

CHAR & ASSOCIATES

Botanical/Environmental Consultants

4471 Puu Panini Ave.
Honolulu, Hawaii 96816
(808) 734-7528

09 February 1989

ORIGINAL

Mr. Edwin Y. Kuniyoshi
BELT COLLINS & ASSOCIATES
680 Ala Moana Blvd., Suite 200
Honolulu, Hawaii 96813

Dear Mr. Kuniyoshi:

SUBJECT: Botanical Assessment Report
Additional Sites -- Lihue/Puhi Master
Plan Project, Lihue, Kaua'i

In September 1988, a botanical survey of the ±400-acre Lihue/Puhi project site was conducted by Char & Associates. Later the boundaries of the project site were expanded in certain areas. During the earlier study the field survey had included all those areas where a shot would cross over a gulch, the landfill site, and the gulch adjacent to the plant nursery. Thus, of the "new" areas added to the project site, only four were not surveyed during the earlier study.

A survey of these four additional sites was made on February 04, 1989 and the findings from that survey are summarized below. The primary objectives of the study were to provide a general description of the vegetation and to search for threatened and endangered plant species protected by federal and/or state endangered species laws.

DESCRIPTION OF THE VEGETATION

Site 1 -- This 3-acre site, Parcel "1" on the master plan map, is located mauka of Kaunuali'i Highway and immediately west of the Kaua'i Community College campus. It is part of the plantation housing system although most of the homes are now gone. Vacant lots are overgrown with California grass (Brachiaria mutica), Vasey grass (Paspalum urvillei), sour grass (Digitaria isularis), and Guinea grass (Panicum maximum). Scattered large trees left standing after the houses were removed include tamarind

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(Tamarindus indica), mango (Mangifera indica), monkeypod (Samanea saman), and African tulip (Spathodea campanulata). Rows of young coconut (Cocos nucifera) line some roads; these plants are to be used for future landscaping.

No surveys were made of the lots which were occupied as these are regularly maintained and would not support any natural native plant communities.

Site 2 -- This is a portion of Parcel "6" on the master plan map. It lies on the slopes of a gulch which is a side branch of the larger Halehaka Gulch. A small stream flows along the bottom of this smaller gulch. The site was once used for grazing, probably cattle, and there is an old fenceline between the cane fields and the gulch. Vegetation consists of a mixed shrubland. In some areas, guava (Psidium guajava) and Christmas berry (Schinus terebinthifolius) are abundant and the shrubland is dense. Locally common in this type of shrubland is hau (Hibiscus tiliaceus). Scattered, mixed stands of trees such as bingabing (Macaranga tanarius), Javaplum (Syzygium cumini), and octopus tree (Schefflera actinophylla) are occasional here.

Where the side gulch meets the Halehaka Gulch, there is a large, rather open shrubland composed primarily of lantana (Lantana camara) with scattered guava shrubs. Plant species commonly associated with such pasture lands are abundant. These include grasses such as Hilo grass (Paspalum conjugatum), Vasey grass, Guinea grass, Bermuda grass (Cynodon dactylon), swollen finger grass (Chloris barbata), Glenwood grass (Sacciolepis indica), foxtail (Setaria gracilis), West Indian dropseed (Sporobolus indicus), and crabgrass (Digitaria setigera). Also common are shrubs and herbaceous species as three species of Senna (S. alata, S. pendula, S. occidentalis), two Spanish clover species (Desmodium incanum, D. sandwicense), sensitive plant or

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pua-hilahila (Mimosa pudica), rattlepod (Crotalaria pallida), and hairy horseweed (Conyza bonariensis).

Site 3 -- This site lies adjacent to an actively used cane haul road behind Puhī town and an irrigation ditch. Most of the residents adjacent to this site have used the area for vegetable gardens or as an extension of their back yards. Rows of banana (Musa hybrida), coconut trees, pigeon pea or gonduli bean (Caianus caian), and mango are a common sight. Where the site has not been maintained, it is overgrown with California grass, koa-haole (Leucaena leucocephala), Guinea grass, and, adjacent to the ditch, honehono (Commelina diffusa).

Site 4 -- This site is located on the upper slopes of Halehaka Gulch, a part of Parcel "16" on the master plan map. Vegetation consists of a forest composed primarily of Javaplum with scattered trees of ironwood (Casuarina equisetifolia), swamp mahogany (Eucalyptus robusta), octopus tree, bingabing, and satin leaf (Chrysophyllum oliviforme). Under the rather dense forest cover, the ground below is covered with leaf litter and fallen branches. Seedlings and saplings of the tree species mentioned above can also be found, usually in areas where the sunlight can reach the forest floor below.

Along the edges of the forest, where it borders the cane fields, and where there is more light, the vegetation is dense. Here, one can find Christmas berry and lantana shrubs, Guinea grass, and several species of vines -- passion fruit or liliko'i (Passiflora edulis), hushue-haole (Passiflora suberosa), yellow water-lemon or lilivai (Passiflora laurifolia), white thunbergia (Thunbergia fragrans), and mauna-loa (Canavalia cathartica).

The mixed forest is the most common vegetation type in gulch

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areas throughout the project site.

DISCUSSION

The addition of these other sites will not have a significant negative impact on the total island populations of the species involved. The vegetation is dominated by introduced or alien species, many of them weedy. The few native or presumed native species, such as hau, are found in similar environmental habitats throughout the Hawaiian Islands and elsewhere in the Pacific.

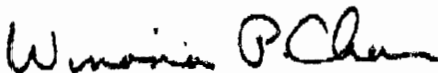
No officially listed threatened or endangered plants occur on the site. Nor are any species proposed or candidate for such status. The earlier botanical survey also reported similar findings.

Of some concern, is the generation of sediments into the streams below. It is recommended that sloping areas be replanted as soon as possible after construction activities.

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Thank you for this opportunity to assist Belt Collins & Associates in the planning for this project. Should you have any questions regarding the report, please do not hesitate to contact us.

Sincerely,



Winona P. Char
Principal