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A partial list of the plants of the Midway Islands

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The Midway Islands, 1,300 statute miles northwesterly from Honolulu and only 56 miles southeast of Ocean Island, the end of the Leeward chain, are known to tens of thousands of Americans. Sand Island, the larger of the two, was an operating base for Pan-American Airways from 1935 to 1950. It has been an east-bound refueling stop for Armed Forces transport planes since the end of World War II. During one stage of the hostilities the 1,282 acres of the two islands held more than 15,000 fighting men, their equipment, housing, shops and warehouses. Sand Island, too, has long been an active U. S. Navy base.

The Midway Islands were discovered in 1859 when Captain W. C. Brooks took possession of them from the U. S. Government. Being very near the exact center of the north Pacific they were termed the Midway Islands, or just Midway. Eastern Island, the older of the two geologically, covers 334 acres and is composed of broken coral, shells and coarse sand. Sand Island, 948 acres, is made up largely of white coral sand. Except for a survey in 1867 by personnel from the U.S.S. Lackawanna, only shipwrecked sailors saw these islands until the Rothschild Expedition visited them in 1891.

Eastern Island has been somewhat vegetated for a much longer period than Sand Island. Photographs taken in 1891 by members of the Rothschild Expedition show fairly dense grass, some Boerhavia and extensive low Scaevola bushes on Eastern, but only a few Scaevola and a few Boerhavia vines on Sand Island.

When the Commercial Pacific Cable Company came to Sand Island in 1902 the island was described as a level waste of glaring white sand with only a few bunches of grass, a few Boerhavia vines and one or two small Scaevola bushes. In 1907 the company planted hundreds of ironwoods, Casuarina, and San Francisco grass, Ammophila, around their compound. Within a few years the trees were large enough to protect the northern end of the island from the winter storms and the Scaevola, Boerhavia and Ammophila began to spread. By the beginning of World War II some of the original ironwoods were 70 feet tall and natural re-seeding had spread them over most of Sand Island and even onto Eastern Island.

In the years that followed the original plantings, other plants were introduced, largely close to the Cable Company buildings on the north end of the island. When Pan-American Airways set up their operating base on Sand Island in 1935, a number of plants, largely from Hawaii, were set out near their Gooneyville Lodge. According to Hadden, who was their unofficial gardener from 1936 to 1941, over 200 species of plants were tested on this island. Some of the ornamentals now growing about the residential area of the island were listed in his report of successful introductions, and many of the ornamentals planted about Gooneyville Lodge are still thriving.

During the intervening years, new introductions have occurred as seeds were introduced in packing materials, and as flowers or shrubs were

brought in by resident Navy personnel. We find no record of actual plantings on Eastern Island, but either through man or natural means a number of the plants found on Sand Island are now established on Eastern; in some instances their smaller size indicates their relative youthfulness in this location.

In the autumn of 1954 the authors were assigned by the U. S. Fish and Wildlife Service to study bird problems on the Midway Islands, and were there from November 6 to December 5. Enroute to the islands, while conferring with Mr. E. H. Bryan, Jr., of the Bishop Museum in Honolulu, we learned that the Museum herbarium lacked specimens of many plants known to be growing on Midway. It seemed small repayment for Mr. Bryan's many courtesies that we attempt to add to the Museum's Midway herbarium.

Our objective concerned the bird life of the islands, and plant collecting was entirely a side-line. Plants were picked up during the course of other work so a complete collection was not attempted. We did not search the residential area for flowering plants, nor did we collect specimens of a number of larger ornamentals such as banana, coconut and banyan. At the end of our stay we had transmitted to the Bishop Museum specimens of 48 species of plants. Duplicate specimens of 46 of these were placed in the herbarium of the Wildlife Research Laboratory in Denver. Plant identifications were made by Marie C. Neal of the Museum.

In suggesting a modernized report on the plants of the Midway Islands Dr. Fosberg generously contributed his own notes covering observations made on Sand Island on February 13, 1954. He further abstracted information from two earlier lists of Midway plants (1931, 1935) and furnished a list of principal references on Midway plants.

Neither we nor Dr. Fosberg saw any specimens of a considerable number of the plants listed by these earlier writers. Ecological conditions have changed greatly on the Midway Islands since 1940 when defense preparations were put into high gear there. Some of the earlier species may have passed from the picture, or may now be so restricted in their distribution that we did not encounter them. There has been little attention to gardening on Sand Island since Hadden left there in 1941. Soon after Pearl Harbor military activity on the two islands literally changed the face of the landscape. Bulldozers cleared off the brush and miles of hard-surfaced runways were built. Bulldozers also threw up hundreds of yards of sand revetments and cleared plane parking behind them. Literally hundreds of buildings were scattered all over both islands. Though many of the latter are now falling down, and though Scaevola bush has covered the top of most of the revetments, the mark of wartime activity on the plant ecology of these islands remains clearly visible.

On Eastern Island, slightly more than 100 acres are in runways, buildings, and plane parking strips, to say nothing of the great area of revetments. On Sand Island, more than 200 acres are occupied by the runways, plane parkings, roads, tumbledown wartime buildings, and the residential and administrative area of the active Naval base. Bulldozed areas of ironwoods, Scaevola and other plants that had spread from Cable Company and Pan-American plantings, have in large part been replaced by

apparent later introductions, many of them weed plants.

In the following report of plants that have grown or are now growing on Midway it has been necessary to make use of a series of symbols. C. & C. refers to plants reported by Christophersen and Caum in 1931. St. J. refers to plants listed by St. John in 1935. The symbol FWS refers to observations made by the authors, and FWS-C to those species where specimens were collected by us. FRF refers to plants observed by Dr. Fosberg on February 13, 1954. Comments made are necessarily general, mostly based on our own observations and such notes and records as we made.

Since it is necessary that in such a paper there be but one taxonomic standard, we have followed Dr. Fosberg's recommendations on such matters wherever questions arose. Without the generous assistance of Dr. Fosberg, Mr. E. H. Bryan and Miss Marie Neal of the Bishop Museum, neither this paper nor the collection upon which it is largely based would have been prepared.

Psilotum nudum (L.) Griseb.
C. & C.

Araucaria excelsa R. Br. Norfolk Island pine.
FWS. A few fine specimens are growing in the old Cable Company compound area and on the lawns of a few of the officers' quarters, Sand Island.

Pandanus tectorius Park. Screwpine; Hala.
FWS. Occasional specimens occur in the administrative and residential area, two of them at the Administration Building. One was seen in the Scaevola scrub near the south end of Sand Island.

Ammophila arenaria (L.) Link San Francisco grass
C. & C. The planting of San Francisco grass as a soil binder by the Cable Company is reported in every description of the flora of Sand Island. Late in our stay the senior author had not found any grass that seemed to be this species, and spent a number of hours looking for new types; several were collected, but none turned out to be Ammophila.

Cenchrus agrimonoides var. laysanensis F. Br.
C. & C.

Cenchrus echinatus L. Sand bur.
C. & C.; FRF; FWS-C. Locally common, found mostly along the edges of runways, roads and about the larger buildings on Sand and Eastern Islands.

Chloris inflata Link
FRF. FWS-C. Locally common in open spaces on Sand and Eastern Islands.

- Cynodon dactylon (L.) Pers. Bermuda grass.
FRF; FWS-C. Abundant. The common lawn grass and spread over much of Sand Island. Locally common on Eastern Island. Now the best sand-binder growing on the islands.
- Digitaria ciliaris (Retz.) Koel. Crab grass.
FRF. Dr. Fosberg calls it rare in open sandy areas on Sand Island.
- Eleusine indica (L.) Gaertn. Goose grass.
FRF; FWS-C. Locally common, scattered about in open spaces on both Sand and Eastern Islands.
- Eragrostis amabilis (L.) W. & A. Love grass.
FRF, FWS-C. Locally common in open spaces on Sand Island. Was not noted on Eastern Island.
- Eragrostis variabilis (Gaud.) Steud.
C. & C.; FWS-C. Rare. Found in only two places on Sand Island, one of them a large patch near the terminal.
- Eragrostis whitneyi var. caumii Fosberg
C. & C.; FWS-C. Fairly abundant on parts of Sand Island, locally common on Eastern Island. Found growing along edges of runways, and in cracks in runways and plane parking stands.
- Lepturus repens (Forst.) R. Br.
C. & C.
- Panicum purpurascens Raddi Para grass.
FWS-C. Occasional; found in only two areas on Sand Island, under the ironwoods near the Cable Company compound.
- Rhynchelytrum roseum (Nees) Stapf and Hubb. Natal redtop.
FWS-C. Rare, found in only two or three small areas on the older, undisturbed part of Sand Island.
- Setaria verticillata (L.) Beauv.
FWS-C. Locally abundant in open spaces on both Sand and Eastern Islands.
- Sporobolus virginicus (L.) Kunth
St. J.
- Stenotaphrum secundatum (L.) O. Ktze. Buffalo grass.
FRF; FWS-C. Occasional, in open spots in the older vegetated section of Sand Island.
- Cyperus alternifolia L. Umbrella plant.
FRF; FWS-C. Two or three densely grown clumps were seen under old ironwoods near the Cable Company compound, a few small plantings about residences, on Sand Island only.

Cyperus javanicus Houtt.
St. J.

Cyperus rotundus L. Nut grass.
FRF; FWS-C. Found locally abundant on both Sand and Eastern Islands, mostly along the margins of runways, along edges of paved roads, and near foundations of larger buildings where run-off of rainfall apparently controls its distribution.

Fimbristylis cymosa R. Br.
FWS-C. Locally common in same general locations as the last, but more restricted in distribution, on both Sand and Eastern Islands.

Cocos nucifera L. Coconut.
FWS. Planted originally by the Cable Company and later by Pan-American, the coconut palms seem to be doing well; on Sand Island only.

Phoenix sp.
FWS. A number of palms of the Phoenix type are to be found on Sand Island among the Cable Company and Pan-American plantings, and on lawns of a few residences.

Commelina diffusa Burm. f. Day flower.
St. J.

Crinum sp.
FRF; FWS. Occasional fine specimens of "spider lilies" may be seen on Sand Island on the lawns of residences and about administrative buildings.

Agave sp. Century plant.
FWS. Occasional plants locally called sisal occur on Sand Island in the residential and administrative area.

Musa sp.
FWS. Some few banana plants were found on Sand Island in the older area near the Cable Company and Pan-American buildings, and an occasional one as an ornamental about a residence. They appear to be surviving but not thriving.

Casuarina equisetifolia L. Ironwood.
FRF; FWS-C. Abundant on both Sand and Eastern Islands. The original plantings appear to have reached maturity and some are dying. Spreading by natural means the ironwoods have scattered all over Sand Island and trees dully 30 feet high were seen on beach-line dunes on the opposite end of the island from the original plantings. A few trees of similar height were found on Eastern Island and small seedlings occur almost all over this island. Within a few years it, too, will very likely be ironwood-covered.

Morus alba L. ? Mulberry.
FRF. Reported by Hadden as growing here; we did not find it but Fosberg located one unhealthy-looking specimen growing in an opening in the scrub on Sand Island.

Ficus retusa L.

Chinese banyan.

FWS. A number of banyans of varying size appear to be doing well about the old Cable Company area and about Pan-American's deserted Gooneyville Lodge, on Sand Island.

Coccoloba uvifera (L.) Jacq.

Sea grape.

FRF; FWS-C. Not uncommon, single trees growing widely scattered over both Sand and Eastern Islands.

Achyranthes splendens var. reflexa Hbd.

C. & C.

Boerhavia diffusa var. tetrandra (Forst.) Heimerl

C. & C.; FRF; FWS-C. Common trailing vine found in much of the open or very slightly shaded sandy area of both Sand and Eastern Islands.

Bougainvillea sp.

Bougainvillea.

FWS. A few very nice vines noted growing on residential porches on Sand Island.

Portulaca lutea Sol.

C. & C.

Portulaca oleracea L.

Purslane.

FWS-C; FRF. Locally abundant, widespread in open sandy areas on both Sand and Eastern Islands.

Capparis sandwichiana DC.

C. & C.

Lepidium o-waihiense C. & S.

C. & C.

Lepidium virginicum L.

Pepper-grass.

FWS-C. Rare, only two or three plants noted on each of the islands.

Lobularia maritima (L.) Desv.

Sweet alyssum.

FRF; FWS. Sweet alyssum grows in abundance over large portions of both Sand and Eastern Islands.

Desmodium uncinatum (Jacq.) DC.

St. J.

Medicago lupulina L.

Nonesuch.

FRF; FWS. Fosberg found it growing as an escapee from a lawn. We found a few specimens about the residential area, on Sand Island.

Trifolium sp.

St. J.

- Crotalaria incana L. Rattle-pod.
FWS-C. Only two or three plants were seen growing on each of the islands.
- Crotalaria mucronata Desv. Rattle-pod.
St. J.
- Leucaena glauca (L.) Benth. Koa haole.
FWS-C. The only plant seen was growing on the lawn of the Administration Building on Sand Island.
- Acacia farnesiana (L.) Willd. Klu.
St. J.; FWS-C. Found as a planted ornamental in some places on Sand Island. One small wild spot has grown up near the enlisted men's residential area.
- Albizia lebeck (L.) Benth. Woman's tongue.
FWS-C. Found as an ornamental and in a few scattered small wild patches about the older part of Sand Island.
- Oxalis corniculata L. Sorrel.
FWS-C. Occasional, scattered about on both Sand and Eastern Islands.
- Tribulus cistoides L.
C. & C.; FWS-C. Locally abundant trailing ground cover on sandy areas on both Sand and Eastern Islands.
- Murraya paniculata (L.) Jack Mock orange.
FWS-C. Seen only as a planted hedge in the residential area on Sand Island.
- Euphorbia geniculata Ort. Spurge.
St. J.
- Euphorbia heterophylla L. Wild poinsettia.
FRF; FWS-C. Abundant on Sand Island, common as an understory among the thinner stands of ironwoods and as dense marginal growth about the edges of thick stands. Also present on Eastern Island.
- Euphorbia hirta L. Spurge.
St. J.; FRF; FWS-C. Occasional or locally common. Most frequently seen in open sandy utility areas where the soil has been disturbed during recent years.
- Euphorbia prostrata Ait. Spurge.
FWS-C. Seen only occasionally on Sand Island, growing along the edge of paved runways.
- Euphorbia pulcherrima Willd. Poinsettia.
FWS-C. Found growing as an ornamental at one residence formerly occupied by Pan-American employees, on Sand Island.

- Ricinus communis L. Castor-oil bean.
FRF; FWS. An occasional small plant was seen on Eastern Island.
On Sand Island there are several fairly large patches, some of them
far distant from the residential area.
- Schinus terebinthifolius Raddi Christmas berry.
FRF; FWS-C. Noted only as a hedge plant on Sand Island.
- Hibiscus tiliaceus L. Hau.
FWS-C. Hau trees are to be found about the residential sector
on Sand Island, and one or more near the old control tower on
Eastern Island. Occasional specimens occur widely scattered about
the Sand Island scrub.
- Hibiscus sp. Hibiscus.
FWS. Quite a few nice specimens of flowering hibiscus shrubs
occur in the residential sector on Sand Island.
- Malvastrum coromandelianum (L.) Garcke
St. J.; FWS-C; FRF. Occasional plants may be found about the
residential area on Sand Island, and two or three are growing near
the old control tower on Eastern.
- Sida fallax Walp. Ilima.
C. & C.
- Thespesia populnea Sol. ex Correa Milo.
FWS. One milo tree was noted growing on the lawn of the
Administration building on Sand Island.
- Waltheria indica L.
St. J.
- Terminalia catappa L. Tropical almond; false kamani.
FWS. Scattered trees may be found almost all over Sand Island,
and a few nice specimens were seen on Eastern Island.
- Carissa grandiflora A. DC. Natal plum.
FWS-C. Found growing only as a hedge plant in the residential
area of Sand Island.
- Catharanthus roseus (L.) G. Don Periwinkle.
FWS-C. Seen only as a flowering ornamental near the old Pan-
American Gooneyville Lodge on Sand Island.
- Thevetia peruviana (Pers.) K. Schum. Bestill tree.
FWS-C. Found only as an ornamental in the residential area of
Sand Island.
- Nerium oleander L. Oleander.
St. J.; FWS-C. Seen only as an ornamental and hedge plant in
the residential area of Sand Island.

- Ipomoea indica (Burm.f.) Merr. Morning glory.
C. & C.; FWS-C. Growing profusely near one residence on Sand Island. Several plants growing near an old building in the revetment area on the south shore of the island.
- Ipomoea pes-caprae (L.) Sweet Beach morning glory.
C. & C. FWS-C. Locally common, this plant is most often found in open sandy areas in the interior of both islands, or along the sandy upper beach-lines.
- Messerschmidia argentea (L.f.) Johnston Tree heliotrope.
FRF; FWS-C. Not uncommon, but widely scattered on both Sand and Eastern Islands. Often seen emerging above the Scaevola scrub.
- Lantana camara L. Lantana.
FWS-C. Found only as a hedge and ornamental plant in the residential and administrative area of Sand Island.
- Stachytarpheta jamaicensis (L.) Vahl. False vervain.
St. J.
- Vitex trifolia var. bicolor (Willd.) Mold.
FRF; FWS-C. Found only as an ornamental planting in the residential area on Sand Island.
- Phyllostegia variabilis Bitter
C. & C.
- Solanum nigrum L. Nightshade.
St. J.; FRF; FWS-C. Occasional, found mostly in utility areas about buildings.
- Solanum laysanense Bitter
C. & C.
- Solanum nelsoni var. intermedium F. Br.
C. & C.
- Plantago lanceolata L. Plantain.
St. J. While this plant was reported 20 years ago, the senior author, thoroughly familiar with it at home, did not find it.
- Scaevola frutescens (Mill.) Krause Naupaka.
C. & C.; FRF; FWS-C. Abundant. The dominant vegetation of both islands. It is gradually creeping to the tops of the old revetments, recapturing areas lost to military destruction. Where undisturbed, in vacant lot, and in waste land.
- Conyza bonariensis (L.) Cronq. Horseweed.
St. J.; FRF; FWS-C. Locally abundant, mostly along the margins of runways and unpaved roadways; also noted in utility areas where the sand has been disturbed, in vacant lots, and in waste land; on both Sand and Eastern Islands.

Gnaphalium purpureum L.

Purple-weed.

FRF. Very rare, found in the shade of a building at the Air Terminal on Sand Island.

Gnaphalium sandwicensis f. canum Sherff

FWS-C. Locally common along margins of runways and in old administrative areas on Eastern Island, and thinly but widely scattered in similar locations on Sand Island.

Pluchea odorata (L.) Cass.

FRF; FWS-C. More widespread on Eastern Island than on Sand Island, but abundant on both. This weed species has taken over many open areas where the soil was disturbed by construction work, such as along the margins of runways, and now forms an almost impenetrable barrier to heights of four to five feet.

Bidens pilosa L.

Spanish needle.

FRF. Dr. Fosberg found it common in weedy ground on Sand Island.

Sonchus oleraceus L.

Sow thistle.

FRF; FWS-C. Rare; only an occasional plant was seen growing along utility toads and in service areas on both Sand and Eastern Islands.

Xanthium saccharatum Wallr.

Cocklebur

St. J. We knew of St. John's report of cockleburs on Midway, but did not find the plant.

Verbesina encelioides Gray

FRF; FWS-C. Abundant on both islands, though more widespread on Eastern than on Sand. Forms a dense cover on many of the open areas in the interior of the islands, taking over areas that would be better vegetated if in grasses. Offers the only bit of color on the islands with its multitude of golden blossoms.

The plants reported herein represent 35 families and 91 species. Of these, 24 species listed in the 1931 and 1935 papers were not seen by either Dr. Fosberg or the authors in 1954. Their present status is therefore unknown. In addition to these, Hadden (1941) and Bryan (1942) listed a variety of plants that had grown on Midway, some of them by common name. We did not find the following group of plants listed by Hadden and Bryan:

Kou	Baobab	Coprosma	Flame tree	Papaya
Tamarix	Brassia	Cypress	Acalypha	Dieffenbachia
Sanseveria	Panax	Plumeria	Ti	Pinus, Oregon forms.
Limes	Dracaena	Buttonbush	Croton	

The Midway Islands of today are a different sight than that seen by the early explorers, or the first Cable Company employees of fifty years ago. There is little expanse of glaring white sand. As the plane approaches the islands, and as the newcomer catches his first glimpse of them, his first reaction is to note the geometric pattern of runways, and the second is to comment that these are green islands, not deserts. As the plane comes

closer the green of the uneven forest of Casuarina and the Scaevola scrub begins to outline the working facilities of the islands, and as the plane sinks down onto the runway it flashes, in early November, past bright golden Verbesina growing along the runway's edge and in the open spaces. We board the bus and drive into the shaded ironwood section that is the residential portion of Sand Island, where, as we listen to the ocean breeze through the ironwoods, we may easily forget that we have travelled to the islands Midway of the north Pacific and think ourselves back home again - until the bus driver slams on the brakes and we wait while a strolling gooney bird parades across the road. Whereupon we either smile or cuss a bit, and say "This is Midway."

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