) took place some time between 6 August 1976 and July 1977 (the two dates for which photos could be obtained). Both courtesy of the Malibu Bay Company.

## 23 September 2002—Construction Staging

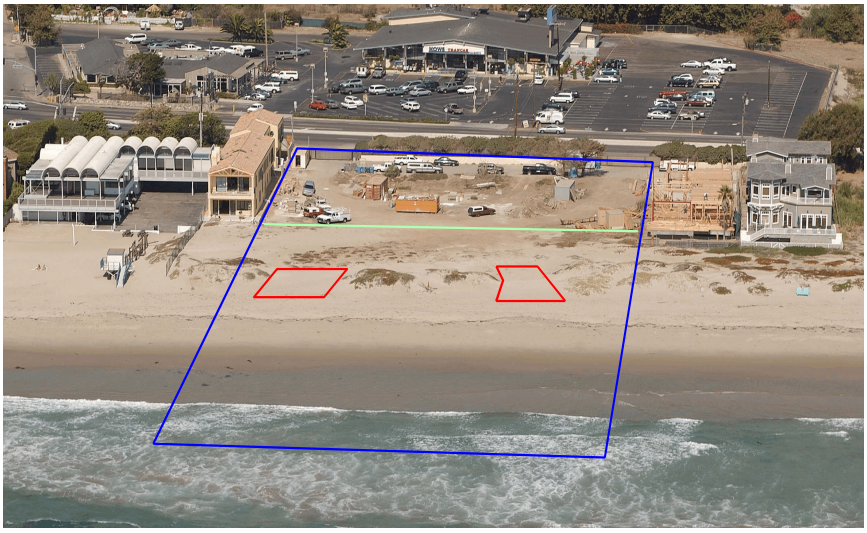


Figure 7. Aerial image showing the project site on 23 September 2002. Approximate project site boundaries are shown in blue; approximate "stringline" between developed parts of the adjacent properties (as of 2007) is shown in green. Comparing this image with Figures 3 and 4, note that gaps in the foredune, indicated here in red, correspond to areas that were impacted by Malibu Yacht Club activities in earlier decades. Copyright © 2002–2006 Kenneth and Gabrielle Adelman.

As Figure 7 shows, the entire undeveloped area north of the stringline was used in 2002 as a staging area for crews constructing the homes authorized under Coastal Development

Permits on either side of the project site. Thus, this portion of the site showed signs of ongoing disturbance in 1977, 1980, and 2002. The two main gaps in the site's foredune ridge, highlighted in red above, persist to the present time (see Figure 8).

## Current Ecological Communities/Geomorphological Features

During our initial field visit, on 27 September 2007, the four members of the ecological team tentatively identified areas that we regarded as dunal versus non-dunal. Sandoval and Ferren used aerial imagery from Google Earth dated 27 January 2006 at approximate scale 1 inch equals 86 feet to produce a field map of these areas. As discussed previously, under "Methods," we later modified our mapping to conform to Psuty's (2007) mapping of dunal features. Our final map is shown in Figure 8.


Figure 8. Ecological Communities. Approximate project site boundary is shown in blue; approximate "string-line" between developed parts of the adjacent properties is shown in green. Dunal features identified by Norbert Psuty on the site are the broken foredune ridge, mobile hummocks, and stable hummocks (Psuty 2007).

The **developed** northerly portion of the project site, consisting of an access road, wall, and planter, covers approximately 0.25 acre. Vegetation in this area consists of plantings of four non-native species, Small-flowered Myoporum (*Myoporum laetum*), coral tree (*Erythrina* sp.), Indian Hawthorn (*Rhaphiolepis indica*), and Heartleaf Iceplant (*Aptenia cordifolia*) along the shoulder of Pacific Coast Highway.

The **ruderal** portion of the site, an area that appears to have been filled with imported soil and gravel material at an unknown date, covers approximately 0.61 acre at the site's northern end (0.57 acre north of the stringline, 0.04 acre south of it). As reviewed in the preceding section, the Malibu Yacht Club's boatyard and two structures occupied this part of the site starting in 1972 and ending some time in the 1990s, and construction crews used it as a staging area in 2002. This area is dominated by introduced weeds, such as Highway Iceplant (*Carpobrotus edulis*) and Australian Saltbush (*Atriplex semibaccata*), and introduced

annual grasses, such as Italian Ryegrass (*Lolium multiflorum*) and Ripgut Brome (*Bromus diandrus*). Native plant species present in low numbers include two shrub species, Coast Goldenbush (*Isocoma menziesii* var. *menziesii*) and California Sagebrush (*Artemisia californica*), and the perennial herb, Telegraph Weed (*Heterotheca grandiflora*).

As reviewed by Bomkamp (2007), runoff from Pacific Coast Highway enters the ruderal area from the northwest and flows to the south-central part of the ruderal area, where the water apparently collects briefly in a shallow depression (e.g., during our field visits, we noted cracked surface soils in this depression that are an indication of ponding). The Lechuza Patrol weather station in Malibu[1] recorded 0.91 inches of precipitation on 12 and 13 October 2007, and on 15 October Cooper found no standing water on the site. The Lechuza Patrol station recorded 3.38 inches of precipitation between 17 and 20 December 2007, and on 22 December Hamilton found no standing water on the site. The Lechuza Patrol station recorded 4.84 inches of precipitation between 4 and 6 January 2008, and on 14 January Hamilton and Sandoval found no standing water on the site. Bomkamp (2007) determined that the project site does not include any areas that potentially meet wetlands criteria of the California Coastal Commission, streambed criteria of the California Department of Fish and Game, or wetlands/waters of the United States criteria of the U.S. Army Corps of Engineers.

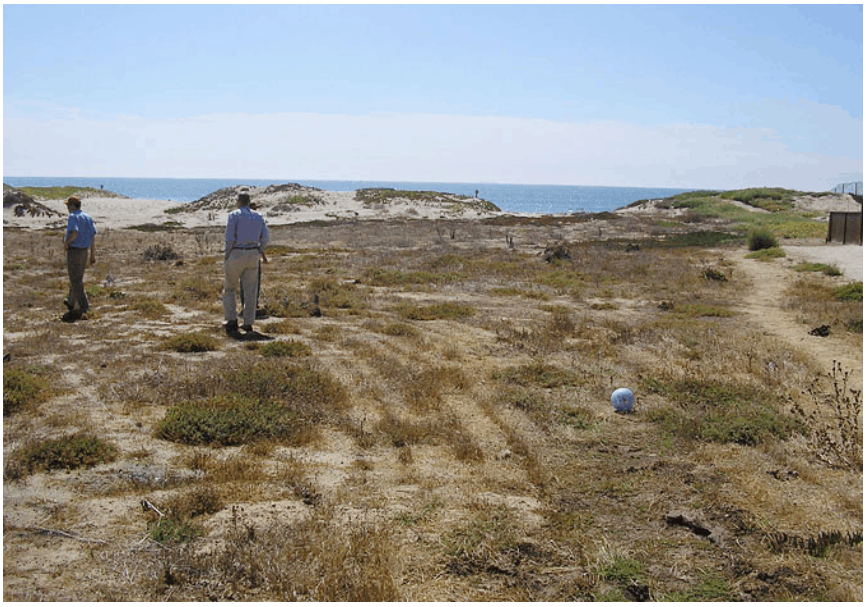


Figure 9. Photo taken 27 September 2007 facing southwest showing the ruderal part of the site in the foreground and a fragment of foredune ridge in the background.

The area designated as **primrose/lupine** covers approximately 0.10 acre. This area's mixed substrate includes sand, coarser sand, silt, and some gravel. The area is dominated by the native, sand-dependent species, Beach Primrose (*Camissonia cheiranthifolia* ssp. *suffruticosa*) and the native Succulent Lupine (*Lupinus succulentus*) along with various introduced weedy species. The sand in this area is darker and coarser than the white, eolian sand of the foredunes, and is mixed with imported material as an apparent result of past site disturbance. It appears that this area historically was part of the broad foredune system;

[1] http://ladpw.org/wrd/precip/

as reviewed in the previous section, white sand evident in this part of the site as of August 1976 had been removed by July 1977 as a result of activities associated with operation of the Malibu Yacht Club. Degradation resulting from human activities during that period, including the apparent importation of silt and gravel into this area, as well as blockage of substantial sand transport into this part of the site (see Figure 10), stripped this area of most of its dune processes and features.

Consistent with this interpretation, coastal geomorphologist Norbert Psuty (2007:12) did not classify this area among the site's dunal formations:

> Related to form and function, these stabilized hummocks are not part of the normal foredune system and they were created by an unusual and presumably temporary condition from offsite [i.e., the chain-link fence erected by the nearby swim club].

Figure 10. Photo taken 27 September 2007 facing west from near the "stringline." In the foreground is ruderal vegetation, most of it dead. The area delineated as "primrose/lupine" is in the midground, where the soil is a somewhat lighter color. The fence in the background, indicated with a blue arrow, was installed some time before 1980 by the swim club situated two properties up the beach from the project site. This fence has a buildup of white sand and vegetation that tends to block the flow of eolian (wind-blown) sand from the southwest that would otherwise come into this part of the site.

Psuty incorporated these stabilized hummocks into the generalized area that he mapped as "disturbed," but we have called it out separately based on differences in soils and vegetation between this area and the ruderal zone to the north. Features that differentiate this area from the ruderal zone are sandy soils (but little or no wind-blown sand) and the prevalence of Beach Primrose, a native species that requires well-drained soils and that frequently occurs on coastal dunes. The presence of Beach Primrose does not, by itself, serve to delineate a dune ecosystem. For example, Ferren has recorded Beach Primrose on a coastal mesa in Santa Barbara County 100 feet above sea level. The primrose/lupine area appears, in some respects, like a "backdune" area, but we believe that this term is best restricted to an ecological community formed and maintained by natural processes. In light of these factors, we have classified this disturbed area according to its dominant native plant species.

The following descriptions of the site's dunal areas are adapted from a report on the site's geomorphology (Psuty 2007), which describes the site's dunes in greater detail.

A **foredune ridge** is a geomorphological feature that is in active exchange of sand with the beach. It is at the inland margin of the free sand beach and the seaward margin of pioneer vegetation[1]. The pioneer vegetation serves as a sediment trap that causes sand to accumulate in a ridge parallel to the shoreline. The site's "broken foredune ridge," shown in Figure 11, covers a total of approximately 0.13 acre, and supports native Red Sand Verbena (*Abronia maritima*), Beach Bursage (*Ambrosia chamissonis*), and Beach Primrose, as well as exotic Highway Iceplant and Sea Rocket (*Cakile maritima*). The biologically sensitive Globose Dune Beetle (*Coelus globosus*) was found mainly in this part of the site (see the attached report by Cristina Sandoval). The Ciliate Dune Beetle (*Coelus ciliatus*), not a sensitive species, was found mainly on Stable Hummocks located a short distance inland (described subsequently).

Figure 11. Photo taken 27 September 2007 facing north from the beach. Part of the broken foredune ridge, vegetated with Red Sand Verbena and Highway Iceplant, is visible behind the two people.

Eolian (wind-blown) sand can travel inland through breaches and blowouts in a foredune ridge. The subsequent topographical forms created inland of the ridge produce geomorphological features that are referred to as secondary coastal dunes[2]. Psuty (2007) referred to the site's broken foredune ridge and the secondary coastal dunes as the "foredune system." On the project site, Psuty identified two classes of secondary coastal dunes:

- **Mobile hummocks** that extend up to tens of feet inland of the broken foredune ridge. These are 0.5–1.5 feet high, often supporting a small amount of vegetation,

[1] Martínez, M. L., Psuty, N. P., and Lubke, R. A. 2004. A Perspective on Coastal Dunes. Pp. 1–10 *in* M. L. Martínez and N. P. Psuty (eds.), Coastal Dunes: Ecology and Conservation. Springer-Verlag (Berlin).

[2] Psuty, N. P., 2004. The Coastal Foredune: A Morphological Basis for Regional Coastal Dune Development. Pp. 11–27 *in* M. L. Martínez and N. P. Psuty (eds.), Coastal Dunes: Ecology and Conservation. Springer-Verlag (Berlin).

with intervening bare areas called "lag surfaces." Mobile hummocks cover approximately 0.09 acre on the site.

- **Stable hummocks**, generally 30–90 feet inland from the broken foredune ridge (see Figure 7 in Psuty 2007). On the site, these hummocks form a zone of secondary coastal dunes approximately 0.21 acre in size that is oriented from west to east, with an increasing inland distance toward the east. They are the topographical features, less than 1.0 foot high and in the range of 5–8 feet across, formed near the margin of the eolian-transported accumulation in contact with stabilizing vegetation. The zone of stable hummocks is transitional between the actively-moving sand and the ruderal and primrose/lupine zones located farther inland.

The southernmost part of the site, defined as **beach**, covers approximately 0.74 acre. This, the intertidal and supratidal portion of the site, is a flat, mostly unvegetated area with occasional piles of ocean wrack and driftwood.

Figure 12. Photo taken 27 September 2007 facing west-southwest. From left to right this image shows the edge of the foredune ridge, then the sparsely vegetated zone of mobile hummocks, then the zone of stable hummocks, largely vegetated with Highway Iceplant; taken together, Psuty (2007) refers to these areas as the "broad foredune system." The low, brown vegetation beyond the Highway Iceplant at the right edge of the image is ruderal vegetation in the midground, which transitions to the primrose/lupine association farther to the west.

## Wildlife Observations

As discussed in the following section on "special status" species, and as reviewed in greater detail in the attached report by Cristina Sandoval, we detected both Globose and Ciliate dune beetles on the site. We found the Globose Dune Beetle mainly on the broken foredune ridge, but some individuals were using the most seaward stable hummocks, reflecting a slight overlap in habitat preferences between this beetle and the very similar Ciliate Dune Beetle, which occurs mainly on the stable hummocks located slightly farther inland.

We detected two common reptile species, the Western Fence Lizard (*Sceloporus occidentalis*) and Side-blotched Lizard (*Uta stansburiana*), mostly in the ruderal and primrose/lupine areas.

We recorded 28 bird species on the site, or flying over it, including the Red-tailed Hawk (*Buteo jamaicensis*), American Kestrel (*Falco sparverius*), Sanderling (*Calidris alba*), Marbled Godwit (*Limosa fedoa*), Allen's Hummingbird (*Selasphorus sasin*), Say's Phoebe (*Sayornis saya*), Hermit Thrush (*Catharus guttatus*), Yellow-rumped Warbler (*Dendroica coronata*), Lincoln's Sparrow (*Melospiza lincolnii*), House Finch (*Carpodacus mexicanus*), and Brewer's Blackbird (*Euphagus cyanocephalus*).

We saw diggings of Botta's Pocket Gopher (*Thomomys bottae*) and the tracks of unknown small mammals on the site, as well as rabbit pellets, presumably from Audubon Cottontails (*Sylvilagus audubonii*). On 22 December Hamilton watched an off-leash domestic dog (*Canis familiaris*) run through the site.

## Special Status Species

The previously referenced July 2003 Final Draft EIR on a multi-property Development Agreement that was then sought by the Malibu Bay Company provided a thorough rundown on special status species with potential to occur at lower Trancas Creek and in nearby areas, including the project site. Here we provide supplemental information that concentrates on (1) species specifically associated with dunes and other habitats with sandy soils, and (2) listed species for which we have found information additional to that reported by Envicom (2003) and Read (2006)[1].

## Species Observed On or Flying Over the Project Site

We observed three special status species during the course of our field visits.

**Red Sand Verbena (*Abronia maritima*)** is a plant that the California Native Plant Society (CNPS) places on its List 4.2, a "watch list" for species of limited distribution that CNPS regards as "fairly endangered" in California[2]. Red Sand Verbena occurs fairly commonly on the site's broken foredune ridge and scattered individuals occur elsewhere south of the stringline.

The **Globose Dune Beetle (*Coelus globosus*)** is a federal "Species of Concern" and California Special Animal, the latter designation referring to taxa with restricted and/or declining populations that are monitored by the California Natural Diversity Database. As shown in Figure 13, this beetle occurs on the project site's broken foredune ridge and on the seaward portion of the stable hummocks. Appendix B to this report describes the methods and results of a focused survey for this species conducted on the site in October 2007 by Cristina Sandoval.

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[1] Read, E. 23 October 2006. Assessment of Historic and Current Biological Resources, 30732 Pacific Coast Highway (Broad Beach).

[2] http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi/Go?_id=abronia_maritima&sort=DEFAULT&search=abronia%20maritima.

A **White-tailed Kite (*Elanus caeruleus*)**, another California Special Animal and a Fully Protected Species (meaning that hunting and collecting are prohibited by the State of California), was observed foraging and perching adjacent to the site on 15 October 2007 by Dan Cooper. In an effort to determine whether this bird included the project site as part of its winter territory, Hamilton searched for it during field visits on 24 and 30 October, and spent the afternoon of 22 December (from 2:30 to 5:10 p.m.) on and around the site looking for this species. At 4:27 p.m. on 22 December he observed a White-tailed Kite fly from northwest to southeast over the project site. This bird appeared to be in transit between a daytime use area located up the coast from the site and a roosting site located down the coast from the site. The kite did not hover over, perch near, or otherwise pause while flying over the site. Hamilton watched it fly down the coast until it was out of sight.


Figure 13. During a focused survey on 24 October 2007, Cristina Sandoval found Globose Dune Beetles throughout the red-shaded area. Areas farther inland were found to be occupied by the more widespread Ciliate Dune Beetle. A distance of roughly 45–95 feet wide lies between the stringline and the area occupied by the Globose Dune Beetle.

## Species Potentially Occurring On or Near the Project Site

The **Sandy Beach Tiger Beetle (*Cicindela hirticollis gravida*)** is a California Special Animal. This beetle raises larvae near creek mouths and forages for smaller invertebrates along the high tide lines of beaches. This species has potential to occur on the project site, and a summer survey will be conducted to determine its presence or absence.

The site-specific biological reports prepared to date have discounted the potential for **Southern Steelhead (*Oncorhynchus mykiss irideus*)** to occur in Trancas Creek, located approximately 200 feet south of the project site, and the USFWS has not designated this creek as critical habitat for the fish. We note, however, that a recent status review for this fish in the Santa Monica Bay region[1] concluded that, although the species has not been recorded in Trancas Creek since 2000, it probably occurred there historically. Some relevant excerpts regarding the species' known and potential status there include the following:

> Much of the upper portion of this 10 square mile watershed is owned by the National Park Service. Development is concentrated on the west side, with privately held open space on the east bank. Opportunity for lagoon restoration is dependant on acquisition of this land to prevent additional development. This lagoon was identified for wetland restoration by the Santa Monica Bay Restoration Project, 1993.
>
> Additional biological impacts have been documented related to the explosion of non-native crayfish, which have decimated much of the native amphibian fauna. Conditions in the creek itself could provide suitable steelhead habitat.
>
> 1980's John Steckwald caught several 8 inch trout and observed good steelhead habitat. (interviewed for this report)

We believe that a project at the proposed development site, which conforms to the requirements of the Regional Water Quality Control Board, would unlikely result in any identifiable effects on the Southern Steelhead. The species' potential for future occurrence in lower Trancas Creek, however, should not be discounted entirely, especially if the estuary is restored.

Regarding the **Silvery Legless Lizard (*Anniella pulchra pulchra*)**, a California Species of Special Concern, Read concluded that, "due to the limited extent of the system, pedestrian traffic, neighborhood cats, and iceplants, legless lizards are likely absent." Also, "Presence of iceplant likely reduces the amount of moisture within dune features, which may render them unsuitable for this species. Removal of iceplant as part of the restoration plan will likely improve habitat potential of this species." We agree with the latter statement, but note that the species can co-occur with iceplants. Justin Meyer of Glenn Lukos Associates conducted a focused survey for this species on the site in February 2008 with negative results, and he will conduct a second and final focused survey in March 2008. The following summary is from Page 10 of his report, dated 15 February 2008:

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[1] Dagit, R., Drill, S., and Meyer, B. 2005. Historic distribution of Southern Steelhead in the Santa Monica Bay region. Report dated July 2005 prepared for the California Department of Fish and Game and National Ocean and Atmospheric Administration Fisheries.

> On the Project Site, loose, sandy soils appropriate for use by the silvery legless lizard occur on the foredune ridge and in the mobile hummocks, but these areas do not support the native plant species preferred by legless lizards. Based on the site reconnaissance and one focused survey, it is GLA's opinion that the silvery legless lizard is not expected to occur within the foredune ridge or mobile hummocks areas due to the past disturbance of the Project Site, encroachment of surrounding development, the lack of native plant species typically found in areas occupied by the silvery legless lizard, and the presence of Highway Iceplant as the dominant plant on the dunes.

As previous reports have noted, the project site lies within critical habitat for the federally threatened **Western Snowy Plover (*Charadrius alexandrinus nivosus*)**[1]. During comprehensive surveys conducted during five weeks spread across the first half of 2007[2], the portion of Zuma Beach located north of Zuma Creek and south of Trancas Creek was found to be the plover's single most important wintering site in Los Angeles County, with a high seasonal total of 75 birds during the period of 5–11 March 2007. As shown in Figures 2 and 3 of the SWCA report, no plover sightings came from the strip of beach along the Broad Beach dunes, or from the dune habitat itself. Another round of surveys conducted during January 2008 turned up approximately 80 birds on the same stretch of Zuma Beach and no reports from north of Trancas Creek[3]. In a 13 February 2007 letter to M. Andriette Culbertson, Chris Dellith of the USFWS noted that the project site "is subjected to frequent disturbance by beach goers and their pets as an access route to Broad Beach."His letter included the following summary paragraph:

> We concur with your determination that the proposed action would not result in take of the western snowy plover. Our concurrence is based on the following: 1) western snowy plovers are not known to occur within the area proposed for development; 2) western snowy plovers are not known to nest at Broad Beach; 3) western snowy plover surveys will be conducted prior to any restoration activities associated with dune disturbance; and 4) if a western snowy plover is detected, the Service will be contacted and the appropriate level of permitting will be attained before work may resume. Please be aware that this letter does not authorize the take, in any manner, of any threatened or endangered species. If any listed species is observed on the site prior to or during project activities, all actions that could result in take of a listed species should cease and the Service should be contacted.

We have searched for wintering Snowy Plovers during several site visits but have not found any on the project site or elsewhere on Broad Beach. Although the species may occur occasionally on Broad Beach, it appears that repeated disturbances and the site's configuration, with a thin strip of beach/dune habitat backed by houses, combine to make the site generally unsuitable for either wintering or nesting plovers.

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[1] USFWS. 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). http://fws.gov/arcata/es/birds/WSP/plover.html

[2] SWCA Environmental Consultants. 2007. The Western Snowy Plover in Los Angeles County, California: Winter-Spring 2007. Report dated 8 October 2007 prepared for the California Department of Fish and Game and the National Fish and Wildlife Foundation by SWCA, Los Angeles Audubon, and Santa Monica Bay Audubon.

[3] Tom Ryan, SWCA, e-mail message to R. A. Hamilton dated 31 January 2008.

## Recommendations for Delineating a Dune ESHA on the Project Site

Hamilton examined the City of Malibu's LCP Local Implementation Plan, ESHA Overlay Map 1, and confirmed that the nearest mapped ESHA is located at the mouth of Trancas Creek, approximately 200 feet southeast of the project site. Section 30242 of the City of Malibu's Local Coastal Program (LCP) Land Use Plan allows for the establishment of ESHA beyond those mapped in the LCP Land Use Plan, and specifically requires that dunes be identified as ESHA:

> Areas in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments are Environmentally Sensitive Habitat Areas (ESHAs) and are generally shown on the LUP ESHA Map. The ESHAs in the City of Malibu are riparian areas, streams, native woodlands, native grasslands/savannas, chaparral, coastal sage scrub, dunes, bluffs, and wetlands, unless there is site-specific evidence that establishes that a habitat area is not especially valuable because of its special nature or role in the ecosystem.

It is our team's recommendation that the project site's dunal areas (i.e., the broken foredune ridge, mobile hummocks, and stable hummocks) be recognized as ESHA (see Figure 14).


Figure 14. In this 2007 aerial image, the approximate project site boundary is shown in blue and the "stringline" between developed parts of adjacent properties is shown in green. The recommended dune ESHA, which corresponds to the "broad foredune system" (Psuty 2007) south of the stringline, is shown in pink. This figure also shows a dunal area covering 0.01 acre just north of the stringline (outlined in yellow) that is proposed for development in exchange for the restoration of 0.04 acre of ruderal habitat that extends south of the stringline (outlined in light blue). These areas are shown in Figures 15 and 16, and the potential swap is discussed in the subsequent section. The primrose/lupine area is also proposed for restoration. All of these areas south of the stringline would be preserved/restored and placed under a conservation easement.

The 1972 and 1976 photos reproduced here as Figures 3 and 5, as well as the presence of Red Sand Verbena and Globose Dune Beetle, suggest to us that this dune system probably originated naturally rather than having been created by human actions. We believe that the broken foredune ridge—that is, the portion of the dunes of greatest value to these two special status species—is the most biologically valuable part of the site's dune system, but that the landward mobile and stable hummocks also warrant recognition as ESHA since they are dunal features that support native plant and wildlife species. For reasons

explained on Pages 9–10 of this report, we do not recognize the area designated as "primrose/lupine" as part of the site's foredune complex. As shown in Figure 4, the existing conditions in this 0.10-acre part of the site appear to have been created by artificial disturbances that date to some time between 6 August 1976 and July 1977. Also relevant, the primrose/lupine area appears unlikely to develop dunal characteristics in the foreseeable future because the flow of sand into this part of the project site is minimal (see Figure 10 and also Psuty 2007).

As to whether the primrose/lupine area ought to be identified as a non-dunal ESHA based on its intrinsic value as a biological resource, Section 30107.5 of the California Coastal Act defines an "Environmentally Sensitive Area" as:

> . . . any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

The primrose/lupine area is disturbed in the existing condition, and we see no evidence suggesting that this non-dunal area provides especially valuable habitat for special status species. For these reasons we do not believe that this area satisfies ESHA criteria given in Section 30107.5. We regard this area as having moderate biological values and recommend preserving and restoring/enhancing this area along with the site's dunes.

## Recommendations for Preserving and Enhancing the Biological Integrity of Preserved Areas

The dunes on the project site comprise a small component of a dune ecosystem that extends from the mouth of Trancas Creek for nearly a mile northwest along Broad Beach. Figures 15 and 16 show representative areas near the project site.

Figures 15, 16. These photos, taken on 22 December 2007, show the extent and generally degraded condition of the Broad Beach dune ecosystem/ESHA. Figure 15 shows dunes and homes that exist northwest of the site. The foreground of Figure 16 shows sparsely vegetated dunes on the project site that extend southwest into the neighboring properties. Highway Iceplant, an exotic species, is the predominant groundcover visible in these photos.

When evaluating the prospects for restoring and maintaining the biological integrity of the on-site dunes, it is important to note that failure to protect the biological integrity of the Broad Beach dune ecosystem as a whole has led to widespread degradation and disturbance of the habitats.

Section 4.6.1 of the City of Malibu's LCP Local Implementation Plan (LIP) states:

> New development adjacent to the following habitats shall provide native vegetation buffer areas to serve as transitional habitat and provide distance and physical barriers to human intrusion. Buffers shall be of a sufficient size to ensure the biological integrity and preservation of the habitat they are designed to protect. Vegetation removal, vegetation thinning, or planting of non-native or invasive vegetation shall not be permitted within buffers except as provided in Section 4.6.1 (E) or (F) of the Malibu LIP. The following buffer standards shall apply:

Sections 4.6.1 (A) through 4.6.1 (F) go on to specify buffer standards for stream/riparian, wetlands, oak or other native woodland, coastal bluff, coastal sage scrub, and chaparral ESHA. Section 4.6.1 (G) applies to other areas designated as ESHA:

> For other ESHA areas not listed above, the buffer recommended by the Environmental Review Board or City biologist, in consultation with the California Department of Fish and Game, as necessary to avoid adverse impacts to the ESHA shall be required.

This discretionary buffer standard applies to dune ESHA in the City of Malibu.

As Figures 8 and 12 show, the project site's westernmost "stable hummocks" lie approximately 59 feet south of the stringline, whereas the easternmost hummocks actually extend a few feet north of the stringline. Since these stable hummocks are dunal, and therefore qualify as dune ESHA, we must evaluate the potential value of establishing a buffer between developed areas and the stable hummocks. The following observations provide guidance in this matter.

- Globose Dune Beetles, Red Sand Verbena, and other sensitive dune species are most likely to be found on the site's broken foredune ridge. The northernmost portion of the foredune ridge extends to within 110 feet of the stringline near the western project boundary, 82 feet of the stringline in the middle of the site, and 60 feet of the stringline at the eastern site boundary. As shown in Figure 13, the area of potentially suitable habitat for the Globose Dune Beetle includes some of the sandy hummocks slightly inland from the foredune ridge. At least for the sensitive species known to be present, the less biologically sensitive stable hummock habitat serves as a form of "buffer" approximately 45–90 feet wide between the stringline and the more biologically sensitive foredune ridge and sandy hummock habitats.

- A correlation exists between the land-use history of residential parcels along Broad Beach and the general decline of habitat value of the dunes for coastal-dependent special interest plants and animals. Widespread human-related disturbances, loss of habitat, and the ongoing spread of Highway Iceplant and other destructive exotic

plant species are products of this land-use history. Measures likely to reverse this tendency toward habitat degradation consist of Construction Best Management Practices associated with any additional development, eradication of Highway Iceplant as part of a well-considered dune habitat restoration program, lighting restrictions, and focused human access through establishment of formal trails and interpretive signage. These measures are anticipated to result in overall enhancement of the existing conditions of the foredune system with or without the addition of a formal buffer area.

We are not aware of any biological evidence that would require the establishment of an undeveloped buffer north of the stringline, but we will conduct supplemental beetle and legless-lizard surveys in order to reach a scientifically justified opinion in this regard.

With specific regard to the Globose Dune Beetle, we note that this species tends to favor the most seaward portions of coastal dune ecosystems. Since such areas are periodically subjected to heavy surf and strong winds, it follows that the species must be adapted to episodic mechanical disturbance of its habitat. The most northerly beetle that we found on the project site was approximately 45 feet south of the stringline and approximately 65 feet from the existing residence that borders the project site to the southeast. We consider it likely that the species' distribution on the site reflects its preference for dunes dominated by native vegetation that are close to the beach.

Consistent with earlier findings by Chris D. Nagano[1], a habitat use and suitability study by Scott A. Snover[2] found that Globose Dune Beetles "occur in much higher densities under the native *Ambrosia* [*chamissonis*] than under the non-native" Highway Iceplant (*Carpobrotus edulis*) and Sea Rocket (*Cakile maritima*) (Snover 1992:53). He continued, "Clearly, the displacement of native vegetation by either *Cakile* or *Carpobrotus* will have a drastic effect on *C. globosus* [Globose Dune Beetle], and possibly other native fauna that have not, as yet, been studied in detail." This suggests that restoring the dunes at Broad Beach has good potential to increase their value as habitat for the Globose Dune Beetle.

We are unaware of any studies that would serve to confirm a minimum buffer zone that this beetle might require to persist in a dune ecosystem that is flanked by residences, but we will attempt to fill this information gap by conducting additional focused surveys for the Globose Dune Beetle on Broad Beach in spring 2008. If we do not find Globose Dune Beetles on other Broad Beach properties that appear to provide suitable foredune habitat vegetated with native species, and that include a minimum of 45 feet between development and the foredune habitat in question, this would indicate that the beetle requires more than the 45 feet of separation that would be provided on the project site without provision of a formal buffer landward of the stringline. If we find that this beetle persists on other Broad

[1] Nagano, C. D. 1982. The population status of seven species of insects inhabiting Tijuana Estuary National Wildlife Refuge, San Diego County, California. Report to the Office of Endangered Species.

[2] Snover, S.A. 1992. Ecology of the Globose Dune Beetle *(Coelus globosus*) in relation to native and non-native host plants. MS thesis, San Diego State University, San Diego, CA.

Beach properties (none of which provide a buffer landward of the stringline), this would indicate that establishing a formal buffer landward of the stringline on the project site would not contribute in important ways to maintaining habitat values for this species, and that construction Best Management Practices, dune restoration, trail placement and treatment, lighting restrictions, and establishment of a conservation easement are more likely than a buffer to protect the biological integrity and habitat values of the on-site dune ESHA. When this additional field work is completed we will prepare a supplemental report that provides our findings and any appropriate modifications to our recommendations.

In her 2006 assessment of the project site[1], Edith Read wrote:

> The small size of habitat precludes occupation by most native wildlife species apart from small reptiles (e.g. lizards) and certain invertebrates. These species do not require a large buffer zone, but it is anticipated that measures will be necessary to address ongoing threats to dune habitat, which include trampling, disturbance by pets, and root expansion of exotic species (especially iceplant) used in landscaping. While future property owners should be encouraged to plant native species in landscaping, use of iceplant in landscaping is common practice in the coastal zone and total avoidance cannot be guaranteed.

We generally agree with this evaluation. Instead of establishing a large buffer zone, Read recommended installing a "root barrier" to help prevent the invasion of exotic plants into the site. During our field visits, however, we observed that many of the site's younger specimens of Highway Iceplant did not come from the creeping stems or roots from nearby properties, but appeared to have originated from seeds or from intentional introduction of plants. This species produces many seeds per fruit that frequently are distributed by animals, and the seeds can persist for a long time in the seed bank. A root barrier would be ineffective against both infestations from seed and the intentional planting of this species by local residents, which Read acknowledged as a possibility. Therefore, we have a low degree of confidence that a root barrier would ensure the long-term biological integrity of the dune ESHA.

Toward meeting the LCP/LIP's objective of preserving and enhancing the biological integrity of the site's dune ESHA (and associated non-ESHA areas located between the beach and the stringline), we make the following preliminary recommendations:

1. Place the portion of the site located between the beach and the stringline, an area of approximately 0.6 acre, under a conservation easement (see Figure 17).
2. Restore the entire 0.6-acre preserved area in general accordance with Edith Read's 2005 restoration plan[2]. All plants and seeds used in the restoration effort should be of the local genotypes. This can be achieved by collecting propagules on the project

[1] Read, E. 23 October 2006. Assessment of Historic and Current Biological Resources, 30732 Pacific Coast Highway (Broad Beach). Report prepared for Malibu Bay Company.

[2] Read, E. 1 December 2005. Restoration Plan for Coastal Foredunes, 30732 Pacific Coast Highway, (Broad Beach) Malibu, California.


Figure 17. Recommended site configuration. We recommend that the red-shaded area, which covers 0.6 acre, be restored using locally native species/genotypes and placed under a conservation easement.

site, or from elsewhere along the coast of northern Los Angeles or southern Ventura counties, as close as feasible to the site.

3. Establish no more than two trails through the restored on-site dunes.

4. Consider using recycled plastic board-walks instead of at-grade trails.

5. Provide interpretive signs that highlight and explain the sensitivity of the dunes and that advise against disturbance by humans or their pets.

6. Use only limited and environmentally appropriate night lighting.

7. Normalize the boundary between development and dune/restoration area by building on approximately 415 sq. ft. (0.01 ac.) of disturbed dune habitat that occurs north of the stringline in exchange for restoring approximately 1,710 sq. ft. (0.04 ac.) of ruderal habitat that extends south of the stringline (see Figures 14, 17). This would result in a net increase of approximately 1,295 sq. ft. (0.03 ac.) of dune-like habitat. Under no circumstances should sand be imported into the site with a grain size differing from the grain size measured on the existing foredune ridge.

8. In a disturbed and fragmented ecosystem such as the dunes at Broad Beach, where conservation planning is minimal or absent, it is likely that the biological values of a single parcel will become increasingly degraded over time. Even if the values to be restored at the subject parcel were to be maintained over time, the other dunal properties along Broad Beach would not be so safeguarded and the overall habitat values not enhanced, or perhaps even maintained. For this reason, we recommend that the City establish a standard land use policy regarding the Broad Beach dune ecosystem designed to restore and maintain its habitat values and biological integrity. This need is not immediate, as the dunes have been in a state of neglect for years and still possess habitat that is of value to some biologically sensitive species. It is not, however, reasonable to impose maintenance responsibilities on one small sector of dune habitat while neglecting the larger dune complex. Restoration and proper maintenance of the Broad Breach dune ecosystem can and should be accomplished over time and with cooperation of the City, resource agencies, and the property owners.

These recommendations are based on extensive work to document the biological resources present, and potentially present, on the project site, and they reflect our team's experience evaluating the effects of residential development on natural communities. As indicated in this report, additional focused surveys will be conducted for the Globose Dune Beetle, Sandy Beach Tiger Beetle, and Silvery Legless Lizard. When these surveys are complete, we will prepare a supplemental report that provides their findings. At that time, we may revise these recommendations to incorporate any new and relevant information.

## Summary and Conclusion

Having delineated the site's ecological communities in conjunction with coastal geomorphologist Norbert Psuty and wetlands expert Tony Bomkamp, having completed a review of several documents previously prepared regarding the project site and its biological resources, and having conducted a series of biological surveys of the site in conjunction with herpetologist Justin Meyer, the following points summarize our most relevant observations, opinions, and conclusions:

- A coastal dune ecosystem consisting of a broken foredune ridge, mobile hummocks, and stable hummocks, is present on the site and is part of a larger coastal dune ecosystem at Broad Beach.
- The City of Malibu LCP classifies all coastal dune habitat as ESHA.
- We detected three special status species on or near the project site during our field surveys: Red Sand Verbena, Globose Dune Beetle, and White-tailed Kite. Glenn Lukos Associates surveyed the site for the Silvery Legless Lizard in February 2008 with negative results, and will conduct an additional survey for this species in March 2008. We also plan supplemental focused surveys for the Globose Dune Beetle in off-site areas and the Sandy Beach Tiger Beetle both on and off the project site.

- We find that the stringline approximates the boundary between (a) landforms and associated organisms, including special status species, that are dependent on coastal processes and (b) landforms and associated organisms that are not dependent on coastal processes. The undeveloped portion of the subject property north of the stringline consists almost entirely of ruderal habitat dominated by introduced plants, including invasive exotic species.
- Section 4.6.1 of the City of Malibu's LCP/LIP does not specify a minimum buffer for dune ESHA. On the project site, Globose Dune Beetles, Red Sand Verbena, and other sensitive dune species are most likely to be found on the site's broken foredune ridge. The northernmost portion of the foredune ridge extends to within 110 feet of the stringline near the western project boundary, 82 feet of the stringline in the middle of the site, and 60 feet of the stringline at the eastern site boundary. The area of potentially suitable habitat for the Globose Dune Beetle includes some of the sandy hummocks up to 15 feet north of the foredune ridge. Therefore, at least for the sensitive species known to be present, the less biologically sensitive stable hummock habitat serves as a form of "buffer" approximately 45–90 feet wide between the stringline and the more biologically sensitive foredune ridge and sandy hummock habitats.
- It is our opinion that non-dunal portions of the project site fail to meet the California Coastal Act's criteria for ESHA, but we recommend that all portions of the site north of the beach that are proposed to be preserved (a total of 0.6 acre) be placed under a conservation easement, enhanced, and maintained, whether or not they are delineated as ESHA.
- To accommodate a formal delineation between the different habitat or land use areas, we recommend that approximately 415 sq. ft. (0.01 ac.) of disturbed dune habitat north of the stringline be exchanged for restoring approximately 1,710 sq. ft. (0.04 ac.) of ruderal habitat that extends south of the stringline (see Figure 12). This would result in a net increase of approximately 1,295 sq. ft. (0.03 ac) of dune-like habitat and would normalize the boundary between the coastal-dependent resources south of the stringline and those not dependent on coastal processes north of the stringline.
- We support in concept the restoration plan prepared by Read (2005). Subsequent to her preparation of the plan, Read acknowledged that fewer than four trails through the dunes would reduce impacts. We recommend no more than two trails be established. We further recommend that all plants and seeds used in the restoration effort represent local genotypes.
- Under no circumstances should sand be imported into the site with a grain size that differs from the grain size measured on the existing foredune ridge.
- Other biological mitigation measures that we consider worthy of consideration include the use of recycled plastic board-walks instead of at-grade trails; provision of interpretive signs that highlight and explain the sensitivity of the dunes and that advise against disturbance by humans or their pets; and limited/environmentally appropriate night lighting.

- Dunes that exist on the project site represent only a small portion of a much larger Broad Beach dune ecosystem. Toward achieving the conservation goals set in the LCP, we recommend that the City of Malibu establish a standard land use policy regarding the Broad Beach dunes that is designed to restore and maintain over the long term their habitat values and biological integrity.

# Appendix A
# Plant and Wildlife Species Detected

## Plant Species Detected

The following plant species were observed in the study area by Wayne Ferren, Tony Bomkamp, and/or Robert Hamilton.

* Introduced species

| | Anthophyta: Dicotyledones | Dicot Flowering Plants |
|---|---|---|
| | **Aizoaceae** | **Carpet-Weed Family** |
| * | *Aptenia cordifolia* | Heartleaf Iceplant |
| * | *Carpobrotus edulis* | Highway Iceplant |
| | **Asteraceae** | **Sunflower Family** |
| | *Ambrosia chamissonis* | Beach Bursage |
| | *Artemisia californica* | California Sagebrush |
| | *Baccharis salicifolia* | Mulefat |
| | *Heterotheca grandiflora* | Telegraph Weed |
| | *Isocoma menziesii* | Coastal Goldenbush |
| * | *Sonchus asper* | Prickly Sow-Thistle |
| * | *Sonchus oleraceus* | Common Sow-Thistle |
| | **Boraginaceae** | **Borage Family** |
| * | *Echium fastuosum* | Pride of Madeira |
| | *Heliotropium curassavicum* ssp. *oculatum* | Salt Heliotrope |
| | **Brassicaceae** | **Mustard Family** |
| * | *Cakile maritima* | Sea Rocket |
| | **Chenopodiaceae** | **Goosefoot Family** |
| | *Atriplex leucophylla* | Sand Mat |
| * | *Atriplex semibaccata* | Australian Saltbush |
| * | *Chenopodium murale* | Nettle-leaved Goosefoot |
| * | *Salsola tragus* | Russian-Thistle |
| | **Euphorbiaceae** | **Spurge Family** |
| | *Euphorbia* sp. | spurge |
| * | *Ricinis communis* | Castor Bean |
| | **Fabaceae** | **Pea Family** |
| * | *Erythrina* sp. | coral tree |
| | *Lotus scoparius* | Deerweed |
| | *Lupinus succulentus* | Succulent Lupine |
| * | *Melilotus* sp. | sweetclover |

| | |
|---|---|
| **Geraniaceae** | **Geranium Family** |
| * *Erodium cicutarium* | Red-stemmed Filaree |
| **Myoporaceae** | **Myoporum Family** |
| * *Myoporum laetum* | Myoporum |
| **Nyctaginaceae** | **Four-o'clock Family** |
| *Abronia maritima* | Red Sand Verbena |
| **Onagraceae** | **Evening-Primrose Family** |
| *Camissonia cheiranthifolia* ssp. *suffruticosa* | Beach Primrose |
| **Plantaginaceae** | **Plantain Family** |
| * *Plantago lanceolata* | English Plantain |
| **Plumbaginaceae** | **Leadwort Family** |
| *Limonium perezii* | Perez's Sea-Lavender |
| **Rosaceae** | **Rose Family** |
| * *Rhaphiolepis indica* | Indian Hawthorn |
| **Angiospermae: Monocotyledonae** | **Monocot Flowering Plants** |
| **Poaceae** | **Grass Family** |
| * *Arundo donax* | Giant Reed |
| * *Bromus diandrus* | Common Ripgut Grass |
| * *Hordeum marinum* | Mediterranean Barley |
| *Lolium multiflorum* | Italian Ryegrass |

Taxonomy and scientific nomenclature mainly follow the Index to California Plant Names[1].

[1] http://ucjeps.berkeley.edu/about_ICPN.html

## Vertebrate Species Detected

The following amphibians, reptiles, birds and mammals were detected on, or flying over, the project site during the current study. Presence may be noted if a species is seen or heard, or identified by the presence of tracks, scat, or other signs.

*Introduced species

| | |
|---|---|
| **Reptilia** | **Reptiles** |
| **Iguanidae** | **Iguanid Lizards** |
| *Sceloporus occidentalis* | Western Fence Lizard |
| *Uta stansburiana* | Side-blotched Lizard |
| **Aves** | **Birds** |
| **Accipitridae** | **Hawks** |
| *Elanus leucurus* | White-tailed Kite |
| *Buteo jamaicensis* | Red-tailed Hawk |
| **Falconidae** | **Falcons** |
| *Falco sparverius* | American Kestrel |
| **Ardeidae** | **Herons** |
| *Ardea albus* | Great Egret |
| **Columbidae** | **Pigeons, Doves** |
| * *Columba livia* | Rock Pigeon |
| **Psittacidae** | **New World Parrots** |
| * *Nandayus nenday* | Black-hooded Parakeet |
| **Charadriidae** | **Plovers** |
| *Pluvialis squatarola* | Black-bellied Plover |
| **Scolopacidae** | **Sandpipers** |
| *Numenius phaeopus* | Whimbrel |
| *Limosa fedoa* | Marbled Godwit |
| *Calidris alba* | Sanderling |
| **Laridae** | **Gulls, Terns** |
| *Larus delawarensis* | Ring-billed Gull |
| *Larus occidentalis* | Western Gull |
| **Trochilidae** | **Hummingbirds** |
| *Selasphorus sasin* | Allen's Hummingbird |

| | |
|---|---|
| **Tyrannidae** | **Tyrant Flycatchers** |
| *Sayornis nigricans* | Black Phoebe |
| *Sayornis saya* | Say's Phoebe |
| **Monarchidae** | **Monarch Flycatchers** |
| *Catharus guttatus* | Hermit Thrush |
| **Regulidae** | **Kinglets, Gnatcatchers, Thrushes, Babblers** |
| *Regulus calendula* | Ruby-crowned Kinglet |
| **Sturnidae** | **Starlings** |
| * *Sturnus vulgaris* | European Starling |
| **Parulidae** | **Wood Warblers** |
| *Dendroica coronata* | Yellow-rumped Warbler |
| *Dendroica townsendi* | Townsend's Warbler |
| *Geothlypis trichas* | Common Yellowthroat |
| **Emberizidae** | **Sparrows and Buntings** |
| *Spizella passerina* | Chipping Sparrow |
| *Passerculus sandwichensis* | Savannah Sparrow |
| *Melospiza lincolnii* | Lincoln's Sparrow |
| **Icteridae** | **Meadowlarks, Blackbirds, and Orioles** |
| *Euphagus cyanocephalus* | Brewer's Blackbird |
| **Fringillidae** | **Finches** |
| *Carpodacus mexicanus* | House Finch |
| **Mammalia** | **Mammals** |
| **Leporidae** | **Hares, Rabbits** |
| *Sylvilagus audubonii* | Audubon Cottontail |
| **Geomyidae** | **Pocket Gophers** |
| *Thomomys bottae* | Botta's Pocket Gopher |
| **Canidae** | **Wolves, Foxes** |
| * *Canis familiaris* | Domestic Dog |

Taxonomy and nomenclature follow American Ornithologists' Union[1] for birds, and Laudenslayer et al.[2] for reptiles and mammals.

[1] American Ornithologists' Union. 1998. *Check-list of North American Birds*. Seventh ed. Washington, D.C. plus supplements.

[2] Laudenslayer, W.F., Jr., W. E. Grenfell, Jr., and D.C. Zeiner. 1991. A check-list of the amphibians, reptiles, birds and mammals of California. Calif. Fish & Game 77(3):109-141.

# Appendix B
# Survey of Globose Dune Beetle
# at 30732 Pacific Coast Highway (Broad Beach)

## Prepared for:
## Malibu Bay Company, Malibu, CA

## Prepared by:
## Cristina Sandoval, PhD

## November 9th, 2007

### INTRODUCTION

The goal of this survey was to understand the habitat use of the Globose Dune Beetle *(Coelus globosus*) at the Broad Beach dunes by 30732 PCH.

All species of *Coelus* are fossorial and are restricted to sand dunes or sandy substrates (Doyen 1976). They are flightless beetles because their elytra are fused together. Therefore, populations inhabiting different, isolated beaches, can have a unique evolutionary history due to its isolation from other populations. Two similar dune beetles, *Coelus globosus* and *Coelus ciliatus,* occurred on the dunes on the surveyed site. The Ciliate Dune Beetle (*Coelus ciliatus*) has a relatively wide distribution and habitat use compared with *Coelus globosus.* In the contrary*, Coelus globosus* is restricted to a narrow fringe of foredunes immediately above high tide and occurs in a few remaining populations from Bodega Head (Sonoma Co.) to Ensenada (Baja California Norte) including the Channel Islands except San Clemente (Doyen 1976). *Coelus globosus* populations north and south of Point Conception are distinct geographical variants (Doyen 1976). *Coelus globosus* and *C. ciliatus* can co-occur and are similar in appearance. They can be distinguished by a row of hair in the head, under a magnifying scope (Doyen 1976).

*Coelus globosus* is a California Special Animal, meaning that its population status is tracked by the California Natural Diversity Database. It was formerly classified by the USFWS as a "Category 2" candidate for listing as Endangered or Threatened, before Category 2 was eliminated in 1996, and it is now regarded as a federal "species of concern." These state and federal designations indicate that the species warrants consideration in long-term planning efforts.

### METHODS

During an initial site visit on September 27, 2007, I searched for Globose Dune Beetles (GDB) by looking for the tunnel tracks they live on the sand (as in Sandoval 1997). Using this method I found both species of dune beetles at the site. I returned to the site on October 24, 2007, and placed a 150 ft. transect in the foredune area starting from sample point #2 and ending at sample point #5 as in Edith Read's report of October 23, 2006. At each 10 ft., I filled a sieve measuring 23 cm x 23 cm wide by 8 cm deep with sand. Robert Hamilton assisted with this survey.

The sand was sifted and the beetles caught in the sieve were placed on a Petri dish and identified using a magnifying scope on site. The beetles were immediately released in the same place they

were found after identification. I conducted a total of 16 samples this way. For each sample point, I also noted the vegetation and soil type.

A second sampling method was conducted to maximize the chance to detect GDB, because these beetles are often patchily distributed around the dunes. I looked for tracks and used the same sieve to obtain a sample of sand in that place. I conducted a total of 12 samples this way.

## RESULTS

Using the transect method, I found 4 Ciliate Dune Beetles and no Globose Dune Beetles along the transect. Using the spot sampling, I found 25 Ciliate Dune Beetles and 7 Globose Dune Beetles. The GDB were found on dunes vegetated by Sand Verbena and Beach Bursage. All GDB were found within zone 3 (foredune).

No beetle larvae were found, as it is expected in the fall (larvae occur in the summer).

## CONCLUSION

Both species of dune beetles were found at the site. CDB occupied zones 2 and 3 while GDB occupied zone 3, which we called foredunes. This is typical of what I have seen in other beaches. The GDB seems to be more restricted to white sand dunes and beach while the CDB also utilizes backdunes where some soil may be present. The beetles were found in similar densities that I have observed in other beaches (pers. obs.).

## REFERENCES

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Sandoval, C. P. 1997. Survey of Dune Beetles at Haskell's and adjacent beaches. Report to Tynan Group Inc.

# Appendix C
# Reviews of Previous Biological Reports & Other Materials

The members of the ecological team—Daniel S. Cooper, Wayne R. Ferren, Jr., Cristina Sandoval, and me—offer the following critiques of biological reports and other materials that the Malibu Bay Company provided to us. Each of the reviewed items relates to the property at 30732 Pacific Coast Highway, although the titles of the reports may call the site by different names. We review these materials in chronological order, and include reports and other materials that were later expanded upon and updated to provide context for how investigators have viewed the site and its resources over the years.

## Read, E. 19 July 1999. Vegetation and Sensitive Resource Evaluation. Tentative Parcel Map No. 24070 (Trancas Canyon/Broad Beach Property), Malibu Bay Company.

Read mapped "sand," "dune," "ruderal," and "asphalt" polygons on the project site. The same map has been used in several subsequent reports, and Read did not change her conception of these mapping units through the latest iteration, dated 30 May 2007. Read's map illustrates three separate foredunes, two of which extend onto adjacent properties. As Read later remarked, in her 30 June 2007 "Assessment of the Extent of Coastal Foredunes at 30732 Pacific Coast Highway (Broad Beach): A Review of the Science:"

> Read (1999) delineated the limit of "coastal foredune" based on a combination of dunelike topography plus dominance of sand-verbena (*Abronia maritima*) . This delineation comes closest to the "sand-verbena-beach bursage series" defined by Sawyer and Keeler-Wolfe (1995, p. 80)[1], although beach bursage (*Ambrosia chamissonis*) can occur on sandy soils outside of dunes.

The members of the ecological team recognize that investigators from different disciplines can be expected to approach the task of delineating a "dune" in different ways. Our own concept of what constitutes a "foredune," as mapped in the field by Sandoval and Ferren during the 27 September 2007 site visit, is more expansive than Read's, but corresponds fairly closely to what coastal geomorphologist Norbert Psuty (2007: Figure 7) described as a "foredune system" consisting of the foredune ridge, mobile sand hummocks, and stable hummocks. Psuty (2007:11–12) commented on differences between Read's delineation map and his own:

> The updated dune delineation map by Read (5/30/07) appears to be based on the presence of vegetation species that inhabit dune or sandy areas and are present on this site. My interpretation of foredune conditions is based on geomorphology and has a different net distribution, but in some ways has considerable similarity. Dr. Read has mapped the presence of vegetation types. I have mapped the presence of dunal topographies. Dune topographies indicate that the active zone of eolian features related to the present foredune is narrowest at the western margin of the site and widest at the eastern margin (see Fig. 3 [in his report]). Both portrayals show the presence of the foredune and aspects of the inland

[1] Sawyer, J.O. and T. Keeler-Wolf, 1995. A Manual of California Vegetation. CNPS, Sacramento, CA.

> extension of the dunal system. A major difference in the two maps is the width of the dunal area at the western margin. I used the formation of the existing foredune as the starting point and then expanded the dunal system as it relates to the eolian transport through the gaps into a landward position. I mapped that extent as the limits to my active coastal foredune system. However, in my description of dunal features in the general vicinity of the site, I commented on the location of the beach club to the west where there was no foredune at the shoreline. I described a "foredune-like" ridge at the fence that is perpendicular to the shoreline, and inland of the general trend of the foredune crestline. That ridge is the site of very dense vegetation trapping a lot of sand moving across the bare sand surface of the beach club. Some of that sand extends into the adjacent property to the east, and it appears that there are some old, minor (stabilized) sand hummocks extending farther to the east and entering the margin of this parcel of land (30732 PCH). [Note: Here Psuty is referring to the area that the ecological team mapped as "Primrose/Lupine" in Figure 8.] Related to form and function, these stabilized hummocks are not part of the normal foredune system and they were created by an unusual and presumably temporary condition from offsite. I incorporated them in the area of disturbance of former habitat and distant from the current locus of beach/foredune interaction.

Given Psuty's expertise in the field of coastal geomorphology, we recommend that his delineation of the site's dunal features be adopted as the definitive one.

Read concluded that the three limited areas that she mapped as "coastal foredune habitat" represented "the only resource on the site that could be considered sensitive." She characterized the foredunes as degraded because of the presence of weedy plant species, and suggested that their origin was unclear (natural or human activity). We follow Psuty in identifying a larger area as comprising the "foredune system" on the project site. Although we agree with Read that the site's dunes exist in a degraded condition, as discussed subsequently we believe that they possess more biological value than Read ascribed to them in this first report or in subsequent reports.

## Longcore, T., and C. Rich. 8 November 2002. Review of Biological Resources Analysis in Malibu Bay Company Development Agreement Draft EIR.

These reviewers provided detailed comments on a DEIR prepared for a combined Development Agreement concerning several properties owned by the Malibu Bay Company, including 30732 Pacific Coast Highway. Longcore and Rich noted that the baseline conditions of the northern portion of the property were unknown because of ongoing disturbance due to its use as a construction staging area, and that the vegetation removal and disturbance could represent a violation. Although we cannot reliably describe "baseline conditions" on the site at any given point in the past, Figures 3–7 in our report show that the area north of the "stringline" has been disturbed repeatedly and for prolonged periods since the mid 1970s. Therefore, it is our opinion that any removal of vegetation or additional disturbance that occurred during the environmental review process for the DEIR in question is unlikely to have had much effect on the biological resources of the developed or ruderal parts of the site. We can verify that soils in the northern part of the site now include substantial volumes of fill material, and that this part of the site currently supports only a relative few native plants mixed with a large volume of ruderal (weedy) vegetation.

Longcore and Rich advocated designating the site's foredunes as an Environmentally Sensitive Habitat Area (ESHA). We believe that the "primary and secondary active foredune geomorphological features [that] comprise the dunal forms on the project site" (Psuty 2007) warrant designation as ESHA. Longcore and Rich expressed concern for the effects of night lighting on wildlife and recommended that "No lighting should be allowed toward the ocean at Broad Beach." This is a valid concern. The Malibu Local Coastal Program (LCP) Land Use Plan specifies:

> 6.23 Exterior lighting (except traffic lights, navigational lights, and other similar safety lighting) shall be minimized, restricted to low intensity fixtures, shielded, and concealed to the maximum feasible extent so that no light source is directly visible from public viewing areas. Night lighting for sports courts or other private recreational facilities in scenic areas designated for residential use shall be prohibited.

Longcore and Rich suggested that the DEIR provided insufficient detail to evaluate impacts to the site's biological resources, but that direct and indirect impacts would occur to the site's sensitive habitats if the proposed actions were permitted, and they recommended designating a buffer sufficient in size to reduce potential impacts to below a level of significance. As reviewed on Page 18 of our report, the City of Malibu's LCP Local Implementation Plan (LIP) makes no specific recommendation for the size of buffer to be provided for dune ESHA; instead, Section 4.6.1 (G) states:

> For other ESHA areas not listed above, the buffer recommended by the Environmental Review Board or City biologist, in consultation with the California Department of Fish and Game, as necessary to avoid adverse impacts to the ESHA shall be required.

Existing conditions that may suggest the appropriateness of a minimal buffer in this instance include (1) existing land use patterns adjacent to this project site; (2) existing foot-trails through the foredunes on the subject property; (3) conspicuous human presence along the beach; (4) presence of invasive exotic species in the ESHA; and (5) the nature of sensitivity to an incremental increase in human-related disturbance on the site exhibited by the sensitive species present or potentially present.

Opportunities exist within regulations to have a flexible approach to ESHA buffer width, using such approaches as (1) site plan design that minimizes the number of trails, with consideration for use of recycled plastic board-walking; (2) appropriate ecological restoration/landscaping within the buffer zone using only local genotypes; (3) eradication of invasive exotic species from the buffer zone and the dunes; (4) placement of a conservation easement over the preserved/restored lands; (5) provision of interpretive signs that highlight and explain the sensitivity of the dunes and that advise against disturbance by humans or their pets; and (6) limited and environmentally appropriate night lighting.

## Envicom. 23 April 2003. Response to Comments—Review of Biological Resources Analysis in Malibu Bay Company Development Agreement Draft EIR.

Envicom was generally responsive to the comments of Longcore & Rich, or they indicated that the comments were noted and would be forwarded in the review process.

Envicom focused some of their response on evaluating the appropriate ESHA buffer width to accommodate the proposed four-unit project. Envicom stated, "The proposed Broad Beach project would be entirely consistent in size, shape, density, and type with the adjacent land uses (beach front properties)." Envicom also attributed the following quote, which currently appears in Section 17.72.010 of the City of Malibu Municipal Code, to Section 17.72.100 of the City of Malibu Zoning Code:

> . . . These provisions are intended to relieve the owner of property from standards or requirements of this title which make impractical or impossible reasonable use of a property in the same manner that other property of like character in the same vicinity and zone can be used.

Envicom also quoted from Section 17.72.060:

> There are special circumstances or exceptional characteristics applicable to the subject property, including size, shape, topography, location, or surroundings such that strict application of the zoning ordinance deprives such property of privileges enjoyed by other property in the vicinity and under the identical zoning classification.

Envicom concluded that the earlier proposed development fit the requirements for a minor modification permit regarding General Plan policies and ESHA because, as stated in the Zoning Ordinance/Municipal Code, "The purpose of a minor modification permit is to permit minor modifications to the development standards warranted by practical difficulties, necessary hardships, or results that may be inconsistent with the general intent of this title or the city's land use policies and goals."

Envicom emphasized that the Zoning Ordinance/Municipal Code is intended to provide some flexibility when otherwise strict application of the code would result in the denial of a use that is consistent with the use of adjacent properties. They pointed out that mitigation measure BR-1 included standards for landscaping with local native plants when a 100-foot buffer from ESHA could not be achieved.

Envicom's responses referred to the proposed Broad Beach project's 65 to 100 foot buffer from the foredune ESHA, per the mapping of Read (1999), and referred to Section 17.72.100 of the City's Zoning Ordinance, which described a process by which the City would authorize a "Reduce[d] setback from ESHA's of no less than fifty (50) feet."

Section 17.62.040 of the City's current Zoning Ordinance/Municipal Code states:

> A. The planning manager/director may approve a site plan review after consultation with all appropriate city staff and specialists including the building official, city engineer, city biologist, city geologist, city archeologist and a coastal morphologist; and where substantial evidence supports the findings set forth in subsection D of this section for new construction or reconstruction of structures authorizing the following:
>
> . . .
>
> 7. Reduction of the one hundred (100) foot setback from an ESHA to no less than fifty (50) feet;

As noted previously, Section 4.6.1 of the City's LCP/LIP requires 100-foot buffers for various types of ESHA (e.g., riparian, wetland, coastal sage scrub, chaparral ESHA) but does *not* require a 100-foot buffer for dune ESHA. As stated in Section 4.6.1(C):

> . . .the buffer recommended by the Environmental Review Board or City biologist, in consultation with the California Department of Fish and Game, as necessary to avoid adverse impacts to the ESHA shall be required.

Since a mandatory 100-foot setback from dune ESHA is specified nowhere in the City's Zoning Ordinance/Municipal Code or the City's LCP/LIP, it appears that the "Reduction of the one hundred (100) foot setback from an ESHA to no less than fifty (50) feet" does not apply to the dune ESHA at Broad Beach.

Envicom also noted that the objective to achieve lighting compatible with wildlife would be the basis for the plan, but that lighting must be consistent with public safety requirements.

## Forde Biological Consultants. 15 November 2005. Biological Inventory: 30732 Pacific Coast Highway (APN 469-026-005) in the City of Malibu.

This biological inventory includes observations and discussions regarding vegetation, wildlife, special status species, breeding birds, and ESHA that characterize the subject property in addition to information on tree protection, environmental impacts, and proposed project alternatives. The report includes a copy of Read's 19 July 1999 "Vegetation and Sensitive Resource Evaluation," Read's dune habitat map, and a map containing suggestions regarding potential enhancements and trail locations.

The report states, "No special status plant species are expected to occur on the property," yet the site does support Red Sand Verbena (Abronia maritima), a plant that the California Native Plant Society (CNPS) places on its List 4.2[1].

[1] List 4.2 is a "watch list" for species of limited distribution that CNPS regards as "fairly endangered" in California.

Regarding the presence of ESHA, the author notes:

> As previously discussed, the ESHA and Marine Resources Map indicated the absence of ESHA; however, the dune system supports native vegetation and although degraded, meets the definition of ESHA. The dune ESHA will be protected and enhanced as part of the proposed project in accordance with the City of Malibu LCP. There are no other resources on the property that meet the definition of ESHA.

We concur with the conclusion that the "dune system" on the subject property meets the definition of ESHA according to the Malibu LCP. Regarding project alternatives, the report states, "Because alternatives need only address those that would avoid or reduce significant impacts to ESHA, and there are no significant impacts, alternatives are not proposed." Given that sensitive plant and wildlife species do occur on the site, contrary to the report's findings, we are not convinced that implementation of the then-proposed project would not have entailed potentially significant impacts to biological resources that could have necessitated the consideration of project alternatives.

## Read, E. 1 December 2005. Restoration Plan for Coastal Foredunes, 30732 Pacific Coast Highway, (Broad Beach) Malibu, California.

Read conducted a site visit on 5 November 2005 "to verify and update the previous vegetation survey. No changes in site conditions were observed that would alter the previous findings." Contrary to our findings as reviewed above, Read reported that "No threatened, endangered, or other special status species have been observed or are known to be associated with the foredunes on site." Read provided a restoration program and plant palette, maintenance protocol, monitoring program with success criteria to be conducted for a minimum of five years, and provisions for remedial actions, if required.

The restoration plan allows for four trails to the beach, one from each of the proposed homes. We recommend reducing the number of trails to a maximum of two, which would allow for the restoration of a dune with better integrity and greater habitat values for sensitive plant and wildlife species.

Contrary to Read's assertions regarding the absence of sensitive species, the confirmed presence of Red Sand Verbena and the Globose Dune Beetle require that planning for dune restoration include consideration of these species (and others potentially present), including appropriate monitoring protocols.

Any vegetation planted or seeded in the dunes or buffer areas on this property should be of locally native plants, with all propagules obtained from the project site or as close to the site as feasible. We observed that a neighbor's dune "enhancement" project that contained new plant material, trail, irrigation and lighting, which potentially included non-local plant species or genotypes; in particular, the Beach Primrose planted appeared to be of the northerly form, *Camissonia cheiranthifolia* ssp. *cheiranthifolia*, rather than the locally native form, *Camissonia cheiranthifolia* ssp. *suffruticosa*. If plants are grown for dune restoration, or if seeds are collected for dispersing on the subject property, care should be taken when collecting seeds for Beach Primrose.

## Read, E. 23 October 2006. Assessment of Historic and Current Biological Resources, 30732 Pacific Coast Highway (Broad Beach).

Read conducted an additional evaluation of the subject property to broaden the 1999 study and prepared an additional detailed report on the historic and current biological resources of the subject property in 2006. She evaluated historical topographic and photographic data, gathering additional field data including soil samples from multiple sites along transects in "dune, transitional, and non-dune habitats." Read concluded that the photographs she reviewed:

> . . . indicated that the dune features currently on the property derive from a combination of indigenous and artificial processes. An extensive coastal dune system was likely present historically across Broad Beach and the mouth of Trancas Creek, but by 1950 most of the historical dune system appears to have been eliminated by construction of PCH and early development of Broad Beach. The Broad Beach dune system was not reported as a major dune locality by the time Cooper published his review of California coastal dune communities in 1967.

She continued, however, "Regardless of origin, it is recognized that the dune habitat has biological values which could be enhanced." Read determined that the boundary between non-native weedy ruderal vegetation and current dune habitat is recognized by sharp differences in silt and clay content of the soil, depth to hardpan, and rodent activity.

Read recognized "no records of rare dune species for the project area" but, we have observed two special status species, Red Sand Verbena and Globose Dune Beetle, on the site, and a White-tailed Kite foraging on nearby properties.

Regarding the potential presence of Silvery Legless Lizard, a California Species of Special Concern, Read stated that, "due to numerous factors (limited extent of dune features on and off-site, previous disturbance, human activity, pets), legless lizards are likely absent." Also, "Presence of iceplant likely reduces the amount of moisture within dune features, which may render them unsuitable for this species. Removal of iceplant as part of the restoration plan will likely improve habitat potential of this species." Although we agree with the latter statement, Silvery Legless Lizards are known to occur in the presence of iceplants (e.g., at the dunes at Sandyland adjacent to Carpinteria Salt Marsh in Santa Barbara County), so we did not discount their potential to occur at Broad Beach. As noted in our report, herpetologist Justin Meyer of Glenn Lukos Associates conducted a focused survey for this species on the site in 2008 and found no legless lizards or evidence suggesting their potential presence. He will conduct a final survey for this species in March 2008.

Read determined that, "In general, the boundary between non-native, weedy ruderal vegetation and current dune habitat is recognized by sharp differences in silt and clay content of the soil, depth to hardpan, and rodent activity." This statement is generally true, although note that the non-dunal, non-ruderal area that we have classified as "primrose/lupine," which covers 0.1 acre on the site, has soils that are a mixture of sand and silt.

We suggest that the following is overstated: "Because natural processes of sand deposition from along-shore (tidal) and fluvial (stream) sources were eliminated many decades ago, it cannot be expected that the dunes can be fully restored to a completely natural dune ecosystem." Although modifications to Trancas Creek will greatly reduce this source of sediment to Broad Beach, and flood control actions are also reducing sediment loads farther up the coast, the presence of active foredunes that exhibit natural coastal processes demonstrate that sand deposition has not been eliminated. The question of whether a "completely natural" dune ecosystem can be restored on the site is largely semantic from an ecological standpoint. We believe that the dunal and non-dunal communities that lie south of the "stringline" can be restored/revegetated to a condition that closely resembles a natural state and that supports a variety of native plants and wildlife.

Section 30107.5 of the California Coastal Act provides the following criteria for an "Environmentally Sensitive Area:"

> Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

With these criteria in mind, we disagree with Read's opinion that the site's dune resources do not warrant recognition as ESHA on the basis of their intrinsic ecological values:

> Collectively, all available historical data, current field observations, and biological analysis of the dune features on the property indicate that while the dune fragments on the property have certain limited biological values that will be enhanced with implementation of the proposed restoration plan, they do not comprise a dune "ecosystem" consisting of natural processes of dune formation, mobility, and habitat succession within the meaning of the definition of ESHA. Native plant species currently occupying the dune fragments are common to coastal sandy soils in general and do not have a "special" nature or role. The dune fragments are also not "special" in the sense of supporting uncommon, rare, threatened, or endangered species. For all of these reasons it is concluded that biological evidence does not support qualification of the dune features as "ESHA" under Section 30107.5 of the California Coastal Act. It is only because the City of Malibu LCP/LIP requires that all dunes be categorized as ESHA, irrespective of their on-site values, that the term is used in this report.

The dunes on the project site are part of a more extensive coastal dune ecosystem on Broad Beach that is contiguous with the coastal wetland ecosystem of lower Trancas Creek and that is maintained by ongoing natural processes. Coastal dune ecosystems play a special role along California's coast, occurring in a very narrow band between the beach and the more widely distributed lowland communities. The native plants growing on the site's dunes play a special role in permitting the formation and maintenance of the site's coastal foredunes. Red Sand Verbena, in particular, can be said to have a special nature due to its placement on CNPS List 4.2. Coastal dunes support a variety of biologically sensitive plant and wildlife species, and dunes on the project site support at least one special status insect species, the Globose Dune Beetle. Coastal dunes can be easily disturbed or degraded by human activities and developments. For these reasons, we believe that the site's dunes satisfy the Coastal Act's criteria for ESHA.

We agree with Read's determination that the native species present, or likely to be present, on the site do not require large buffers for protection. We agree with Read that "measures will be necessary to address ongoing threats to dune habitat, which include trampling, disturbance by pets, and root expansion of exotic species (especially iceplant) used in landscaping." These types of issues are critically important on this site, which contains a relatively small fragment of a much larger dune ecosystem that is highly degraded and that is not being restored or properly managed. Toward achieving the conservation goals set in the LCP, we have recommended that the City of Malibu establish a standard land use policy regarding the Broad Beach dunes that is designed to restore and maintain over the long term their habitat values and biological integrity.

Read also stated that, "While future property owners should be encouraged to plant native species in landscaping, use of iceplant in landscaping is common practice in the coastal zone and total avoidance cannot be guaranteed." We believe that this issue would be best addressed by establishing a conservation easement over the on-site dunes and encouraging the City to establish policies aimed toward restoring and conserving the entire Broad Beach dune ecosystem.

## Rincon Consultants, Inc. 6 December 2006. Biological Resources Constraints Discussion, 30732 Pacific Coast Highway (Broad Beach), City of Malibu, Los Angeles County, California.

Julie Broughton, Nancy Fox-Fernandez, and Duane Vander Pluym, biologists for Rincon Consultants, Inc. (Rincon), discussed the environmental constraints they interpreted at the subject property. The following comments relate to those selected "constraints" with potential relevance to the proposed project.

Rincon noted that the project site lies within critical habitat for the federally threatened Western Snowy Plover. As reviewed in our report, Broad Beach dunes and adjacent beach are included in the plover's federally designated critical habitat, and the portion of Zuma Beach located north of Zuma Creek and south of Trancas Creek has been identified as the plover's single most important wintering site in Los Angeles County. We are unaware of any specific or documented sightings of Snowy Plovers from the strip of beach along the Broad Beach dunes, or from the dune habitat itself, and there is no indication that plovers regularly use the strip of beach along the Broad Beach dunes, or the dune habitat itself. The configuration of the site, with a thin strip of beach/dune habitat backed by houses, and the current use of the beach as a dog-walking and jogging site, would not make this site suitable for nesting plovers at this time, nor, apparently, for wintering plovers. With proper site management, however, we believe that it might be possible attract wintering plovers to the site. This potential is moderated by this species' tenacity in maintaining congregatory sites, such as Zuma Beach and the sandspit at Malibu Lagoon. Snowy Plovers return to, and may even attempt to winter or even breed at, these historical sites regardless of current human activity levels. Tolerance to people is most dramatically displayed at Malibu Lagoon, where the birds forage and roost near scores of beachgoers daily in late summer/fall.

With regard to the potential need for the USFWS to consult with other federal agencies under Section 7 of the federal Endangered Species Act, Rincon concluded that "No specific actions requiring federal permitting are known to be necessary for the proposed project." This conclusion was affirmed in a letter dated 13 February 2007 from Chris Dellith of the USFWS Ventura Field Office to M. Andriette Culbertson:

> We understand that no Federal nexus exists for this project. Critical habitat is only addressed when there is a Federal discretionary action; therefore, because there is no Federal nexus, we are not addressing the designated critical habitat.

We agree with Rincon that a presence/absence survey for the Sandy Beach Tiger should be conducted at the appropriate time of year. The presence of the Globose Dune Beetle and Ciliate Dune Beetle, both of which we have observed on the site, is evidence that the foredunes onsite are of sufficient quality to support coast-restricted terrestrial invertebrates. The preservation and restoration of the site's dunes, which would be implemented as part of the proposed project, could be beneficial to these and other native species. If the City takes our recommendation to recognize and manage the entire Broad Beach dune ESHA, these dunes could be made habitable by a wider range of native plants and wildlife.

Because our team found Globose Dune Beetles on the project site during the current surveys, assumptions about the presence or absence of this sensitive species no longer have to be made. We have seen that, even under the current degraded and disturbed site conditions, the beetle is able to survive in the foredune ecosystem at Broad Beach.

We agree with Rincon that the site's dunes are of "marginal quality" for the Silvery Legless Lizard. As noted in our report, herpetologist Justin Meyer of Glenn Lukos Associates conducted a focused survey for this species on the site in 2008 and found no legless lizards or evidence suggesting their potential presence. He will conduct a final survey for this species in March 2008.

Rincon discounted the potential for the Southern Steelhead to occur in Trancas Creek, located approximately 200 feet south of the project site, noting that the U.S. Fish and Wildlife Service did not designate this creek as critical habitat for the fish and stating that the proposed project "would not be expected to have any effect on the fish." The statement regarding critical habitat is true, and implementation of the proposed project with standard mitigation measures regarding water quality would ensure that any potential impacts to Southern Steelhead would be below a level of significance. As reviewed in our report, however, a recent status review for this fish in the Santa Monica Bay region concluded that, although the species has not been recorded in Trancas Creek since 2000, it probably occurred there historically. Therefore, while we agree with the overall conclusion that a properly designed project would be unlikely to entail any identifiable effects on the Southern Steelhead, the species' potential for future occurrence in lower Trancas Creek cannot be discounted entirely, especially if the estuary is restored.

Red Sand Verbena, a plant species placed on CNPS List 4.2, so should have been included in Rincon's discussion of sensitive plants.

We agree with Rincon that certain aspects of the proposed development and restoration plans could be improved upon to adequately mitigate potential impacts from the project on sensitive dune resources. Regarding their discussion of the number and location of trails to the beach, we recommend that the proposed four trails from the homes to the beach should be reduced to a maximum of two trails. These trails should be located in such as way to reduce fragmentation, total trail width, treading on vegetation, etc. Also, rather than a trail or footpath, a recycled plastic boardwalk has been used successfully elsewhere to direct people from developed areas through sensitive coastal habitats to the beach.

Rincon also discussed the adverse effects that dogs and cats can have on sensitive dune resources. We believe that such effects can be effectively mitigated by placing a conservation easement over the preserved/restored together with provision of interpretive signs that highlight and explain the sensitivity of the dunes and that advise against disturbance by humans or their pets. We further recommend that the City of Malibu consider developing resource conservation policies that would apply to the entire Broad Beach dune ecosystem.

## Forde, A. 11 December 2006. Letter to David Reznick, Malibu Bay Company.

Forde reiterated the point made by Rincon that, although the project site lies within designated critical habitat for the federally threatened Western Snowy Plover, consultation under Section 7 of the federal Endangered Species Act concerning critical habitat will not be required for this project since critical habitat is only addressed when there is a federal discretionary action (see the preceding discussion of the letter dated 13 February 2007 from Chris Dellith of the USFWS Ventura Field Office to M. Andriette Culbertson). Please note that USFWS letter refers to the need for plover surveys "prior to any restoration activities associated with dune disturbance" and the need to contact the USFWS if a plover is detected on the site to attain "the proper level of permitting . . . before work may resume." We also anticipate that potential effects of project implementation on the plover will need to be addressed through the CEQA and Coastal Act review processes.

Regarding the Silvery Legless Lizard, Forde conducted a survey of the subject property and found no evidence for the species' presence, and herpetologist Justin Meyer of Glenn Lukos Associates conducted a focused survey for this species on the site in 2008 and found no legless lizards or evidence suggesting their potential presence. He will conduct a final survey for this species in March 2008.

## Read, E. 18 December 2006. Letter to David Reznick, Malibu Bay Company. Subject: Rincon Consultants' Biological Constraints Discussion of MBC Property at 30732 Pacific Coast Highway.

Read stated in the first paragraph of her letter that Rincon's report did not change "interpretation of observations described in [her] previous reports . . . with respect to potential significance of project impacts on biological resources." We address this view

below. She also reiterated her "conclusion that restoration of the 'dune' feature on the property will increase in native habitat values." We agree that, with well-considered planning of the development and restoration components of this project, habitat values of the preserved portion of the project site can be expected to increase for native plants and wildlife, compared with the existing conditions.

Read focused her responses on three topics touched upon in Rincon's discussion of potential biological constraints to constructing four homes on this property. First, Read reiterated the point made by Rincon that, although the project site lies within designated critical habitat for the federally threatened Western Snowy Plover, consultation under Section 7 of the federal Endangered Species Act concerning critical habitat will not be required for this project since critical habitat is only addressed when there is a federal discretionary action (see the preceding discussion of the letter dated 13 February 2007 from Chris Dellith of the USFWS Ventura Field Office to M. Andriette Culbertson). As stated previously, we also anticipate that potential effects of project implementation on the plover will need to be addressed through the CEQA and Coastal Act review processes. Impacts to the beach and upper beach areas from the proposed project are likely to be minimal in relationship to the overall beach activities already present on the Broad Beach portion of the designated habitat.

Read restated her opinion that the information provided in biological reports completed at the time of Rincon's evaluation were sufficient to assess potential impacts from the proposed project:

> In summary, I find no evidence to warrant additional surveys for sensitive plant or wildlife species at this time. However, a final biological site survey, as mentioned above, at the appropriate time(s) of year prior to development of the site and implementation of the dune restoration plan would ensure that the sensitive species assessment is kept up-to date with respect to the timeline of project construction and dune restoration.

We have identified the presence of Globose Dune Beetles on the property and a White-tailed Kite nearby, and additional focused surveys will be undertaken for the Sandy Beach Tiger Beetle and Globose Dune Beetle. These surveys may not yield any additional information on the Western Snowy Plover, which could potentially occur on the site in fall or winter, but additional days of observation would be helpful in providing a more thorough body of evidence from which to describe the site's baseline biological conditions.

Regarding the discussion about Coulter's Salt Bush (*Atriplex coulteri*), Wayne Ferren of the ecological team is familiar with this species from field observations on Santa Cruz Island and at U.C. Santa Barbara. In each case, this rare herbaceous perennial grows in relatively open, indigenous, dense clay-soil on exposed bluffs. The location and land use history of the subject property suggest the site does not provide appropriate habitat for the species. Read agreed with Rincon that it is not "unreasonable" to consider reducing fragmentation of the foredune habitat by reducing the number of trails that traverse the dunes. She suggested reducing the number of proposed trails from four to two, noting that people walking to and from the beach through the site have been using the two major gaps that exist in the foredune ridge for many years. We support reducing the number of proposed

trails, and recommend considering the establishment of even just one trail, on an alignment that would minimize fragmentation of dune habitat. It is not clear to us at this time that maintaining both of the gaps in the foredune ridge would represent the most beneficial outcome in terms of the proposed restoration of the dune ecosystem. At any rate, there seems to be general agreement among the various parties that potential impacts to dune habitat could be reduced if the number of trails is minimized and the specific location of the trails is given careful consideration.

## Read, E. 30 May 2007. Dune Delineation Map.

We note that the dune delineation map provided to us with the date of May 30, 2007 is identical to the one prepared by Read and attached to her 1999 report and used in several subsequent reports except for the addition of the four units on the northern (landward) portion of the subject property. Please refer to the ecological team's review of Read (1999) report for additional information.

## Read, E. 30 July 2007. Assessment of the Extent of Coastal Foredunes at 30732 Pacific Coast Highway (Broad Beach): A Review of the Science.

In this report, Read posed and attempted to answer a number of questions regarding the "foredune complex" associated with the subject property, providing relevant discussion of the overall topic. Here we discuss some assertions made by Read in this document that are questioned by members of the ecological team.

Read argued that "the interruption in the sand supply brought about by the intervening development of Pacific Coast Highway and residential development has permanently and significantly interrupted sand supplies from Trancas Creek. The combination of these conditions renders the dunes a temporal and non-renewing resource." Given that Trancas Creek currently reaches the ocean southeast of the subject property, and given that the long-shore drift is likely down-coast in a southeasterly direction, most of Trancas Creek's sediment load would likely eventually move away from the subject property, not up-coast toward the property. We expect that sediment from up-coast sources contribute most of the sediment that becomes sand in the long-shore drift and dune formation processes. In any case, allowing that there may have been a larger dune complex associated with Broad Beach in the past, we see no clear evidence that sediment loads are now insufficient to form and maintain a dune ecosystem on the project site and adjacent properties. Psuty (2007:11) reviewed the same report by Read and reached a conclusion similar to that expressed by the ecological team:

> I agree with Dr. Read that the conditions of reduced sediment supply to the coastal foredune at this location will affect their subsequent development negatively, and will likely result in diminished extent of the foredune system. However, there is some sediment currently available and a foredune system could be supported, albeit at a scale less than what existed prior to cultural development in the past century.

Thus, the Broad Beach dune ecosystem should not be assumed to be withering or incapable of renewing itself due to insufficient inputs of fresh sediment, although the consensus view is that the dunes are unlikely to grow to be as large as they probably were in the distant past.

Read compared terminology that plant ecologists Barbour and Johnson (1988[1]) used to describe dune morphology with that used by Psuty (2004), and she cited Psuty (2004:16) in using the term "sandsheet/washover" area to describe the portion of the site located between the northerly ruderal area and the foredunes she delineated. This comparison and Read's interpretation of the term "sandsheet/washover" area were addressed by Psuty (2007:11):

> In Read (7/30/07), there is discussion about backdune or plain, and sandsheet/washover areas. She provides an interpretation about the use of these terms and their meaning from an ecological and a geomorphological perspective. She specifically applies my geomorphological classification of foredune terminology (Psuty, 2004) to that offered by Barbour and Johnson (1988). Unfortunately, this comparison is not appropriate. I use the concept of sandsheet/washover areas to apply to loci of abundant sand that constitutes an accumulation that may be reworked into subsequent morphologies. Barbour and Johnson (1988) appear to apply their term to a negative or erosional situation that results in topographical depressions. They are not the same; one is driven by the presence of additional sediment, the other by the absence of sediment input.

It is the opinion of the ecological team that the surface of the project site inland from the foredunes has been produced largely or entirely through human disturbances that probably include grading. The mixture of indigenous and non-indigenous substrates and the mixture of dune/sandy-soil species such as Beach Primrose with native and introduced ruderal species would not come about through entirely natural processes. It appears to us that the eolian transport of sand is continuing to transform the landscape of the southerly part of the site (i.e., areas mapped as Beach, Foredune, Mobile Hummock, and Stable Hummock) whereas the landscape to the north (i.e., areas mapped as Primrose/Lupine, Ruderal, and Developed) either is not being transformed or is doing so very slowly. This topic was addressed by Psuty (2007:12–13):

> The condition of future dunal topography is contingent on the integrity of the coastal foredune. The greater the coherence and integrity of the foredune, the lower the rate of inland transfer of sand and the slower the rate of inland dunal development. It is likely that the natural evolution of the coastal foredune and the associated dunal topography at inland positions are occurring at the centurial time scale. Human interference with the integrity of the coastal foredune will accelerate the process of inland dunal topographical development. Human regulation of the foredune-creating processes and resulting landforms should be directed to restoration and maintenance of the sediment availability and the continuity of the pioneer vegetation on the foredune ridge. With adequate protection of the processes of sedimentation inland of the upper beach, the foredune system will be preserved and the focus of conservation can be directed toward the seaward portion of the parcel. With an absence of enhancement and maintenance of the foredune system, the inland extent of eolian sediment transfer will increase and wider buffer zones will be required to preserve coastal dune morphologies.

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[1] Barbour, M.G., and Johnson, A. F. 1988. Beach and Dune. Chapter 7 in M.G. Barbour and J. Major (eds.) Terrestrial Vegetation of California. CNPS Special Publication 9. Second Printing.

We add only the cautionary note that, over the long term, impacts from an anticipated rise in sea level could have profound effects on the entire coast and coastal processes.

We agree with Read that the presence of one plant species does not indicate that a given area should be regarded as part of the "foredune complex." This is especially true for Beach Primrose, which Ferren has recorded on a coastal mesa in Santa Barbara County 100 feet above sea level. On the other hand, occurrence of Red Sand Verbena, a special status dune species, would likely be more significant because it is more restricted to dunes along the immediate shoreline. Whereas Red Sand Verbena is largely restricted to the foredunes at the subject property, Beach Primrose, as might be expected, occurs over a wider area inland from the foredune ridge. We agree with Read that the dunes on the project site are a small portion of a larger dune system on Broad Beach that have been degraded over the years by ongoing human activity. We disagree with Read, however, regarding the importance of the foredunes and the regional dune complex. Because Southern Foredunes are identified by the California Natural Diversity Database as a habitat of concern due to their rarity and vulnerability to disturbance, and because we have identified on the site special status plant and wildlife species characteristic of dunes, we believe that the dune ecosystem at Broad Beach has regional importance despite its degraded condition. Also, as Read noted:

> . . .the proposed restoration plan recognizes the remnant biological values on the property and in future could provide a foundation for more regional conservation and restoration efforts in conjunction with property owner cooperation.

Read also provided a review of relevant literature and gave examples of definitions of terms related to coastal dunes and the application of these terms to the subject property. She reviewed from her perspective the significance of vegetation in dune delineation; described foredune functions and values in historical and regional contexts; and stated some concluding remarks. Read gave some useful and interesting background information that provides important insight into the history and context of the coastal resources of Broad Beach, but we disagree with some of her conclusions about what this means regarding the subject property. Read made a case for the natural historical presence of dunes but suggested that, in light of changes to the natural coastal processes related to development of the coastline and historical impacts that took place at Broad Beach, "it is highly unlikely that the currently degraded dunes would support sensitive insect species." We know, however, that at least one sensitive insect species, the Globose Dune Beetle, does occur there. We do agree with Read that "the remnant biological values of the dunes could be protected and enhanced."

Read concluded this report by revisiting and restating her earlier judgment that the site's dunes fail to satisfy criteria for ESHA set forth in Section 30107.5 of the California Coastal Act. For reasons explained previously, we do not agree with this assessment. We believe that she is correct, however, in stating, "Future management challenges, outside of the control of the property owner, will include erosive effects of wave action, public/domestic animal intrusion into the protected site, and invasive species." As discussed previously, we believe a well-designed and comprehensive program for the entire Broad Beach dune ecosystem, preferably administered by the City, may be necessary to address some of these challenges and to ensure a successful foredune restoration program.