

***BOTANICAL REPORT  
PROPOSED KAPA‘A TO AHIHI POINT BICYCLE PATH  
ISLAND OF KAUA‘I***

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*General Site Description*

The project site is an approximately 4.3-mile long, winding path that borders the shoreline on the windward side of Kaua‘i. The southern portion is basically urban, as the path is paved and divides a landscaped park from homes, commercial and resort property. The middle portion (from Kapa‘a to Kealia Beach) passes first through undeveloped land with natural scenic values and then a beach park. The northern portion (from Kealia Beach to Ahihi Point) is situated between wild, natural shoreline and the just-developing Kealia-Kai subdivision. The bike path is already in use by bicycles, pedestrians and motorcyclists.

*Vegetation Dynamics*

The elevation of the path remains within a few dozen feet of sea level, and mean annual rainfall is approximately 50 inches. The original natural vegetation of this coastal area can be classified as Coastal Dry Shrubland, per Gagne and Cuddihy (1990), consisting of scattered herbs, grasses, vines, shrubs and trees that are mostly indigenous but not endemic to Hawai‘i. The vegetation of this part of Kaua‘i has been altered in places by disturbance such as grading, construction and dumping, and more fundamentally changed by alien species invasion.

*Botanical Survey*

A botanical survey of the project site was conducted on July 27, 2002. The purpose of the survey was to identify any state or federally listed threatened or endangered plant species growing on or near the project site, and to summarize the populations of native and introduced plant species.

A corridor about 20 meters wide flanking the existing path was surveyed. In certain locations, wider areas were surveyed:

- The public access from the highway to Donkey Beach;
- All of Waipoli Park, at the south end of the path;
- A wider corridor on the point overlooking Kealia Beach to the south;
- Large sections of the shoreline area makai of the path between Kealia Beach and Donkey Beach; and
- The entire Ahihi Point area, from the mauka-makai footpath divergence south of the stream, through the stream area to the point, and along the path towards the bay to the north.

All species within the 20 m corridor were recorded. In the other areas, all native species as well as some alien species were recorded, as many landscaped plants and assorted weeds were present as well. A total of 78 plant species were recorded (Table 1).

**Table 1**  
**Plant Species on Project Site**

| <b>Scientific Name</b>                      | <b>Family</b>    | <b>Common Name</b>   | <b>Life Form</b> | <b>Status</b> |
|---|------------------|----------------------|------------------|---------------|
| <i>Abutilon grandifolium</i>                | Malvaceae        | Hairy abutilon       | Herb             | A             |
| <i>Acalypha</i> sp.                         | Euphorbiaceae    | Acalypha             | Shrub            | A             |
| <i>Alternanthera pungens</i>                | Amaranthaceae    | Khaki weed           | Herb             | A             |
| <i>Alysicarpus vaginalis</i>                | Fabaceae         | Alysicarpus          | Herb             | A             |
| <i>Antigonon leptopus</i>                   | Polygonaceae     | Mexican creeper      | Vine             | A             |
| <i>Asystasia gangetica</i>                  | Acanthaceae      | Chinese violet       | Vine             | A             |
| <i>Atriplex semibaccata</i>                 | Chenopodiaceae   | Australian saltbush  | Shrub            | A             |
| <i>Bacopa monnieri</i>                      | Scrophulariaceae | Water hyssop         | Herb             | I             |
| <i>Boerhavia coccinea</i>                   | Nyctaginaceae    | None                 | Herb             | A             |
| <i>Boerhavia repens</i>                     | Nyctaginaceae    | Alena                | Herb             | I             |
| <i>Brachiaria mutica</i>                    | Poaceae          | California grass     | Grass            | A             |
| <i>Calotropis gigantea</i>                  | Asclepiadaceae   | Crown flower         | Shrub            | A             |
| <i>Canavalia cathartica</i>                 | Fabaceae         | Mauna loa            | Vine             | A             |
| <i>Canavalia sericea</i>                    | Fabaceae         | Silky jack bean      | Vine             | A             |
| <i>Casuarina equisetifolia</i>              | Casuarinaceae    | Iron wood            | Tree             | A             |
| <i>Chamaesyce hirta</i>                     | Euphorbiaceae    | Garden spurge        | Herb             | A             |
| <i>Chamaesyce hypericifolia</i>             | Euphorbiaceae    | Graceful spurge      | Herb             | A             |
| <i>Chloris barbata</i>                      | Poaceae          | Swollen finger grass | Grass            | A             |
| <i>Coccoloba uvifera</i>                    | Polygonaceae     | Sea grape            | Tree             | A             |
| <i>Cocos nucifera</i>                       | Arecaceae        | Coconut              | Tree             | A             |
| <i>Commelina diffusa</i>                    | Commelinaceae    | Honohono             | Herb             | A             |
| <i>Conyza bonariensis</i>                   | Asteraceae       | Hairy horseweed      | Herb             | A             |
| <i>Cordia subcordata</i>                    | Boraginaceae     | Kou                  | Tree             | A             |
| <i>Crotalaria</i> sp.                       | Fabaceae         | Rattlepod            | Herb             | A             |
| <i>Cynodon dactylon</i>                     | Poaceae          | Bermuda grass        | Grass            | A             |
| <i>Cyperus latifolia</i>                    | Cyperaceae       | Umbrella grass       | Sedge            | A             |
| <i>Desmanthus virgatus</i>                  | Fabaceae         | Slender mimosa       | Shrub            | A             |
| <i>Eleusine indica</i>                      | Poaceae          | Goose grass          | Grass            | A             |
| <i>Ficus macrophylla</i>                    | Moraceae         | Large-leaf fig       | Tree             | A             |
| <i>Heliotropium curassavicum</i>            | Boraginaceae     | Seaside heliotrope   | Herb             | I             |
| <i>Hibiscus tiliaceus</i>                   | Malvaceae        | Hau                  | Tree             | I             |
| <i>Ipomoea imperati</i>                     | Convolvulaceae   | Hunakai              | Vine             | I             |
| <i>Ipomoea obscura</i>                      | Convolvulaceae   | Koali ai             | Vine             | A             |
| <i>Ipomoea pes-caprae</i>                   | Convolvulaceae   | Pohuehue             | Vine             | I             |
| <i>Jacquemontia ovalifolia sandwicensis</i> | Convolvulaceae   | Pa'u-o-hi'iaka       | Vine             | E             |
| <i>Lantana camara</i>                       | Verbenaceae      | Lantana              | Shrub            | A             |
| <i>Leucaena leucocephala</i>                | Fabaceae         | Haole koa            | Tree             | A             |
| <i>Lycium sandwicensis</i>                  | Solanaceae       | 'Ohelo kai           | Herb             | I             |
| <i>Macroptilium lathyroides</i>             | Fabaceae         | Cow pea              | Vine             | A             |
| <i>Malvastrum coromandelianum</i>           | Malvaceae        | False mallow         | Shrub            | A             |
| <i>Medicago polymorpha</i>                  | Fabaceae         | Bur clover           | Herb             | A             |
| <i>Mimosa pudica</i>                        | Fabaceae         | Sensitive plant      | Herb             | A             |
| <i>Morinda citrifolia</i>                   | Moraceae         | Noni                 | Tree             | A             |

A = alien, E = endemic, I = indigenous, End = Federal and State listed Endangered Species

**Table 1, Continued**

|                                   |                |                          |       |   |
|-----------------------------------|----------------|--------------------------|-------|---|
| <i>Musa x paradisiaca</i>         | Musaceae       | Banana                   | Tree  | A |
| <i>Pandanus tectorius</i>         | Pandanaceae    | Hala                     | Tree  | I |
| <i>Panicum maximum</i>            | Poaceae        | Guinea grass             | Grass | A |
| <i>Phyllanthus debilis</i>        | Euphorbiaceae  | Phyllanthus              | Herb  | A |
| <i>Pistia stratioides</i>         | Araceae        | Water lettuce            | Herb  | A |
| <i>Plantago major</i>             | Plantaginaceae | Broad-leaved<br>plantain | Herb  | A |
| <i>Pluchea carolinensis</i>       | Asteraceae     | Sourbush                 | Shrub | A |
| <i>Pluchea indica</i>             | Asteraceae     | Indian pluchea           | Shrub | A |
| <i>Portulaca oleracea</i>         | Portulacaceae  | Pig weed                 | Herb  | A |
| <i>Portulaca pilosa</i>           | Portulacaceae  | None                     | Herb  | A |
| <i>Prosopis pallida</i>           | Fabaceae       | Keawe                    | Tree  | A |
| <i>Rhizophora mangle</i>          | Rhizophoraceae | Red Mangrove             | Tree  | A |
| <i>Ricinus communis</i>           | Euphorbiaceae  | Castor bean              | Tree  | A |
| <i>Scaevola taccada</i>           | Goodeniaceae   | Naupaka kuahiwi          | Shrub | I |
| <i>Schinus terebinthifolius</i>   | Anacardiaceae  | Christmasberry           | Shrub | A |
| <i>Senna</i> sp.                  | Fabaceae       | Senna                    | Shrub | A |
| <i>Sesuvium portulacastrum</i>    | Aizoaceae      | 'Akulikuli               | Herb  | I |
| <i>Sida fallax</i>                | Malvaceae      | 'Ilima                   | Shrub | I |
| <i>Solanum americanum</i>         | Solanaceae     | Popolo                   | Shrub | I |
| <i>Sonchus oleraceus</i>          | Asteraceae     | Sow thistle              | Herb  | A |
| <i>Sporobolus virginicus</i>      | Poaceae        | 'Aki'aki                 | Grass | I |
| <i>Stachytarpheta jamaicensis</i> | Verbenaceae    | Jamaica vervain          | Shrub | A |
| <i>Syzygium cumini</i>            | Myrtaceae      | Java plum                | Tree  | A |
| <i>Terminalia catappa</i>         | Combretaceae   | Tropical almond          | Tree  | A |
| <i>Tetragonia tetragonioides</i>  | Aizoaceae      | New Zealand<br>Spinach   | Herb  | A |
| <i>Thespesia populnea</i>         | Malvaceae      | Milo                     | Tree  | I |
| <i>Tournefortia argentia</i>      | Boraginaceae   | Tree heliotrope          | Tree  | A |
| <i>Vigna marina</i>               | Fabaceae       | Nanea                    | Vine  | I |
| <i>Vitex rotundifolia</i>         | Verbenaceae    | Pohinahina               | Shrub | I |
| <i>Vitex trifolia</i>             | Verbenaceae    | Pohinahina               | Shrub | I |
| <i>Waltheria indica</i>           | Sterculiaceae  | 'Uhaloa                  | Herb  | I |
| <i>Wedelia trilobata</i>          | Asteraceae     | Wedelia                  | Shrub | A |
| <i>Yucca</i> sp.                  | Agavaceae      | Yucca                    | Tree  | A |

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### *Vegetation of the Project Site*

The vegetation flanking the bike path consists of remnant, and in some areas post-disturbance successional, strand and coastal communities. The presence of alien species ranges from negligible to dominant. In terms of cover percentage, the most prominent native components are herbs, grasses and vines, including *Ipomoea pes-caprae* (beach morning glory or pohuehue), *Jacquemontia ovalifolia sandwicensis* (pa'u-o-hi'iaka, an endemic subspecies), *Boerhavia repens* (alena), *Scaevola taccada* (naupaka), *Sesuvium portulacastrum* ('akulikuli), *Vitex rotundifolia* (pohinahina), *Sida fallax* (ilima), *Sporobolus virginicus* ('aki'aki grass). Somewhat less common but either widely scattered or prominent in certain locations are *Heliotropium curassavicum* (seaside heliotrope), *Ipomoea imperati* (hunakai), *Waltheria indica* ('uhaloa), and *Vigna marina* (nanea).

Large shrubs and trees are not present directly adjacent to the bike path for much of its length, but are usually found close by. *Tournefortia argentea*, the alien tree heliotrope, very common on shores throughout Hawai‘i, is the most common tree, followed by the indigenous milo (*Thespesia populnea*) and hau (*Hibiscus tiliaceus*). .

Along its entire length, areas flanking the bike path are well endowed with a diverse range of native species. The point overlooking Kealia Beach from the south and the makai slopes of the path between Kealia Beach and Donkey Beach offer particularly good native assemblages in terms of either purity or diversity.

### *Threatened or Endangered Plant Species*

No proposed or listed threatened or endangered species were observed during the botanical survey. Although it bears noting that even careful survey may miss cryptic species, seedlings, and stressed or obscured plants, based on its setting and the results of this survey, the project site is not likely to contain any significant population of threatened or endangered plant species.

### *Impacts and Mitigation Measures*

The remnant strand and coastal plant communities, although not uncommon, have conservation value for preserving native species and communities, for preventing erosion and sedimentation of adjacent areas, and for conservation education. We have the following recommendations to minimize adverse impacts and maximize the potential conservation benefit of the path:

- The improved bike path should be located along the same alignment as the current path to the greatest degree practical.
- The path offers excellent interpretation opportunities for native plant education. In the interest of preserving the biota in the area and fostering interest in native plants in general, we recommend that educational signs be installed and maintained.
- During construction, care should be taken to restrict the footprint of construction to the minimum area necessary and repair any damage to native plant communities.
- A landscaping plan should be prepared by parties knowledgeable in native plants and conservation biology, and it should incorporate primary native species and avoid using any alien plants that have potential to naturalize in the area.

### **References**

Gagne, W., and L. Cuddihy. 1990. "Vegetation," pp. 45-114 in W.L. Wagner, D.R. Herbst, and S.H. Sohmer, eds., *Manual of the Flowering Plants of Hawaii*. 2 vols. Honolulu: University of Hawaii Press.



