

Commonwealth of the Northern Mariana Islands Wetland Plants Identification Guide



30 September 2018

Prepared For:

Division of Coastal Resources Management
CNMI Bureau of Environmental and Coastal Quality
Commonwealth of the Northern Mariana Islands

Prepared By:

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Lainie Berry Ph.D.
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INTRODUCTION

Wetlands are fragile ecosystems that provide important ecological services to society: they help recharge groundwater systems, filter water pollutants, reduce runoff, and act as buffers against flooding. They also provide habitat for wildlife, some of which may be rare or endangered, and nursery grounds for the juvenile stages of many marine species, including economically important ones. Wetlands also offer recreational and educational opportunities and are major carbon sinks that can influence the global carbon cycle.

Different types of wetlands are often characterized by the plants that are adapted to the specific wetland environment. Identifying wetland plants is a key part of confirming the presence of wetlands and delineating wetland boundaries. The composition of a wetland's vegetation can indicate a wetland's function and condition and can help inform management decisions and restoration efforts. Understanding and protecting these critical ecosystems can yield numerous ecological, economic, and social benefits.

Regulatory Context

Wetlands in the CNMI fall under state and national jurisdiction. This means they are regulated and managed by numerous agencies with overlapping jurisdiction. Recognizing the importance of wetlands to the community, the Commonwealth of the Northern Mariana Islands (CNMI) Division of Coastal Resources Management (DCRM) classifies wetlands and mangrove areas as an "Area of Particular Concern" (APC). Development proposals within wetlands and mangrove areas must obtain APC permits to ensure that these areas are preserved or enhanced (see NMIAC § 15-10-330). Wetland delineation is required for the APC permit application. The APC permit application further recommends that wetland conditions be assessed using the CNMI Rapid Assessment Method (RAM), which is available at www.dcrm.gov.mp (DCRM 2015).

Wetland Delineation Process

The term "wetlands" is defined in 40 CFR 230.3 as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to

support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” Under this definition a prevalence of vegetation typically adapted for life in saturated soil conditions (hydrophytic vegetation) is an essential criterion defining a wetland.

At the federal level, Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged or fill material into waters of the United States, including wetlands. One major application of the CNMI wetland plants identification guide is providing a tool for positive identification of wetland plants to determine whether a plant community is hydrophytic during the wetland delineation process.

The 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987) together with the regional update (USACE 2012) comprise the current federal delineation method used in the CWA Section 404 regulatory programs for the identification and delineation of wetlands. Under normal circumstances the method to determine an area as a wetland

requires positive evidence of hydrophytic vegetation, hydric soils, and wetland hydrology.

During wetland delineation “prevalence” of vegetation is based on the “50/20 rule” for selecting dominant species from a plant community when quantitative data are available. The rule states that for each stratum in the plant community, dominant species are the most abundant ones (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for the stratum, plus any additional species that individually comprise 20% or more of the total dominance measure for the stratum. The list of dominant species is then combined across strata. Species with an indicator status of OBL (obligate), FACW (facultative wetland), or FAC (facultative) are typically adapted for life in anaerobic soil conditions. When the dominant species in a plant community are typically adapted for life in anaerobic soil conditions, hydrophytic vegetation is present.

To streamline the wetland assessment and regulatory process, DCRM has adopted the federal definition: “except that no ‘federal nexus’ is required” (NMIAC 15-10-

020(zzz)). Therefore, DCRM’s jurisdiction extends to all wetlands that meet the parameters of the current regional U.S. Army Corps of Engineers supplement. As noted in the resources section of this guide, DCRM’s requirements for delineation reports are similar to those of the U.S. Army Corps of Engineers and are outlined in the 2017 publication “Guidance for CNMI Wetland / Waters Delineation Report Contents” available at www.dcrm.gov.mp (DCRM 2017).

CNMI Rapid Assessment Method

The 2015 RAM of CNMI was developed to support DCRM’s permitting process and comprehensive management objectives. Development and implementation of this CNMI RAM aims to facilitate wetland and mangrove evaluation and support ecologically sound permitting, management, and mitigation efforts.

The RAM provides a cost-effective tool to assess and monitor wetland conditions and functions to achieve the DCRM’s management goal of no net loss in wetland area and wetland functions. The CNMI RAM was used to update the wetland maps of Rota and Tinian and to evaluate the wetlands of Saipan. A supplemental “Stream Visual

Assessment Protocol” was developed in 2018 to support similar quantification and management efforts for stream systems.

Vegetation in and around wetlands are important indicators of wetland function and condition. Three out of 15 indicators in the RAM (native wetland plant, invasive wetland plant, and invasive upland plants) rely on correct plant identification. Although photographic references were provided in the RAM, this guide provides more in-depth information and comparison of similar species to support more accurate field identification for the RAM and for wetland delineation reports.

Design Approach and Information Sources

This CNMI Wetland Plant Identification Guide expands on the Native Wetland Plants Guide previously published by the DCRM office (Zarones 2012) but includes a more comprehensive listing of plants associated with wetland systems in CNMI and provides more in-depth plant identification and habitat information. This guide is designed to be used as a field reference for wetland plants that are regularly found in the CNMI, particularly Saipan,

Tinian, and Rota that are subject to the most development pressure.

This guide is aimed for users with various levels of botanical knowledge and identification skills. As the guide is designed to be a quick visual reference for identifying plants in the wetland environment, it will be the most useful for users with beginner to intermediate plant identification skills. Therefore, the plant descriptions and identifying features selected are, in general, less technical than traditional floristic treatments.

For more advanced botanists and wetland practitioners, this guide provides an overview of the region's wetland plants and vegetation. For more comprehensive information on wetland plants, the reference section at the end of this guide provides a collection of useful literature on wetland plants of the CNMI.

In addition to its use in the regulatory and permitting process, this guide will also have applications in conservation, restoration, and mitigation. Understanding the vegetation composition of wetlands can provide vital

information for identifying issues, setting goals and priorities for further habitat assessment, as well as planning restoration and conservation efforts. By identifying the wetland plant communities and understanding the habitat requirement of the wetland plants, the guide can advise resource managers not only on the current habitat condition but also threats to the system and management options to address them.

To decide which wetland plants to include in this guide, the 2016 National Wetland Plants List (Lichvar et al. 2016) was cross-referenced with distribution records (Fosberg et al. 1975; Raulerson 2006; Wagner et al. 2012) to verify the occurrence in CNMI. This initial list was then assessed for the relative frequency in CNMI based on previous wetland surveys, floristic works, input from the interagency working group, and the authors' own field experience. Species that are not regularly encountered in the wetlands of CNMI were excluded. Species commonly found but not listed in the South Pacific Islands subregion of the 2016 National Wetland Plant List were added during this assessment. Although upland species are not included in this guide, such an expansion may be helpful in future revision to this guide.

Taxonomy

Because the floristic treatment of plants in CNMI is outdated and limited, the authors' checked the scientific name and synonyms from several sources and decided on the most valid name currently in use based on this analysis. Therefore, the scientific name and family classification are updated to the best of the authors' knowledge and may differ from previous references. Synonyms are provided as reference to previously used names.

English and Local Names

Common names in English are provided for all species, although these English names may not be widely used locally. Chamorro names are provided as available, particularly for the economically or culturally important species. A significant portion of the plants on the list are either late introductions or are not usually recognized; therefore, no Chamorro names are available.

Wetland Indicator Status

Wetland indicator status follows the 2016 National Wetland Plant List for the species listed under the South Pacific

Islands subregion. For species not listed, the wetland indicator status is based on the authors' field observations and through referencing the indicator status of the same species from other regions. The proposed wetland indicator status is denoted with an asterisk (*) in this guide. For these species, users should check the latest National Wetland Plants List before assigning the wetland rating during wetland delineation, and whenever available, the wetland indicator status should follow that of the National Wetland Plant list.

Plant Descriptions

Plant descriptions in this guide are based on previous floristic works in the Mariana Islands, when available, and are supplemented with the authors' own field observations. The descriptions use relatively simple language and basic botanical terms to avoid confusion for non-botanically trained users.

Provenance and known occurrence in CNMI are mostly based on the *Checklist of Plants of the Mariana Islands* (Raulerson 2006) and the Flora of Micronesia website

(Wagner et al. 2012), the latter largely based on the works of Fosberg, Sachet, and Oliver from 1975 to 1993.

Habitat descriptions are based on the authors' field observations as well as published documentation. The sources that are especially worth mentioning are *The Vegetation of Micronesia: General Descriptions*, *The Vegetation of the Marianas Islands*, and *A Detailed Consideration of the Vegetation of Guam* (Fosberg 1960); *Flora of Guam* (Stone 1970); *Inventory and Mapping of Wetland Vegetation in Guam, Tinian and Saipan, Mariana Islands* (Moore et al. 1977); and *A Guide to Pacific Wetland Plants* (Stemmermann 1981).

Photographs

The guide provides photos of each plant to help illustrate its identifying features, such as growth habit, overall branching pattern and foliage, and reproductive parts. In general, two to three photos are provided for each plant with at least one illustrating reproductive parts.

Although most of the photos used in this guide were taken by the authors, Dr. Arthur Whistler graciously provided

many high-quality photographs and detailed views of plants that were not otherwise available to the authors, which improved the guide significantly.

WETLANDS OF CNMI

For its relatively small area, the CNMI features a wide variety of wetlands. Major wetland types that can be found in the CNMI include estuaries, streams, lakes, ponds, marshes, and swamps, all of which should be recognized and protected. Brief descriptions of each wetland type are provided below along with representative photographs.

Estuaries

Several ephemeral or permanent streams on the east and west sides of Saipan form small estuaries at their mouths. One of the largest estuaries forms at Jeffrey's Beach, where the Talofofo Stream meets the ocean. Plants in these habitats are generally salt-tolerant due to the brackish conditions.

Streams

The most extensive network of freshwater streams in the CNMI occurs in the Talakhaya region on the south side of



Coastal estuary, Jeffery's Beach Saipan

Rota. Here, rainwater that has fallen in the Sabana Plateau above and filtered through the porous limestone layer, meets the impervious volcanic layer below and emerges in springs to form permanent streams. Not only do streams serve as a source of drinking water for island residents, but they are also habitat for the endangered Rota Blue Damselfly (*Ischnura luta*) and other stream dependent species.



Freshwater stream, Talakhaya, Rota



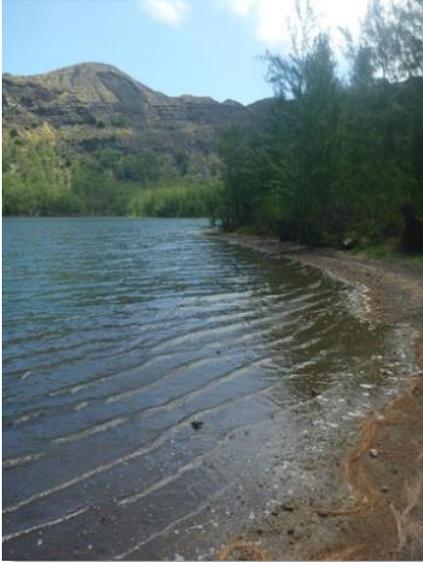
*Endangered Rota blue damselfly
(Ischnura luta)*

Lakes

The largest lake in the CNMI is Lake Susupe on Saipan at approximately 45 acres in size. It reaches a depth of around 10 feet and is fringed by *Schoenoplectus subulatus* and *Acrostichum aureum*. This lake is brackish and surrounded by marshes and swamps. Other lakes include Lake Hagoi on Tinian, a freshwater lake that sits above an impervious surface or a perched water table surrounded by extensive marshes, and two lakes on Pagan: Laguna Sanhiyon (Upper or Inner Lake) at 43 acres and Laguna Sanhalom (Lower or Outer Lake) at 40 acres. Both lakes are slightly brackish, and the Inner Lake is heated by hot spring vents.



Lake Susupe, Saipan



Laguna Sanhiyon Inner Lake, Pagan

Ponds

Ponds are small water bodies that can be natural or man-made, ephemeral or permanent. With the exception of the Susupe Lake potholes complex, the most common ponds in the CNMI are man-made and found on golf courses. These can be limited in wetland vegetation but can provide useful habitat for migratory and resident wetland birds.



Pond, Kingfisher Golf Course, Saipan



Endangered Mariana Common Moorhen
(*Gallinula chloropus guami*)

Marshes

There are extensive freshwater marshes on Saipan surrounding Lake Susupe, and extending north to Oleai and south to Chalan Kanoa and San Antonio. Parts of these marshes were used for rice cultivation and have been heavily modified through land fill and road and drainage construction. Regardless, a significant area remains as wetland habitat. There are also marshes on either side of Middle Road in the Tanapag and San Roque areas on Saipan. The dominant plant within these marshes is *Phragmites karka*. Lake Hagoi on Tinian is also surrounded by extensive marshes.



Chalan Kanoa ponds and marshes, Saipan

Swamps

Swamps can be freshwater or saltwater and are characterized by woody wetland plant species. Saltwater swamps are dominated by mangrove trees (described in the next paragraph). Freshwater swamps in the CNMI are most commonly dominated by *Hibiscus tiliaceus*. Examples include Marpo Swamp on Tinian and the extensive forests to the west of Lake Susupe on Saipan.



Mangrove forest, Sadog Tasi, Saipan

Mangrove vegetation is found where tidal waters create saline wetlands. The only mangroves in the CNMI are found on Saipan. Formerly more extensive on the west side, there are remnant stands at Sadog Tasi, American Memorial Park, Smiling Cove Marina, and at stream mouths between Lower Base and Tanapag.



Juvenile mangrove, Tanapag, Saipan

WETLAND PLANTS IDENTIFICATION

When observing plants, it is best to understand the basic scheme of plant morphology and examine each structure systematically so that identifying features are not overlooked. This is especially important when identifying similar species. The following section describes common plant features used in this guide.

Habit

Habit describes the overall appearance and growth pattern of a plant. It starts with the life forms of plants (e.g. tree, shrub, vine, herb, fern, etc.), the general size and height of the plant, then points out features on the roots, rhizomes, or stems that form the basic structure.

It should be noted that the definition of life forms used in the 1987 *Corps of Engineers Wetlands Delineation Manual* is different from that used in the traditional botanical terminology in this guide. The 1987 manual uses these terms to differentiate types and layers in a plant community and simply defines trees (woody overstory) as any woody plant >3.0 inches in diameter at breast height, regardless of

plant height, exclusive of woody vines. Saplings/shrubs (woody understory) are defined as any woody plant over 3.2 feet in height but with a stem diameter less than 3 inches, exclusive of woody vines. Herbs (herbaceous understory) are defined as all non-woody plants and woody plants less than 3.2 feet in height. Woody vines are over 3.2 feet in height.

Leaf

Leaves are morphologically diverse and provide valuable features that can be used for identification, especially among closely related species. Characteristics used for identification include leaf arrangement (alternate, opposite, whorled, etc.); the presence or absence of stipules; length of petioles; leaf complexity (simple or compound); type of compound leaf (e.g., trifoliate, pinnate, bipinnate, palmately compound, etc.); leaf shape (as a whole, as well as the base, margin, and apex); size; texture and hairiness of the surfaces; and the form, length, stiffness, and density of any hairs (see page 94 and 95). In grasses and sedges, the leaf generally consists of a sheath that encloses the stem, the leaf

blade, and ligule (a structure at the junction between sheath and blade).

Flower

A flower is the most complex part in a plant and provides features critical for correct identification. To identify a plant without reproductive parts (flower or fruit) can be challenging and sometimes impossible. Therefore, it is advisable to locate and use plant materials in the reproductive stage for identification. The arrangement of flowers (inflorescence, e.g., solitary, spike, raceme, cyme, umbel, panicle) and position of the inflorescence (e.g., axillary, terminal, etc.) are often reliable characteristics. Flowers are supported by the axis, which has different forms and terminology for the different position and plant groups (e.g., scape, peduncle, pedicel for dicots and ray, rachis, and rachilla for sedges). Flowers are often preceded by bracts, which essentially are modified leaves to protect the more fragile flower parts. Occasionally the bracts can be showy to attract pollinators.

A flower can be viewed as a terminal shoot that has layers of modified leaves serving different functions. The layers

from the outside to the center are perianth (sepal, petal, tepal, and corolla), stamen (the male part, which consists of filament and anther), and pistil (the female part, which consists of ovary, style, and stigma). The diversity in arrangement, shape, size, color, and texture usually make the flower the most striking feature of a plant. For some plant groups that do not rely on animal pollinators, the perianth can become much reduced and inconspicuous, with only the male or female part left.

Fruit

Fruit is often a more reliable identifier source than flowers, which are typically short-lived. The type and structure (e.g., achene, berry, capsule, drupe, legume) of a fruit can be very consistent characteristics across the genus or family, yet often provide enough variation to differentiate between species. Seeds also provide useful features for identification when available since the shape, size, color, and texture can be key identifying characteristics. For example, the basic shape of achenes (2- vs. 3-sided) is an important feature for identifying sedges.

Organization of This Guide

Plant descriptions and photographs of the 73 plants that regularly occur in CNMI's wetlands are provided below. Wetland plants are first categorized by life form, followed by scientific names so the user can quickly narrow down the plant in hand to a smaller set of candidates with similar life form. Starting from woody species (trees, shrubs, and woody vines), followed by herbs, which are then divided into ferns, dicotyledons, and monocotyledons. The grasses and sedges are separated out from other monocotyledonous herbs, as these have distinctive growth form and are easier to identify when closely related species are compared together. The life forms and wetland indicator status of each plant are color-coded for easy reference (see page 16).

Despite our best efforts to limit the use of overly technical terms, the use of basic botanical terminology for the sake of precision and conciseness is unavoidable. A basic understanding of botanical terms therefore enhances effective use of this guide. Since these terms may be unfamiliar to non-botanist users, a glossary is provided (see page 90).

COLOR CODE CHART

Life Form

Tree



Shrub



Woody Vine



Herb



Herb-Vine



Herb-Fern



Herb-Dicot



Herb-Monocot



Herb-Grass



Herb-Sedge



Wetland Indicator Status

Obligate (OBL)



Facultative Wetland (FACW)



Facultative (FAC)



Facultative Upland (FACU)



Upland



POND APPLE

Local Name: None Recorded

Life Form: Tree

Annona glabra L.

Family: Annonaceae

Wetland Indicator Status: OBL

Habit: Tree up to 12 m tall, forming a buttress with age.

Leaves: Alternate; leaf blades ovate to oblong, 6–20 × 3–8 cm; margins entire; petiole 0.8–2.5 cm.

Flowers: Solitary, 2–3 cm across; petals in two rows of 3; outer 3 cream-colored, with a red spot at base; inner 3 whitish outside, dark red inside.

Fruits: Fleshy, oblong to spherical, 5–12 × 5–8 cm, smooth, yellow to orange; seeds many, pale reddish brown, 1.3–1.5 cm long.

Distribution: Introduced; occurs on Saipan. Native to tropical America.

Habitat: Riverbanks and wetlands. It tolerates brackish water.

Note: Widely cultivated for its edible fruit. It has escaped cultivation and become invasive in many Pacific islands.



COMMON BAMBOO

Local Name: Piao palaoan

Life Form: Tree / Woody Grass

Bambusa vulgaris Schrad. ex J.C. Wendl.

Family: Poaceae

Wetland Indicator Status: FAC*

Habit: Large clumping bamboo with a short, thick rhizome; culms 8–15 m tall, 5–9 cm in diameter, bending away from the center of the clump; branches many.

Leaves: Leaf blade narrowly lanceolate, 10–30 × 1.3–2.5 cm, glabrous, entire at the margins.

Flowers: Rarely forming.

Distribution: Introduced; occurs on Anatahan, Pagan, Rota, Saipan, Tinian, and Guam. Native to Indochina and widely cultivated.

Habitat: River banks, roadsides, wastelands, and open ground.

Note: The variegated form has yellow stems with green stripes.



FISH POISON TREE

Local Name: Putting, Puteng

Life Form: Tree

Barringtonia asiatica (L.) Kurz

Family: Lecythidaceae

Wetland Indicator Status: FACU

Habit: Tree up to 15 m tall; bark gray.

Leaves: Alternate, large, up to 50 cm long, rounded at the tip, tapered to short-petiolate at the base; surfaces glabrous and glossy; margins entire.

Flowers: Borne in an erect inflorescence; calyx 2-lobed; petals white; stamens many, long, white at the base, pink at the tip.

Fruits: Fibrous-woody, 4-angled, crowned by the calyx-lob.

Distribution: Native; known to occur on Agrihan, Alamagan, Anatahan, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native to the tropics of Indian Ocean and western Pacific.

Habitat: Sandy or rocky areas close to the sea.

Note: The fruits are common in sea drift, explaining the tree's littoral distribution. The grated seed has a stupefying effect on fish, hence the common name.



FRESHWATER MANGROVE

Local Name: Langasat

Life Form: Tree

Barringtonia racemosa (L.) Spreng.

Family: Lecythidaceae

Wetland Indicator Status: FACW*

Habit: Tree up to 10 m tall.

Leaves: Alternate; up to 40 cm long and 15 cm wide, with toothed margins and a pointed tip.

Flowers: Numerous on the long-hanging inflorescence; calyx 2- or 3-lobed; petals white or pink; stamens many, pink.

Fruits: Ovoid-ellipsoid, 5–8 cm x 3–5 cm, reddish to brown.

Distribution: Native; occurs on Rota and Guam. Native from East Africa through Indo-Malaya to Australia and Micronesia.

Habitat: Rivers, freshwater swamps, or lowlands by ditches; occasionally on rocky shores.

Note: The large white-to-pink flowers are very attractive.



ORIENTAL MANGROVE

Local Name: Mangle machu, Mangle lahe

Life Form: Tree

Bruguiera gymnorhiza (L.) Lam.

Family: Rhizophoraceae

Wetland Indicator Status: OBL*

Habit: Small to medium size tree up to 15 m tall, with low prop roots and knee-like pneumatophores (breathing roots).

Leaves: Petiole up to 4 cm long; leaf blade acute-acuminate at both ends, glabrous, with linear-lanceolate stipules.

Flowers: Solitary in the axils; calyx red, divided into 10–14 lobes ca. 2 cm long; petals 10–14, orange-brown.

Fruits: The viviparous seedlings grow up to 25 cm long on the mother plant before falling off and planting themselves.

Distribution: Native; occurs on Saipan and Guam. Native from East Africa to Southeast Asia and Oceania.

Habitat: Brackish water swamps.

Note: There are good remnant stands at American Memorial Park, Sadog Tasi, and the coastline in between.



IRONWOOD

Local Name: Gagu, Gago

Life Form: Tree

Casuarina equisetifolia L.

Family: Casuarinaceae

Wetland Indicator Status: FAC

Habit: Tree up to 20 m tall; leaf-like branchlets green, with apparent joints.

Leaves: Reduced to scales in whorls at each node.

Flowers: Unisexual, the males borne on terminal spikes; the females head-like, each flower with 2 long stigmas.

Fruits: Cone-like woody structure holding an individual winged nut in each cell.

Distribution: Native; occurs throughout the Mariana Islands. Native to Southeast Asia and Oceania.

Habitat: Very adaptable, as it can grow in limestone, sand, or volcanic soils from relatively dry areas to water edges.

Note: A dominant tree along the shore of Lake Susupe. Chemicals released by the litter are known to inhibit germination and growth of other plants (allelopathy).



BEACH HIBISCUS

Local Name: Pago

Life Form: Tree

Hibiscus tiliaceus L.

Family: Malvaceae

Wetland Indicator Status: FACW

Habit: Small- to medium-sized tree up to 10 m tall.

Leaves: Alternate; petioles 3–12 cm long; blades heart-shaped, up to 20 x 20 cm, with soft downy hairs on the lower surface.

Flowers: Borne in a branched inflorescence or occasionally solitary; petals 5, yellow with a maroon base. The flowers open in the morning then close and turn pink by evening before falling, lasting for only a day.

Fruits: Capsule ca. 2.5 x 2 cm; seeds brownish-black, stiff-hairy.

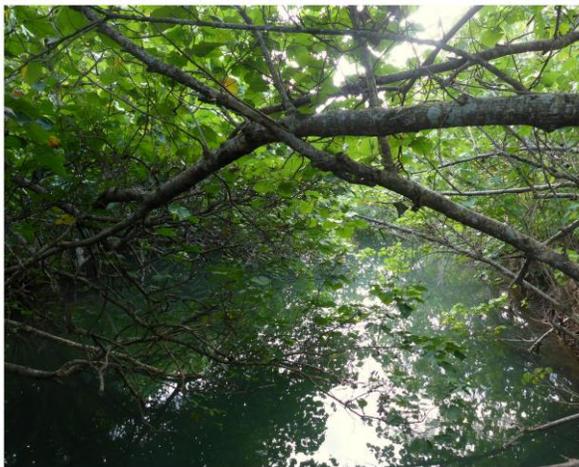
Distribution: Native; occurs throughout the Mariana Islands.

Native to eastern and northern Australia, Oceania, Maldives, South Asia, and Southeast Asia.

Habitat: Wetland edges, mangrove edges, coastal areas, and stream banks.

Synonym: *Talipariti tiliaceum* (L.) Fryxell.

Note: Forms dense impenetrable thickets on wetland edges.



SCREWPINE

Local Name: Pahong

Life Form: Tree

Pandanus dubius Spreng.

Family: Pandanaceae

Wetland Indicator Status: FACU

Habit: Tree with thick, forking stems and aerial roots.

Leaves: Arranged in spirals, usually over 10 cm wide, thick, the tip bluntly rounded with a short, pointed projection.

Flowers: Unisexual, male inflorescence with a creamy yellow spathe; female inflorescence a pendent solitary head.

Fruits: Large heads with waxy, densely packed, slightly purplish, mostly 1-seeded fruitlets.

Distribution: Native; occurs on Rota, Saipan, and Guam. Native to Southeast Asia into the Western Pacific region.

Habitat: Mostly limestone forest and strand community, occasionally in ravine forests.

Synonym: *Hombronina edulis* Gaudich.; *Pandanus hombronina* F. Muell.; *Pandanus kafu* Mart. var. *confluentus* Kaneh.

Note: *P. dubius* differs from *P. tectorius* by its thicker and wider leaves; bluntly rounded leaf tips; and 1-seeded fruit.



SCREWPINE

Local Name: Kafu

Life Form: Tree

Pandanus tectorius Parkinson ex Du Roi

Family: Pandanaceae

Wetland Indicator Status: FAC

Habit: Small tree with prop roots and forking stems.

Leaves: Arranged in spirals, elongated, usually 1–3 m long, up to 10 cm wide; tips gradually narrowed; margins and midrib with short curved spines.

Flowers: Unisexual, male inflorescences with white spathes, fragrant; female inflorescence a pendent solitary head, with a white bract that sheds early.

Fruits: Composed of numerous woody fruitlets that are orange pulpy at the base when ripe; seeds several per fruitlet.

Distribution: Native; occurs throughout the Mariana Islands. Native to Southeast Asia, eastern Australia, and the Pacific islands.

Habitat: Native and secondary mixed forests, and savannas.

Synonym: *Pandanus fragrans* Gaudich.

Note: *P. tectorius* can be distinguished from *P. dubius* by its thinner and narrower leaves seldom over 10 cm broad, leaf tips tapered into a whip like extension, and multiple seeds per fruit. The fruits are an important food source for the Mariana Fruit Bat.



MANILLA TAMARIND

Local Name: Kamachile

Life Form: Tree

Pithecellobium dulce (Roxb.) Benth.

Family: Fabaceae

Wetland Indicator Status: FACU*

Habit: Tree to 15 m tall, armed with thorns.

Leaves: Alternate, compound with two pairs of leaflets; leaflets asymmetrically elliptic to obovate-elliptic, 0.7–5 cm long, entire, mostly glabrous, rounded or notched at the tip.

Flowers: Borne in racemes or panicles of small heads 0.8–1 cm wide, creamy or yellow.

Fruits: Irregularly swollen, twisted pods up to 12 cm long; seeds black, covered by a white edible pulp.

Distribution: Introduced; occurs on Agrihan, Alamagan, Asuncion Island, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native to tropical regions of Central and South America; cultivated throughout the tropics.

Habitat: Developed and disturbed areas. The tree is drought- and salt-tolerant and adaptable to poor soils.

Synonym: *Mimosa dulcis* Roxb.

Note: Common near habitations.



ASIAN NAKEDWOOD

Local Name: Gasoso

Life Form: Shrub

Colubrina asiatica (L.) Brongn.

Family: Rhamnaceae

Wetland Indicator Status: FACU

Habit: Rambling or climbing shrub.

Leaves: Alternate, often in two rows; blades glossy, ovate, 4–8 x 2–4 cm, serrate at the margins, acuminate at the tip.

Flowers: In small, short-stalked axillary cymes; petals 5, greenish, small, borne on a yellow disc.

Fruits: A globose, 2–3 celled capsule 7–9 mm in diameter, longitudinally dehiscent; seeds grayish brown.

Distribution: Native; occurs on Agrihan, Alamagan, Anatahan, Asuncion Island, Guguan, Maug Islands, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Pantropical.

Habitat: Common in thickets, often near the sea.

Note: Reported from many coasts of the New and Old-World tropics. The seeds are readily dispersed in ocean currents.



WILD TANTAN

Local Name: None Recorded

Life Form: Shrub

Desmanthus virgatus (L.) Willd.

Family: Fabaceae

Wetland Indicator Status: FACU

Habit: Slender shrub 1–3 m tall, without thorns.

Leaves: Alternate, 2-pinnate, with 2–7 pairs of pinnae, each with 10–25 pairs of small leaflets, with a reddish cup-shaped, extra-floral nectary at the upper end of the petiole.

Flowers: In semi-globose heads, white, with long filaments.

Fruits: An elongate and compressed pod, brown, 5–9 cm long, with up to 30 seeds.

Distribution: Introduced; occurs on Agrihan, Saipan, Tinian, and Guam. Native to the southern United States, parts of Mexico, Central America, South America, and the Caribbean.

Habitat: Roadsides, fallow fields, and forest edges.

Synonyms: *Acuan depressum* (Willd.) Kuntze, *Acuan virgatum* (L.) Medik., *Desmanthus depressus* Willd.

Note: The leaves resemble those of *Mimosa diplotricha*, but *D. virgatus* has white flowers and is not prickly.



PEMPHIS

Local Names: Nigas, Nigasi, Nigus

Life Form: Shrub

Pemphis acidula Forst.

Family: Lythraceae

Wetland Indicator Status: FAC

Habit: Shrub or small tree, often with a wind-swept habit.

Leaves: Opposite, sessile, entire, fleshy; blade oblong-elliptic, up to 2.5 x 1.5 cm, but mostly 5–12 mm long.

Flowers: Solitary in the axils, white, about 1.5 cm wide; calyx-tube ribbed, 6-toothed; petals 6, thin, white, wrinkled.

Fruits: Capsules ca. 6–7 mm long, partly clasped by the calyx-tube, opening by a lid; seeds brown, many.

Distribution: Native; occurs on Aguijan, Pagan, Rota, Saipan, Tinian, and Guam. Native to coastal locations in the tropical areas of the Indo-Pacific.

Habitat: Frequent on rocks and shores fronting the ocean, occasionally on the inland edge of mangrove swamps.

Note: Easily identified by its fleshy, opposite leaves, 6-petaled white flowers, and tubular capsule with a dome-shaped lid.



INDIAN FLEABANE

Local Name: None Recorded

Life Form: Shrub

Pluchea indica (L.) Less.

Family: Asteraceae

Wetland Indicator Status: FAC

Habit: Shrub, somewhat aromatic.

Leaves: Alternate, obovate or nearly elliptic, 3–4 x 1.5–2 cm, thick-papery, with toothed margins and a tapered base.

Flowers: Inflorescence of short terminal and subterminal panicles; flower heads ca. 5 x 2 mm; corolla rose-purple.

Fruits: Achenes reddish-brown, with 18–20 tufted bristles.

Distribution: Introduced; occurs on Saipan, Tinian, and Guam. Native of India, south China, throughout Malaysia, south to Australia.

Habitat: Seashore, tidal streams, and swamps.

Note: *Pluchea carolinensis* has larger and hairier leaves.



CANDLE BUSH

Local Names: Acapulco, Akapuku,
Andadose, Candalaria, Take biha

Life Form: Shrub

Senna alata (L.) Roxb.

Family: Fabaceae

Wetland Indicator Status: FAC

Habit: Shrub to 3–4 m tall.

Leaves: Alternate, large, pinnately compound, 50–80 cm long, with 8–14 pairs leaflets; leaflets up to 17 cm long, entire at the margins, truncate to slightly notched at the tip.

Flower: Inflorescence an erect, oblong spike, bearing the crowded and overlapping, yellow flowers.

Fruits: Pods sharply 4-winged; seeds compressed.

Distribution: Introduced; occurs on Agrihan, Saipan, Tinian, and Guam. Native of Mexico.

Habitat: Common along roadsides, in old abandoned fields, and other weedy areas.

Synonym: *Cassia alata* L.

Note: The leaves are a well-known remedy for ringworm.



SESBANIA

Local Name: None Recorded

Life Form: Shrub

Sesbania cannabina (Retz.) Pers.

Family: Fabaceae

Wetland Indicator Status: FAC

Habit: Slender subshrub about 1 m tall.

Leaves: Alternate, pinnately compound, to 30 cm long; leaflets grayish green, in 20–40 pairs, oblong, ca. 10 x 3.5 mm.

Flowers: yellow, ca. 1 cm long, borne in a hanging, 2–6-flowered axillary raceme.

Fruits: Pods slender, curved, many seeded.

Distribution: Introduced; occurs on Saipan and Guam. Native to India and tropical Asia, and widely naturalized.

Habitat: A rather widespread weed in open disturbed areas and wetland margins.

Synonym: *Aeschynomene cannabina* Retz.

Note: An invasive weed in Africa, Asia, Australia, Indian Ocean islands, and the Pacific islands.



SEASIDE CLERODENDRUM

Local Names: Lodugao, Lodigao

Life Form: Shrub

Volkameria inermis L.

Family: Lamiaceae

Wetland Indicator Status: FAC

Habit: Sprawling shrub or woody climber.

Leaves: Opposite or sometimes in whorls of three, elliptic to obovate, 3–12 x 1–7 cm, entire, glabrous, thin-fleshy, with a few sunken glands at the base.

Flowers: Borne in axillary cymes; corolla white to pinkish, 2–3 cm long, 5-lobed, with a slender base; filaments and style red, long-extending beyond the corolla.

Fruits: Black when ripe, obovoid, 1–1.4 cm long, 4-seeded.

Distribution: Native; occurs on Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native from Asia into Oceania.

Habitat: Common along the margins of mangroves and in grassy marshes, occasionally in lowland vegetation.

Synonym: *Clerodendrum inerme* L., a commonly used name.

Note: Leaves and roots are used in folk medicine.



SNUFFBOX BEAN

Local Names: Aayi, Goye, Bagogo, Bayogon dangkula, Lodusong

Life Form: Woody Vine

***Entada pursaetha* DC.**

Family: Fabaceae

Wetland Indicator Status: FACU*

Habit: Large woody vine, with a twisted stem.

Leaves: Alternate, bipinnate; with a terminal, forked tendril; pinnae in 2–3 pairs; leaflets oblong to obovate-oblong, 3.8–7.5 cm long, leathery (coriaceous).

Flowers: Small, white, in simple or branched spikes.

Fruits: Pods large, compressed, up to 100 x 9 cm, somewhat constricted between the seeds; seeds glossy, dark mahogany-brown, 5–6 cm across.

Distribution: Native; occurs on Saipan and Guam. Tropical and subtropical Africa, Asia, and Oceania.

Habitat: Lowland forest, savanna, and stream banks.

Synonym: *Entada pursaetha* DC. is considered a synonym of *Entada rheedii* Spreng. in some taxonomic treatments.

Note: *E. pursaetha* can be distinguished by its bipinnate leaves, 3–5 pairs of leaflets per pinna, and giant seed pod. *E. phaseoloides* has 1 or 2 pairs of leaflets per pinna and occurs on Rota, Tinian, and Saipan.



FLAGELLARIA

Local Names: Bayogon halom tano,
Bejuco halum-tano

Life Form: Woody Vine

Flagellaria indica L.

Family: Flagellariaceae

Wetland Indicator Status: FAC

Habit: Woody vine that climbs with tendril-ended leaves.

Leaves: Sheaths closed, blades glossy green, bamboo-like, 10–40 cm x 2–3 cm, somewhat evenly spaced in two opposite rows, tips elongate to become tendrils.

Flowers: Small, white, many, borne in much-branched terminal spikes.

Fruits: Round, ca. 5 mm across, red when ripe, 1-seeded.

Distribution: Introduced; occurs on Agrihan, Aguijan, Pagan, Rota, Saipan, Sarigan, and Guam. Native to the Old-World tropics into Oceania.

Habitat: Wet gullies in the savannahs and in limestone forests.

Note: This species is easily identified by its bamboo-like leaves with tips curling into tendrils.



SEABEAN

Local Names: Gayetan, Bayogo dikike,
Dikiki gaogao, Bayogon-dailaili

Life Form: Woody Vine

Mucuna gigantea (Willd.) DC

Family: Fabaceae

Wetland Indicator Status: FAC

Habit: Woody vine with the stem robust at the base.

Leaves: Alternate, compound, trifoliolate with 3 leaflets on long petioles; leaflets ovate, with entire margins and an acuminate tip, sub-cordate at the base, up to 15 x 10 cm.

Flowers: Pale green, borne in axillary clusters up to 4 cm long, on long pedicels; calyx with golden hairs.

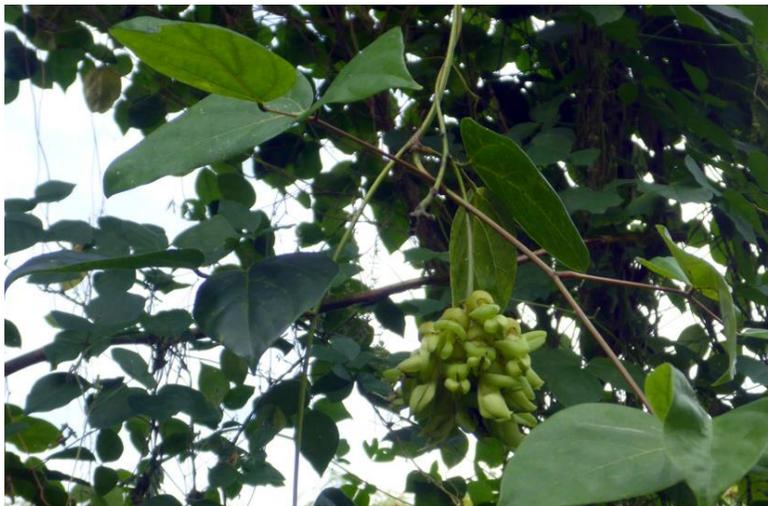
Fruits: Pods oblong, winged, 15–20 x 3–5 cm; seeds compressed, rounded, 2–3 cm in diameter, 8–10 mm thick.

Distribution: Native; occurs on Agrihan, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native from South and East Asia into Oceania.

Habitat: Common in estuaries and forests close to the shore.

Synonym: *Dolichos giganteus* Willd.; *Stizolobium giganteum* (Willd.) Spreng.

Note: The floating seeds are dispersed by ocean currents and are commonly found in beach debris. *Canavalia* species are similar vegetatively but have pinkish flowers and smaller seeds.



GOLDEN LEATHER FERN

Local Name: Langayao

Life Form: Herb - Fern

Acrostichum aureum L.

Family: Pteridaceae

Wetland Indicator Status: OBL

Habit: A robust fern up to 2–3 m tall; rhizomes stout, creeping or erect.

Fronds: Pinnately compound, somewhat leathery, with 20–30 pairs of coarsely toothed pinnae.

Sori: Dark red, felt-like, covering the lower leaf surface.

Distribution: Native; occurs on Anatahan, Pagan, Rota, Saipan, Tinian, and Guam. Pantropical.

Habitat: Coastal or freshwater swamps, lake edges, mangrove edges, stream banks, river mouths, and wet depressions.

Note: Fringing Lake Susupe and in American Memorial Park.



SWAMP SHIELD-FERN

Local Name: None Recorded

Life Form: Herb - Fern

Cyclosorus interruptus (Willd.) Ito

Family: Thelypteridaceae

Wetland Indicator Status: FACW

Habit: Sprawling fern with erect fronds up to 1 m tall; rhizomes long-creeping, black.

Fronds: Pinnately compound, somewhat leathery, with 20–30 pairs of coarsely toothed pinnae.

Sori: Round and arranged in two convergent rows along the edges of the pinnae teeth.

Distribution: Native; occurs on Saipan and Guam. Native to tropical and subtropical regions of the world.

Habitat: Freshwater swamps and marshes.

Synonym: *Thelypteris interrupta* (Willd.) K. Iwats.

Note: Often found in standing water on the margins of Susupe, Garapan, and Tanapag wetland areas.



SESSILE JOY WEED	Local Name: None Recorded	Life Form: Herb - Dicot
<i>Alternanthera sessilis</i> (L.) R.Br. ex DC.	Family: Amaranthaceae	Wetland Indicator Status: FACW

Habit: A creeping herb with numerous branches, stems up to 1 m long; roots forming at leaf nodes.

Leaves: Opposite, sessile, obovate to lanceolate, 1–5 x 0.3–1.5 cm, entire at margins.

Flowers: In sessile clusters in leaf axils, 0.7–1.5 mm across.

Fruits: Each fruit contains a single tiny seed.

Distribution: Native; occurs on Saipan, Tinian, and Guam. Pantropical, origin uncertain.

Habitat: Wetland edges, damp areas, roadside ditches, cultivated areas, and disturbed ground.

Note: Occasionally seen in cultivation.



VALLEY REDSTEM

Local Name: None Recorded

Life Form: Herb - Dicot

Ammannia coccinea Rottb.

Family: Lythraceae

Wetland Indicator Status: OBL

Habit: Annual herb, ca. 60–90 cm tall; stems square in cross section.

Leaves: Opposite, sessile, linear-lanceolate, 5–8 × 0.3–0.7 cm, entire at margin, usually auriculate at base.

Flowers: 3–5 in axillary cymes; subsessile, sepals forming a floral tube; petals 4 (5), rose-purple, obovate.

Fruits: Capsules subglobose, 3.5–5 mm in diameter, surrounded by the floral tube; seeds many.

Distribution: Introduced; occurs on Saipan and Guam. Native to North and South America; naturalized in East Asia and Pacific.

Habitat: Muddy shores of ponds, mud flats along rivers, shallow ditches, and damp grassy areas.

Synonyms: *Ammannia octandra* L. f.

Note: Leaf pairs set at right angles to the ones above and below.



WATER HYSSOP

Local Name: None Recorded

Life Form: Herb - Dicot

Bacopa monnieri (L.) Pennell

Family: Plantaginaceae

Wetland Indicator Status: OBL

Habit: Creeping perennial herb, sometimes forming floating mats.

Leaves: Opposite, sessile, small, spatulate to obovate, 1–1.5 x 0.3–0.5 cm, somewhat succulent.

Flowers: Axillary, solitary, white or lilac, yellow at base, bell-shaped, 4–5-lobed.

Fruits: Capsules 2-valved, enclosed by the calyx, bent downward; seeds few, black, less than 1 mm long.

Distribution: Native; occurs on Saipan and Guam. Pantropical.

Habitat: Damp ground, streams, ditches, and brackish marshes.

Synonyms: *Bramia monnieri* (L.) Drake and *Lysimachia monnieri* L.

Note: Observed at north shore of Lake Susupe.



DODDER LAUREL

Local Name: Agasi, Agase, Agace, Mayagas

Life Form: Herb - Vine

Cassytha filiformis L.

Family: Lauraceae

Wetland Indicator Status: FACU

Habit: Twining vine, parasitic on various trees and shrubs; stems slender, branched, orange to green.

Leaves: Reduced to minute scales.

Flowers: White, small, less than 2 mm, in short spikes about 2.5 cm long; perianth lobes 6, in 2 series.

Fruits: Subglobose, 6–7 mm long, with 1 seed.

Distribution: Native; occurs on Alamagan, Asuncion Island, Guguan, Pagan, Rota, Saipan, Tinian, and Guam. Pantropical.

Habitat: Strand vegetation, coastal woodland, savanna, grassland, and forest margins.

Note: String-like parasitic vine climbing and forming yellowish tangles over other plants, on open cinders on Guguan, found as high as 350 m on Asuncion.



FALSE DAISY

Local Name: Titma, Titimo

Life Form: Herb - Dicot

Eclipta prostrata (L.) L.

Family: Asteraceae

Wetland Indicator Status: FACW*

Habit: Annual with numerous branches, up to 50 cm tall.

Leaves: Opposite, sessile, 3–8 x 1–2.5 cm, covered in fine white hairs, rough in texture.

Flowers: Flower heads daisy-like, to 1 cm across, borne on a long stalk up to 7 cm long.

Fruits: Achenes black, glabrous except for a few apical hairs, ca. 2.8 mm long, 3- or 4-angled.

Distribution: Introduced; occurs on Agrihan, Alamagan, Maug Islands, Rota, Saipan, and Guam. Native to America and widely naturalized throughout the world.

Habitat: Wetland edges, roadside, and ditches.

Synonym: *Eclipta alba* Hassk., *Eclipta erecta* L., *Verbesina alba* L., *Verbesina prostrata* L.

Note: A very common weed of open and wet areas.



SOFT ELEPHANT'S FOOT

Local Name: Papago Baka, Papago Halen Tano, Papago Halom Tano, Papago Halumtanu, Papago Vaca, Papago Vaka, Halomtano

Life Form: Herb - Dicot

Elephantopus mollis HBK.

Family: Asteraceae

Wetland Indicator Status: FAC

Habit: Herbaceous perennial up to about 1 m tall.

Leaves: Alternate, up to 15 x 6 cm, hairy, obovate, tapered to the base, margins toothed, petiole short, winged.

Flowers: Small, white, to 4 mm long, clustered in heads.

Fruits: Achenes black, ca. 3 mm long; pappus ca. 4 mm long.

Distribution: Introduced; occurs on Agrihan, Alamagan, Anatahan, Asuncion Island, Rota, Saipan, Tinian, and Guam. Native to America.

Habitat: A weedy species occupying previously disturbed lands.

Note: A very widespread invasive plant throughout the tropics; the seeds can be dispersed by wind or by attaching to clothing or animal fur.



INDIAN HELIOTROPE

Local Name: Bathena, Betbena

Life Form: Herb - Dicot

Heliotropium indicum L.

Family: Boraginaceae

Wetland Indicator Status: FAC

Habit: Erect annual herb, 15–50 cm tall.

Leaves: Alternate, ovate, 2.5–10 x 1–5 cm, rough in texture, crinkly at margins.

Flowers: Small, blue-white with an orange center, borne along one side of coiled spikes.

Fruits: Capsule 2-valved, sessile, ovoid, 3–3.5 mm long, 2 nutlets per cell.

Distribution: Native; occurs on Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native to Asia; naturalized in tropical and subtropical regions throughout the world.

Habitat: Damp places, roadside ditches, and borders of drains.

Synonym: *Tiaridium indicum* (L.) Lehm.

Note: This species can be distinguished by its curved, 1-sided spikes, with many tiny light blue to purple flowers.



FALSE IRONWORT

Local Name: Batunes, Botones

Life Form: Herb - Dicot

Hyptis capitata Jacq.

Family: Lamiaceae

Wetland Indicator Status: FAC

Habit: Erect subshrub 0.5–2 m tall; stems 4-sided.

Leaves: Opposite, broad ovate–oblong, 5–15 x 2–6 cm, serrate at the margins; petiole 2–3 cm long.

Flowers: Small, clustered in solitary globular heads; white with faint purplish spots on the upper lip of the corolla.

Fruits: Capsule enclosed in calyx tube, with up to 4 nutlets.

Distribution: Introduced; occurs on Rota and Guam. Native to tropical America; widely naturalized in tropical and subtropical regions.

Habitat: Settled areas, open waste places, and fallow rice paddies.

Note: This species can be distinguished by its square stems and dense globose head-like inflorescence.



SWAMP MORNING-GLORY

Local Name: Kankun, Kangkung

Life Form: Herb - Dicot

Ipomoea aquatica Forssk.

Family: Convolvulaceae

Wetland Indicator Status: OBL*

Habit: Creeping or floating perennial vine, with stems up to 3 m long, often rooting at the nodes.

Leaves: Alternate; petioles long, 3–10 cm; blades variable, 5–15 x 2–6 cm, often shaped like an arrowhead (hastate).

Flowers: Inflorescence axillary; corolla funnel-shaped, ca. 5 cm wide, 4–10 cm long, purple at center, margins paler.

Fruits: An ovoid to globose capsule, to 1 cm in diameter; seeds covered with short hairs (pubescent).

Distribution: Introduced; occurs on Pagan, Rota, Saipan, Tinian, and Guam. Native to tropical Africa, Asian, and Australia; widely cultivated and naturalized in tropical and subtropical regions.

Habitat: Muddy stream banks, freshwater pond, lakes, and marshes.

Note: Edible, commonly grown and harvested as greens.



BEACH MORNING-GLORY

Local Name: Fofegau Halaе, Alalag-Tasi, Alaiyai, Alaihai-Tasi, Alalag, Alalag-Tassi, Alalai Sabana, Alalai-Tasi, Alalak, Halihai

Life Form: Herb - Vine

***Ipomoea pes-caprae* (L.) R. Br.**

Family: Convolvulaceae

Wetland Indicator Status: FACU

Habit: Prostrate perennial vine; stems < 1 cm in diameter.

Leaves: Alternate; leaf blades obtuse to broadly elliptic, 6.5–11.5 x 5–9 cm, glabrous, coriaceous, somewhat fleshy, entire at margins, mostly notched at the tip.

Flowers: One to several on a pedicel up to 15 cm long; sepals 5; corolla funnel-shaped, rosy-pink, ca. 5 cm across.

Fruits: A round, glabrous capsule about 1.3 cm long, with up to 4 seeds each; seeds black, with dense brown hairs.

Distribution: Native; occurs throughout the Mariana Islands. Indigenous throughout the Pacific.

Habitat: Sandy or rocky beaches, also near the edge of tidal wetlands.

Note: Very common, forming low groundcover on beaches.



LINERLEAF PRIMROSE-WILLOW

Local Name: Titimo,
Charguan Asusuyan

Life Form: Herb - Dicot

Ludwigia hyssopifolia (G. Don) Exell

Family: Onagraceae

Wetland Indicator Status: FACW

Habit: Erect annual up to 1 m (rarely 2–3) tall.

Leaves: Alternate, lanceolate, 1.5–9 x 0.5–3 cm, with 11–17 pairs of lateral nerves; petiole 3–18 mm.

Flowers: Solitary from leaf axil, subsessile; petals 4, yellow, acute to rounded at the tip, not notched.

Fruits: A cylindrical, finely pubescent capsule, 1.5–3 cm x ca. 1 mm, fused in the upper 1/6–1/3; seeds many, <1 mm long.

Distribution: Native; occurs on Rota and Guam; pantropical in distribution; exact native range obscure.

Habitat: Roadside ditches, cultivated areas, and stream banks.

Note: The flowers, leaves, and fruits are all smaller than *L. octovalvis*; the petals are usually round to pointed at tip, never notched.



PRIMROSE-WILLOW

Local Name: None Recorded

Life Form: Herb - Dicot

Ludwigia octovalvis (Jacq.) P.H. Raven

Family: Onagraceae

Wetland Indicator Status: OBL*

Habit: Erect annual 0.6–2 m tall, larger than *L. hyssopifolia*.

Leaves: Alternate, lanceolate to linear, 5–12 x 0.5–2.5 cm.

Flowers: Yellow, with 4 obovate petals that are rounded or notched at the tip; petals fall off by mid-afternoon.

Fruits: An elongated capsule that splits along eight lines to release small black seeds.

Distribution: Native; occurs on Rota, Saipan, Tinian, and Guam. Pantropical.

Habitat: Roadside ditches and pond margins.

Note: The flowers, leaves, and fruits are larger than those of *L. hyssopifolia*; petals usually notched at the tip.



MILE-A-MINUTE

Local Name: None Recorded

Life Form: Herb - Vine

***Mikania micrantha* Kunth**

Family: Asteraceae

Wetland Indicator Status: FAC

Habit: Fast-growing perennial vine that often smothers other plants; stems ribbed.

Leaves: Opposite, glabrous, long-petiolate; blades soft, glabrous, heart- to spear-shaped, 6–13 x 3–7 cm.

Flowers: Borne in terminal clusters of heads, usually 4 flowers per head; individual flowers lacking ray floret, white, about 2 mm long, mildly sweet-scented.

Fruits: A small, longitudinally ribbed achene with long hairs.

Distribution: Introduced; occurs on Rota, Saipan, Tinian, and Guam. Native to America from Mexico to Argentina and widely naturalized in the Old-World tropics and Oceania.

Habitat: Prefers moist, fertile soils, and ample light, yet adaptable to wide range of environments.

Synonym: *Mikania scandens* (L.) Willd.

Note: Often smothering other plants, considered one of the worst invasive weeds globally.



BALSAM APPLE

Local Name: Almagosa, Atmagoso

Life Form: Herb - Vine

Momordica charantia* L.*Family: Cucurbitaceae****Wetland Indicator Status: FAC**

Habit: Climbing annual vine to 5 m long; stems and leaves sparsely to densely hairy.

Leaves: Alternate, palmately 5–7-lobed, 10–12 cm.

Flowers: Axillary, solitary, unisexual; peduncle with a leaf-like bract; corolla yellow, 5-lobed, shallow funnel-shaped, 15–20 × 8–12 mm.

Fruits: A fleshy, obovoid or oblong-cylindrical berry, coarsely ridged and bumpy, orange and splitting open when ripe.

Distribution: Introduced; occurs on Aguijan, Rota, Saipan, Tinian, and Guam. Native to Old-World tropics and Oceania, now naturalized throughout the tropical.

Habitat: Coastal thickets, along creeks and streams, lowland forest margins and shrubland.

Note: Cultivated and naturalized; very common.



COFFEE SENNA

Local Names: Amot Tumag'a, Amot Tumaga, Karabao, Mumutong Sapble, Mumutun Sable

Life Form: Herb - Dicot

Senna occidentalis (L.) Link

Family: Fabaceae

Wetland Indicator Status: FAC*

Habit: Perennial herb, slightly woody, 0.2–2 m tall.

Leaves: Alternate, pinnate; petioles with an ovoid gland near the base; leaflets 5–6 pairs, ovate to ovate-oblong, 4–10 × 2–3.5 cm, rounded at base, acuminate at the tip.

Flowers: In short axillary racemes near the top; 2–3 cm across, with five yellow petals.

Fruits: Pods brown, strap-shaped, slightly bent, 10–13 × 0.8–1 cm; seeds 30–40, flattened.

Distribution: Introduced; occurs on Agrihan, Aguijan, Alamagan, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native to Mexico and Caribbean; widely introduced and naturalized in the tropics.

Habitat: Roadsides, abandoned fields, and recently disturbed places.

Note: It gives off a foul odor when damaged. The seeds can be roasted and brewed like coffee hence the English name.



GIANT TARO

Local Name: Papao-Apaka,
Papao-Atulong, Piga

Life Form: Herb - Monocot

Alocasia macrorrhizos (L.) G. Don

Family: Araceae

Wetland Indicator Status: FAC

Habit: Erect perennial herb up to 3 m tall, with well-developed stem up to 1–2 m above the ground in older plants.

Leaves: Arrowhead-shaped, to 1 m long, with a rounded apex pointing upwards or horizontally, and rounded basal lobes.

Flowers: Inflorescences axillary; spathe (floral bract) 13–35 cm long; spadix (flower spike) slightly shorter than the spathe; flowers sessile, unisexual, female flowers at the base of the spike.

Fruits: Fleshy, tightly packed on the spike, red when ripe.

Distribution: Introduced; occurs on Agrihan, Alamagan, Anatahan, Pagan, Saipan, Sarigan, Tinian, and Guam. Widely distributed in tropical Asia and Pacific islands; exact origin obscure.

Habitat: Cultivated lands, waste places, old gardens, mesic valleys, and disturbed moist lowland and secondary forests.

Synonym: *Alocasia indica* (Lour.) Spach; *A. plumbea* Van Houtte; *Arum indicum* Lour.; *A. macrorrhizon* L.; and *Colocasia indica* (Lour.) Kunth.

Note: *A. macrorrhizos* can be distinguished from *Cyrtosperma merkusii* by its relatively round leaf lobes and smooth petiole.



TARO

Local Name: Suni

Life Form: Herb - Monocot

Colocasia esculenta (L.) Schott

Family: Araceae

Wetland Indicator Status: FACW

Habit: Corm forming perennial, up to 1 m tall.

Leaves: Heart-shaped, peltate, with rounded apex and basal lobes, glaucous, up to 60 cm long; apical lobes and basal lobes round, with the apical lobe pointing downwards.

Flowers: Rarely forming.

Distribution: Introduced; occurs on Alamagan, Anatahan, Pagan, Rota, Saipan, Tinian, and Guam. Widely cultivated throughout the tropics.

Habitat: Streams, marshy areas, and cultivated lands; some varieties can grow in dry places.

Note: Corm and leaves are edible. It can be distinguished from similar arums by its peltate, glaucous leaves.



SWAMP TARO

Local Name: Gallan, Baba

Life Form: Herb - Monocot

Cyrtosperma merkusii (Hassk.) Schott

Family: Araceae

Wetland Indicator Status: OBL

Habit: Large corm-forming perennial up to 4–5 m tall.

Leaves: Petioles prickly, up to 3 m long; leaf blades up to 2 m long, lobes rather pointed, leaf tip pointing upwards.

Flowers: Sessile, borne in an erect, cylindrical, many-flowered spadix shorter than the petioles.

Fruits: A reddish-orange, sessile berry, 1(–2)-seeded.

Distribution: Introduced; occurs on Rota, Saipan, and Guam. Grown throughout Oceania and into South and Southeast Asia.

Habitat: Streams, freshwater swamps, and brackish swamps.

Synonym: *Cyrtosperma chamissonis* (Schott) Merr.

Note: The corm is edible but must be well-cooked. *C. merkusii* can be distinguished from similar arums by its prickly petiole and sharp triangular leaf lobes.



WATER HYACINTH

Local Name: None Recorded

Life Form: Herb - Monocot

Eichhornia crassipes (Mart.) Solms

Family: Pontederiaceae

Wetland Indicator Status: OBL

Habit: Free-floating aquatic plant to 50 cm wide; often connected by runners.

Leaves: Leaf stalks inflated, keeping the plant afloat; blades large, waxy, oval-shaped, slightly cupped, smooth and glossy, up to 10 cm across, entire at margins.

Flowers: Light purple to blue, arranged on a spike; top petal with a yellow center spot surrounded by dark purple lines.

Fruits: Capsules submerged, 3-celled, many-seeded, rarely forming.

Distribution: Introduced; occurs on Rota, Saipan, Tinian, and Guam. Native to Brazil, widely introduced and naturalized in tropical and subtropical regions.

Habitat: Shallow ponds in wetlands and marshes, lakes, reservoirs, and slow-flowing waters.

Note: A very distinctive free-floating plant that reproduces quickly by runners; an invasive weed due to its ability to choke waterways.



SPIDERLILY

Local Name: Lirio

Life Form: Herb - Monocot

Hymenocallis littoralis (Jacq.) Salisb.

Family: Amaryllidaceae

Wetland Indicator Status: FAC

Habit: Bulbous perennial herb.

Leaves: Strap-like, 50–75 x 4 cm, glossy, somewhat fleshy.

Flower: Clustered at the tip of scape, white, fragrant, with a slender tube up to 15 cm long and 6 narrow linear white tepals surrounding a thin disc, where the six stamens up to 5 cm are attached.

Fruits: Capsule, green, smooth, 3-celled.

Distribution: Introduced; occurs on Farallon de Medinilla, the Maug Islands, Pagan, Rota, Saipan, Tinian, and Guam. Native to tropical America; now widely cultivated and naturalized.

Habitat: Wetland edges, coastal areas, preferring sandy soils.

Synonym: *Pancratium littorale* Jacq.

Note: Similar to *Crinum asiaticum*, but with an obvious floral corona of membranous tissue joining the bases of the stamens.



COMMON DUCKWEED

Local Name: None Recorded

Life Form: Herb - Monocot

Lemna perpusilla Torr.

Family: Araceae

Wetland Indicator Status: OBL

Habit: Tiny floating aquatic plant 1.5–4 mm across, with one root trailing below it.

Leaves: Green, small and flat, scale-like, with 1–3 veins, ovate-elliptic, 2–5 mm in diameter.

Flowers: Rarely forming; the plant mostly reproduces vegetatively by budding.

Distribution: Native; occurs on Saipan, Tinian, and Guam. Native to eastern North America.

Habitat: Ponds and lakes.

Note: *Lemna minor* and *L. perpusilla* are very similar, the difference being the presence of a winged root sheath in the latter.



WATER LETTUCE

Local Name: None Recorded

Life Form: Herb - Monocot

Pistia stratiotes L.

Family: Araceae

Wetland Indicator Status: OBL

Habit: Free-floating rosette with feathery roots and runners.

Leaves: In a rosette, fleshy, light green, obovate, up to 14 cm long, densely covered on both sides with hairs that repel water and keep the plant afloat.

Flowers: Unisexual, with 3–8 male and 1 female flower, inconspicuous, borne in an axillary inflorescence 2–4 cm long.

Fruits: Membranous, many-seeded. The plant reproduces mainly vegetatively by runners.

Distribution: Introduced; occurs on Rota and Guam. Found throughout the tropics, often cultivated as an ornamental and animal feed. It is considered among the worst invasive aquatic plants.

Habitat: Ponds, lakes, slow flowing rivers, and sometimes mud.

Note: Like *Eichhornia crassipes*, it often grows in nutrient rich waters and forms dense floating mats that block sunlight and prevents gas exchange.



POORLAND FLATSEEDGE

Local Name: Chaguan Umatak
(*Cyperus* species in general)

Life Form: Herb - Sedge

***Cyperus compressus* L.**

Family: Cyperaceae

Wetland Indicator Status: FAC

Habit: Clump-forming annual sedge with culms up to 40 cm tall.

Leaves: Linear, 1.5–3 mm wide; sheath often reddish.

Flowers: Borne in crowded clusters; spikelets 1–2.5 x 0.3–0.5 cm, 12–30-flowered.

Fruits: Achenes obovoid, brown to almost black, 3-sided.

Distribution: Introduced; occurs on Alamagan, Anatahan, Pagan, Rota, Saipan, Tinian, and Guam. A widely distributed weed throughout the tropics.

Habitat: Moist places that are frequently disturbed, such as irrigated fields, ditches, stream beds, pond margins, and lawns.

Note: It is characterized by its green, relatively large, compressed spikelets 1–2.5 cm long.



OLD-WORLD FLATSEEDGE

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

***Cyperus cyperinus* (Retz.) Sur.**

Family: Cyperaceae

Wetland Indicator Status: FACU*

Habit: Tufted perennial sedge; culms up to 50 cm tall, glabrous, triangular in cross section.

Leaves: Basal leaves many, shorter than the culm, linear, long-acuminate, with rough margins; involucre bracts up to 25 cm long, 2 or 3 per stem.

Flowers: Spikelets in tight clusters on primary or secondary rays, slender, ca. 4.5 mm long, 2- or 3-flowered.

Fruit: Achenes reddish-brown, 3-sided.

Distribution: Introduced; occurs on Agrihan, Alamagan, Anatahan, Asuncion Island, Guguan, Maug Islands, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native to Indomalaysia and the Pacific islands.

Habitat: Disturbed moist to moderately dry areas, common along roadsides and in disturbed areas.

Synonym: *Mariscus cyperinus* (Retz.) Vahl.

Note: It is characterized by its cylindrical spikes with crowded 2- or 3-flowered spikelets ca. 4.5 mm long.



VARIABLE FLATSEDGE

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

***Cyperus difformis* L.**

Family: Cyperaceae

Wetland Indicator Status: OBL*

Habit: Tufted annual sedge up to 50 cm tall; culms solid, glabrous, triangular in cross section, with sharp edges.

Leaves: Basal leaves limp, shorter than the culms, glabrous, linear, 2–6 mm wide; involucre bracts longer than the inflorescence.

Flowers: Borne in long-stalked round clusters; spikelets compressed, narrowly egg-shaped, with reddish markings and light-colored margins, 2–8 × 1–1.2 mm, 8–28-flowered.

Fruit: Achene less than 1 mm long, 3-sided.

Distribution: Introduced; occurs on Saipan and Guam. A widespread weed native to Old-World tropics and Oceania; also naturalized in tropical America.

Habitat: Wet places, swamps, temporary pools, and rice fields.

Note: It is characterized by its round spikes of clustered spikelets with brown markings and light-colored margins.



UMBRELLA SEDGE

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

Cyperus involucratus Rottb.

Family: Cyperaceae

Wetland Indicator Status: FACW

Habit: Clumping perennial sedge up to 1.5 m tall; culms slightly triangular in cross section.

Leaves: Basal leaves reduced to bladeless sheaths; involuclral bracts linear, up to 30 x 1.2 cm, spirally arranged at the top of the culm, making an umbrella-like appearance.

Flowers: Borne in clusters on numerous rays up to 10 cm long; spikelets narrowly ovoid or oblong, 3–12 x 1.5–3 mm.

Fruits: Achenes brown at maturity, 0.5–0.6 mm long, 3-sided.

Distribution: Introduced; occurs on Saipan and Guam. Native to East Africa and Southwest Asia. Widely cultivated and naturalized.

Habitat: Streams, marshes, and other damp areas.

Synonym: *Cyperus alternifolius* auct. non L.; *C. alternifolius* L. ssp. *flabelliformis* (Rottb.) Kük.; and *C. flabelliformis* Rottb.

Note: It is easily identified by its unique umbrella-like appearance composed of numerous involuclral bracts similar in length.



RICE FLATSEEDGE

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

Cyperus iria L.

Family: Cyperaceae

Wetland Indicator Status: FACW

Habit: Clumping annual sedge; culms up to 60 cm tall, triangular in cross section.

Leaves: Basal leaves short and narrow; involucre bracts droopy, longer than the inflorescence.

Flowers: Inflorescence branched, golden or yellowish-green, comprising several branched spikes; spikelets 5–8 mm long.

Fruits: Achenes narrowly obovoid, yellow-brown, 3-sided.

Distribution: Introduced; occurs on Saipan and Guam. Native to tropical and temperate Asia, tropical East Africa, Australia, and Pacific Islands.

Habitat: Cultivated damp areas and ditches.

Note: A weedy annual sedge common in wet field and ditches. It is characterized by its annual habit and fibrous roots. Few-flowered spikelets 5–8 mm long, with round or slightly notched glumes 1–1.5 mm long.



JAVANESE FLATSEEDGE

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

Cyperus javanicus Houtt.

Family: Cyperaceae

Wetland Indicator Status: FAC

Habit: Clumping perennial sedge up to 1 m tall; culms triangular in cross-section.

Leaves: Basal leaves firm, up to 7 mm wide, some leaves longer than the culms, glaucous, sharp edged; involucre bracts several, elongated.

Flowers: Inflorescence with branched rays up to 10 cm long; spikes to nearly 2.5 cm long; spikelets compressed, narrowly oblong-ovoid, 4.5–7 × 1.8–2.5 mm, 6–8-flowered.

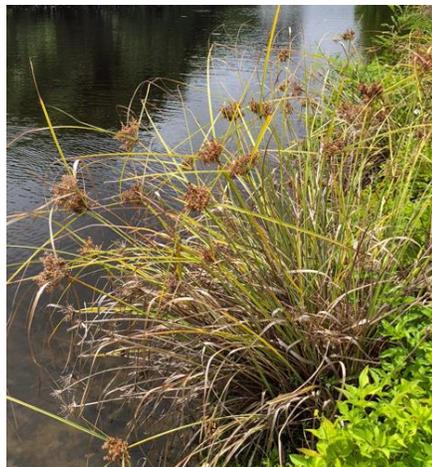
Fruits: Achenes dark brown to black, ovoid, 3-sided.

Distribution: Native; occurs throughout the Mariana Islands. Native to India, Southeast Asia, northern Australia, Indian Ocean islands, Madagascar, and Pacific islands.

Habitat: Coastal marshes and mangrove edges. Common in coastal wetlands and streams with some salinity.

Synonym: *Mariscus javanicus* (Houtt.) Merr. & Metcalfe.

Note: It is characterized by its flattened, light brown or straw-colored, 6–7 mm long spikelets that are rather crowded but do not conceal axis.



ROCKET SEDGE

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

***Cyperus ligularis* L.**

Family: Cyperaceae

Wetland Indicator Status: FAC

Habit: Robust perennial sedge up to 30–80 cm tall; culms slightly triangular in cross section.

Leaves: Basal leaves longer than the culm, gray-green, with sharp margins; involucre bracts 4–6.

Flowers: Inflorescence umbel-like, bearing 7–12 primary rays; spikelets cylindrical, reddish-brown.

Fruits: Achenes dark brown, ca. 1.5 mm long, 3-sided.

Distribution: Introduced; occurs on Saipan and Guam. Native to tropical America and Africa, including Madagascar.

Habitat: Coastal wet areas.

Synonym: *Mariscus ligularis* (L.) Urb.

Note: It is characterized by its dense, short branched, somewhat cylindrical spikes with reddish brown spikelets in tight clusters.



FRAGRANT FLATSEEDGE

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

***Cyperus odoratus* L.**

Family: Cyperaceae

Wetland Indicator Status: FACW*

Habit: Annual sedge up to 1 m tall, culms 1 to several, stout, glabrous, triangular in cross section.

Leaves: Basal leaves shorter than culm, 5–12 mm wide; involucre bracts spreading, longer than inflorescence.

Flowers: Inflorescence loosely branched, 15–20 cm long; spikelets linear, cylindrical, 8–25 × 1 mm, 10–25-flowered.

Fruits: Achenes dark brown, ca. 2 mm long, 3-sided.

Distribution: Native; occurs on Saipan, Tinian, and Guam. Pantropical.

Habitat: Freshwater marshes, roadside ditches, stream banks, and cultivated areas.

Synonyms: *Cyperus ferax* Rich.; *Mariscus ferax* (Rich.) C. Clarke; *Torulinium ferax* (Rich.) Hamilton; *T. odoratum* (L.) S. S. Hooper.

Note: It is characterized by its loosely branched spike with long linear spikelets that break into segments at maturity.



MANY SPIKE FLATSEEDGE

Local Name: Chaguan Umatak
(*Cyperus* species in general)

Life Form: Herb - Sedge

Cyperus polystachyos Rottb.

Family: Cyperaceae

Wetland Indicator Status: FACW*

Habit: Annual or short-lived, tufted perennial sedge; culms up to 80 cm tall, triangular in cross-section.

Leaves: Basal leaves shorter than culms; blades up to 5 mm wide; involucre bracts of variable length.

Flowers: Borne in compact clusters up to 5 cm across, on short rays; spikelets compressed, up to 1.5 cm long, aging from green to brown.

Fruits: Achenes nearly black, ca. 1 mm long, 2-sided.

Distribution: Native; occurs on Agrihan, Alamagan, Pagan, Rota, Saipan, Tinian, and Guam. Pan-tropical.

Habitat: Seasonally wet areas, shores of rivers or lakes, and edges of wetlands.

Synonym: *Pycneus polystachyos* (Rottb.) P. Beauv.

Note: It is characterized by its yellowish brown, strongly compressed spikelets up to 1.5 cm long, in dense terminal clusters or at the ends of the rays.



NUTGRASS

Local Name: Chaguan Umatak
(sedges in general)

Life Form: Herb - Sedge

***Cyperus rotundus* L.**

Family: Cyperaceae

Wetland Indicator Status: FAC

Habit: Perennial sedge with long subterranean rhizomes and small tubers; culms up to 60 cm tall.

Leaves: Sheaths reddish brown at the base; blades 2–6 mm wide; involucre bracts 2 or 3 (rarely up to 5).

Flowers: Spikelets on rays up to 6 cm long, purplish, linear, 1–2 cm long, 12–30-flowered.

Fruits: Achenes black, sub-obovoid, 1.5 mm long, 3-sided.

Distribution: Introduced; occurs on Pagan, Rota, Saipan, Tinian, and Guam. Cosmopolitan in distribution.

Habitat: Often in lawns and cultivated or fallow fields that are seasonally moist.

Note: A common weed that spreads by underground runners and is difficult to remove. The tubers are edible and are used in folk medicine.



SPIKERUSH

Local Name: None Recorded

Life Form: Herb - Sedge

Eleocharis geniculata (L.) Roem. & Schult.

Family: Cyperaceae

Wetland Indicator Status: OBL*

Habit: Tufted sedge up to 30 cm tall.

Leaves: Leaf sheath without a blade, reddish and apically straw-colored, to 1.5 cm long.

Flowers: One spikelet per culm, globose to ovoid, 3–5 × 3–3.5 mm, many flowered.

Fruits: Achenes brown, ca. 1 mm long, with 5–8 bristles.

Distribution: Native; occurs on Rota, Saipan, and Guam. Pantropical.

Habitat: Shallow waters and edge of lakes, sometimes in brackish water by the sea.

Synonyms: *Scirpus geniculatus* L.; *S. capitatus* L.; *E. capitata* (L.) R.Br.; *E. atropurpurea* sensu J. & C. Presl.

Note: It is characterized by its densely tufted leafless culms with a single ovoid spikelet at the top.



BUTTON SEDGE

Local Name: None Recorded

Life Form: Herb - Sedge

Fimbristylis cymosa R. Br.

Family: Cyperaceae

Wetland Indicator Status: FAC

Habit: Clumping sedge, culms up to 60 cm tall.

Leaves: Basal leaves crowded at the base, spreading to erect; blades linear, 1–4 mm wide, up to 30 cm long.

Flowers: Inflorescence open and branched (var. *spathacea*) or congested and head-like (ssp. *umbellatocapitata*) on 3–8 primary rays, 1–4 cm long; spikelets oblong or ovoid.

Fruits: Achenes grayish or dark brown, 2-sided (var. *spathacea*) or 3-sided (ssp. *umbellatocapitata*).

Distribution: Native; occurs throughout the Mariana Islands. Native to the Old-World tropics and Oceania.

Habitat: Rocky or sandy coastlines.

Synonyms: *Fimbristylis atollensis* H. St. John; *F. cymosa* R. Br. ssp. *spathacea* (Roth) T. Koyama; *F. spathacea* Roth.

Note: Two taxa are often recognized: *F. cymosa* var. *spathacea* has 2-forked styles, spikelets in open branched inflorescences; and *F. cymosa* ssp. *umbellatocapitata* with 3-forked styles and spikelets crowded in a globose head.



COMMON FRINGED-RUSH

Local Name: None Recorded

Life Form: Herb - Sedge

Fimbristylis dichotoma (L.) Vahl

Family: Cyperaceae

Wetland Indicator Status: FAC

Habit: Tufted annual or perennial sedge up to 60 cm tall.

Leaves: Basal leaves glabrous except for dense short hairs along the margins, rounded at the apex; ligule of dense hairs.

Flowers: Inflorescence of many spikelets arranged in 2–3-divided branches; main bracts leafy, 2–10 cm long; lowest bract of the spikelets reddish brown, ca. 2 mm long.

Fruits: Achenes 2-sided, lens-shaped.

Distribution: Native; occurs on Agrihan, Alamagan, Anatahan, Pagan, Rota, Saipan, Sarigan, and Guam. Pantropical.

Habitat: Freshwater marshes, drainage edges, and grassy roadsides.

Synonym: *Fimbristylis diphylla* (Retz.) Vahl; *Scirpus dichotomus* L.

Note: It can be distinguished by its ovoid spikelets with reddish brown markings, green keel, and 2-forked styles.



YEFEN

Local Name: None Recorded

Life Form: Herb - Sedge

***Fuirena umbellata* Rottb.**

Family: Cyperaceae

Wetland Indicator Status: OBL

Habit: Perennial herb up to 1.5 m tall; culms from creeping rhizomes, pentagonal, leafy, hairy.

Leaves: Alternate, with an obvious membranous ligule, blades spreading, linear, long-hairy, up to 20 x 1.3 cm, with clear ridges along the veins.

Flowers: Inflorescence branched, both terminal and axillary; spikelets clustered, soft hairy, to 6 mm long; glumes projecting beyond the rounded, 2-lobed apex.

Fruits: Achenes brown, obovoid, with blunt tips, 3-sided.

Distribution: Native; occurs on Rota, Saipan, and Guam. Pantropical.

Habitat: Freshwater wetlands, mostly on volcanic soils.

Synonym: *Scirpus fuirena* T. Koyama.

Note: Uncommon in Mariana Islands. It is characterized by its pentagonal culms that are leafy, blades with many ridges, and spikelets with projecting glumes.



SHORT-LEAF SPIKESEDGE

Local Name: None Recorded

Life Form: Herb - Sedge

Kyllinga brevifolia Rottb.

Family: Cyperaceae

Wetland Indicator Status: FAC*

Habit: Small, creeping perennial sedge up to 30 cm tall.

Leaves: Basal leaves shorter than the flower stem; blades 5–15 × 0.2–0.4 mm; involucre bracts 3–5, of different lengths.

Flowers: Inflorescence head-like, 5–10 mm in diameter, with numerous densely arranged spikelets; spikelets pale green, compressed, ca. 3 × 1 mm.

Fruits: Achenes pale brown, elliptic, 1–1.5 mm long, 2-sided.

Distribution: Native; occurs on Agrihan, Anatahan, Pagan, Rota, Saipan, Tinian, and Guam. Pantropical.

Habitat: Freshwater marshes, wet lawns, ditches, and roadsides.

Synonym: *Cyperus brevifolius* (Rottb.) Hassk.

Note: Very common in grassy areas and ditches. Propagates by seeds or rhizomes.



WHITE-HEAD SPIKESEDGE

Local Name: Chaguan Lemai

Life Form: Herb - Sedge

Kyllinga nemoralis

(J.R. & G. Forst.) Dandy ex Hutch. & Dalziel

Family: Cyperaceae

Wetland Indicator Status: FAC*

Habit: Small creeping perennial sedge; culms to 30 cm tall.

Leaves: Basal leaves 1.5–3 mm wide, usually shorter than the culms; involucre bracts 3 or 4, up to 20 cm long.

Flowers: Single (or occasionally to 3), white rounded flower heads 5–10 mm in diameter, of many spikelets; spikelets white, compressed, sub-obovoid, 2.5–3.5 × 1.5 mm.

Fruits: Achenes brown or black, compressed.

Distribution: Native; occurs on Agrihan, Alamagan, Anatahan, Rota, Saipan, Sarigan, Tinian, and Guam. Pantropical in distribution.

Habitat: Freshwater marshes, wet lawns, ditches, and roadsides. It grows best in moist fertile soil and full sun.

Synonym: *Cyperus kyllingia* Endl.

Note: It is similar to *K. brevifolia* vegetatively but is unmistakable with its white head-like spikes.



BULRUSH

Local Name: None Recorded

Life Form: Herb - Sedge

Schoenoplectus subulatus (Vahl) Lye

Family: Cyperaceae

Wetland Indicator Status: OBL

Habit: Tufted perennial sedge up to 120 cm tall; culm round to slightly 3-angled.

Leaves: Bladeless leaves reduced to basal sheaths that wrap around the base of the culm.

Flowers: Borne in loose clusters near the tip of the stem; spikelets ovate to oblong, 7–12 x 3–4 mm, rusty-brown.

Fruits: Achenes broadly obovate, ca. 2 x 1.5 mm, brown, 2-sided.

Distribution: Native; occurs on Saipan, Tinian, and Guam. Native to Indomalaysia and the Pacific islands.

Habitat: Brackish river mouths, coastal marshes, ponds, and swamps.

Synonyms: *Schoenoplectus litoralis* auct. non (Schrad.) Palla; *Scirpus litoralis* Schrad.; *Scirpus litoralis* Schrad. var. *capensis* (Boeckeler) T. Koyama.; *Scirpus litoralis* Schrad. var. *thermalis* (Trabut) T. Koyama.

Note: An important component of tidal marshes, often forming dense, pure stands.



NUTRUSH

Local Name: None Recorded

Life Form: Herb - Sedge

Scleria polycarpa Boeck.

Family: Cyperaceae

Wetland Indicator Status: FAC

Habit: Tufted perennial sedge; culms stout, to 1 m tall, triangular in cross section.

Leaves: Spaced along the culms, usually in whorls or clusters, 6–12 mm wide.

Flowers: In terminal and axillary panicles, unisexual.

Fruits: Nut white, smooth, on a distinct stalk at the base.

Distribution: Native; occurs on Saipan and Guam. Native to Southeast Asia and Oceania.

Habitat: Around freshwater marshes and abandoned cultivated areas.

Synonym: *Scleria micrantha* C. B. Clarke.

Note: *S. lithosperma* is smaller, with narrower leaves (< 5 mm wide), simple unbranched spikes, and sessile fruits.



PARA GRASS

Local Name: None Recorded

Life Form: Herb - Grass

Brachiaria mutica (Forssk.) Stapf

Family: Poaceae

Wetland Indicator Status: FACW

Habit: Robust perennial grass to 2.4 m tall; stem trailing and ascending, densely hairy at the nodes.

Leaves: Leaf sheath stiff-hairy; leaf blades glabrous, lanceolate, 10–30 x 1–2 cm.

Flowers: Spikelets elliptic, green or purplish, 2.5–3.5 mm long, borne in a many-branched inflorescence up to 30 cm long.

Distribution: Introduced; occurs on Saipan and Guam. Native to northern and central Africa and parts of the Middle East, widely cultivated and naturalized throughout tropical regions.

Habitat: Wet fields, ditches, gullies, and water edges.

Synonyms: *Panicum muticum* Forssk.; *P. purpurascens* Raddi, *P. barbinode* Trin, and *Urochloa mutica* (Forssk.) T.Q. Nguyen,

Note: An invasive species in many Pacific Islands and Pacific Rim countries. Quickly forms a dense cover in wet places.



BARBED GRASS

Local Name: None Recorded

Life Form: Herb - Grass

Centotheca lappacea (L.) Desv.

Family: Poaceae

Wetland Indicator Status: FACU*

Habit: Perennial grass; culm solitary or loosely tufted, erect, 40–100 cm tall.

Leaves: Leaf blade lanceolate, 5–25 x 1.2–2.5 cm; base asymmetrical; surfaces glabrous or soft-hairy, often wavy.

Flowers: Borne in an ovate-shaped panicle 10–25 cm long; spikelets ca. 5 mm long, with 2 or 3 florets.

Fruits: Achenes ellipsoid, 1–1.2 mm with spines that catch on clothing and on the fur of passing animals.

Distribution: Native; occurs on Anatahan, Rota, Saipan, and Guam. Native from West Africa to Polynesia.

Habitat: Forest margins, shaded roadsides, and moist shady areas.

Note: Considered to be good fodder.



JOB'S TEARS

Local Name: Bilen

Life Form: Herb - Grass

Coix lacryma-jobi L.

Family: Poaceae

Wetland Indicator Status: FACW

Habit: Robust annual grass with branching culms up to 1.5 m tall.

Leaves: Leaf blades up to 50 x 4 cm; leaf base rounded to clasping.

Flowers: Unisexual, female spikelets enclosed in a spherical gray or white bead-like false fruit about 1 cm long; staminate (male) spikelets emerging from the apical opening of the false fruit.

Fruits: Achenes enclosed in the bead-like false fruits.

Distribution: Introduced; occurs on Rota, Saipan, Tinian, and Guam. Native to Southeast Asia.

Habitat: Ravines, freshwater marshes, and ditches.

Note: The bead-like false fruits are used as beads to make rosaries and other ornaments. Some forms are cultivated for their edible grains.



JUNGLE RICE

Local Name: Chaguan-Agaga

Life Form: Herb - Grass

Echinochloa colona (L.) Link

Family: Poaceae

Wetland Indicator Status: FACW*

Habit: Tufted annual grass 15–60 cm tall; culms glabrous, branched, green to reddish-purple, swollen at the joints.

Leaves: Leaf blades 4–20 x 0.3–1 cm, green with purple edges.

Flowers: Borne on an inflorescence 5–15 cm, with 4–7 alternating, one-sided racemes, each 1–3 cm long, with 4 rows of densely packed, green to reddish purple spikelets.

Distribution: Introduced; occurs on Rota, Saipan, Tinian, and Guam. Native to tropical Asia, now considered invasive in the Americas and Australia.

Habitat: Roadside ditches, drains, moist ground, and disturbed areas.

Synonyms: *Panicum colonum* L.; *Echinochloa crusgalli* (L.) P. Beauv. ssp. *colona* (L.) Honda; *Oplismenus colonum* (L.) Kunth.

Note: A common weed in wet areas. The seeds are edible.



GOOSE GRASS

Local Name: Umog

Life Form: Herb - Grass

Eleusine indica (L.) Gaertn.

Family: Poaceae

Wetland Indicator Status: FACU*

Habit: Erect or prostrate annual grass up to 1 m tall; culms flattened.

Leaves: Blades 4–6 mm wide, up to 30 cm long, with entire margins.

Flowers: Borne in 2–6 spikes at the apex of the culm, often one slightly below the apex; spikelets few-flowered, up to 6 mm long.

Fruits: Achenes blackish, oblong to ovate.

Distribution: Introduced; occurs on Agrihan, Alamagan, Anatahan, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native to the Old-World tropics, now pantropical.

Habitat: Disturbed open habitats, lawns, fields, and roadsides.

Note: This grass can be distinguished by its compressed stems and leaf sheaths, and digitate inflorescence branches with one attached below the others.



GUINEA GRASS

Local Name: None Recorded

Life Form: Herb - Grass

Panicum maximum Jacq.

Family: Poaceae

Wetland Indicator Status: FACU

Habit: Tufted perennial grass, up to 3–4 m tall.

Leaves: Blades linear, 15–100 x 1.5–3.5 cm, margins rough.

Flowers: Spikelets glabrous, oblong, plump, 2.5–4 mm long; first glume < 1/3 length of the spikelet, borne in a much-branched panicle up to 60 cm long.

Distribution: Introduced; occurs on the Maug Islands, Rota, Saipan, Tinian, and Guam. Native to Africa, widely naturalized in tropics.

Habitat: Disturbed grasslands and shrublands, riverbanks, and wetland margins. A resilient species that can withstand wildfire and drought.

Synonyms: *Urochloa maxima* (Jacq.) R. Webster; *Megathyrsus maximus* (Jacq.) B.K. Simon & Jacobs.

Note: Vegetatively it resembles *Pennisetum purpurea*, but with an open branched inflorescence instead of a dense, elongated spike.



HILO GRASS

Local Name: None Recorded

Life Form: Herb - Grass

Paspalum conjugatum P.J. Bergius

Family: Poaceae

Wetland Indicator Status: FAC*

Habit: Creeping perennial grass, up to 50 cm tall, rooting at the lower nodes.

Leaves: Leaf blades thin, glabrous, linear-lanceolate, 5–20 × 0.5–1 cm.

Flowers: Spikelets borne on a pair of terminal racemes, each up to 12 cm long, spreading to a distinct Y-shape.

Distribution: Introduced; occurs on Agrihan, Aguijan, Alamagan, Anatahan, Pagan, Rota, Saipan, Sarigan, Tinian, and Guam. Native to South America but now pantropical.

Habitat: Forest margins, wetland edges, cultivated fields, pastures, roadsides, and ditches.

Note: Easily recognized by its Y-shaped inflorescence comprising a pair of widely spreading racemes with numerous small, round spikelets.



MISSION GRASS

Local Name: None Recorded

Life Form: Herb - Grass

Pennisetum polystachion (L.) Schult.

Family: Poaceae

Wetland Indicator Status: FACU*

Habit: Tufted annual grass, sometimes with stolons; culms up to 2 m tall.

Leaves: Leaf blades linear, more or less hairy, 5–40 x 0.5–1.8 cm; base of the blade hairy near the sheath collar and on its rim.

Flowers: Spikes elongate, yellow brown, 5–25 x 1.3–2.6 cm; spikelets ca. 5 mm long, surrounded by bristles of different lengths.

Distribution: Introduced; occurs on Rota, Saipan, Tinian, and Guam. Native to tropical Africa to India, commonly naturalized in the tropics.

Habitat: Found mostly in disturbed dry, lowland areas and cultivated fields.

Synonyms: *Cenchrus setosus* Sw.; *Panicum polystachion* L.; and *Pennisetum setosum* (Sw.) Rich.

Note: The seeds sometimes germinate before dispersal



TALL REED

Local Name: Karriso, Karisu

Life Form: Herb - Grass

Phragmites karka (Retz.) Trin. ex Steud.

Family: Poaceae

Wetland Indicator Status: OBL

Habit: Robust reed up to 5m in height.

Leaves: Alternate in two rows on opposite sides of the stem; leaf blades long-lanceolate, up to ca. 80 × 2–3 cm.

Flowers: Large feather-duster type of inflorescence 30–70 cm long; spikelets 5–8 mm long.

Distribution: Native; occurs on Rota, Saipan, Tinian, and Guam. Widely distributed through tropical Africa, tropical and subtropical Asia to New Guinea, Australia, and the Pacific.

Habitat: Freshwater and brackish marshes, swamps, and ditches.

Note: Very common and forming dense monocultures in wetlands. It covers extensive areas surrounding Lake Susupe, also in the Oleai and Tanapag areas.



WILDCANE

Local Name: None Recorded

Life Form: Herb - Grass

Saccharum spontaneum L.

Family: Poaceae

Wetland Indicator Status: FACU

Habit: Clumping perennial grass up to 3 m tall, often in large clumps; culms 0.4–1 cm in diameter with bearded nodes.

Leaves: Sheaths long-hairy at the mouth and margins; blades 60–180 × 0.2–0.8 cm, glaucous, finely serrated at the margins, long-tapering at the tips.

Flowers: Spikelets 3–4 mm long, surrounded by hairs 3–4 times the length of the spikelet; inflorescence finely branched, 20–40 cm long, with long silky hairs.

Fruits: Achenes surrounded by many long silky hairs; the rachis breaks up into many segments at maturity.

Distribution: Introduced; occurs on Saipan, Tinian, and Guam. Widely distributed in tropical and subtropical regions of Asia.

Habitat: A pioneer species in grasslands, forest openings, and exposed stream beds.

Note: Purposely introduced to Saipan by the Japanese sugar companies for experimentation. It is similar to sword grass (*Miscanthus floridulus*) which has wider leaf blades (up to 3 cm) and a persistent rachis not breaking up into segments.



SEASHORE DROPSEED

Local Name: Totopot

Life Form: Herb - Grass

Sporobolus virginicus (L.) Kunth

Family: Poaceae

Wetland Indicator Status: FAC

Habit: Creeping perennial grass, with long rhizomes.

Leaves: Alternate, arranged in two rows; blade lanceolate, in-rolled, 3–10 × 0.1–0.3 cm, rigid, sharp at the tip.

Flowers: Borne in a spike-like panicle tapering at both ends, usually less than 7.5 cm long; spikelets pale, ca. 4 mm long.

Fruits: Globose achenes ca. 0.7 mm in diameter.

Distribution: Native; occurs on Asuncion, Farallon de Pajaros, Maug Islands, Pagan, Saipan, Tinian, and Guam. Widely distributed from warm temperate to tropical regions of the world.

Habitat: Sandy or pebbly beaches, tidal flats, and salt marshes.

Synonym: *Agrostis virginica* L.

Note: An important native, sand-binding, pioneer grass forming a groundcover close to the ocean.



GLOSSARY

achene	a small, dry, one-seeded fruit that does not open to release the seed	culm	a monocotyledonous stem (as of a grass or sedge)
auriculate	with ear-like lobes	cyme	a flower cluster with a central stem bearing a single terminal flower that develops first, the other flowers in the cluster developing as terminal buds of lateral stems
axillary	arising from an axil; for example, an axillary bud arises in the axil between the stem and the petiole	drupe	a fleshy fruit with thin skin and a hardened center containing the seed, e.g., a plum, cherry, almond, or olive
axis	central vertical portion of a structure, to which other parts are attached	frond	the leaf or leaf-like part of a palm, fern, or similar plant
bipinnate	having leaflets that are further subdivided in a pinnate arrangement	glabrous	smooth, hairless
calyx	the outer whorl of a flower, consisting of separate or fused sepals	glaucous	covered with a whitish, wax-like substance that can be rubbed off
coriaceous	resembling or having the texture of leather	globose	ball-shaped
corolla	the part of a flower that consists of the separate or fused petals and constitutes the inner whorl of the perianth		

hastate	having a narrow triangular shape like that of a spearhead	obtuse	not sharp-pointed or sharp-edged; blunt
herb	a non-woody plant; large as well as small plants may be herbaceous	ovoid	egg-shaped
inflorescence	branched or unbranched axis upon which flowers are arranged	panicle	a compound raceme in which the primary branches are racemose
involucre	one or more whorls of bracts situated below and close to a flower, flower cluster, or fruit	pappus	a modified calyx of hairs, scales, or bristles typical of many Asteraceae
lanceolate	shaped like the head of a lance; of a narrow oval shape tapering to a point at each end	peduncle	the stalk of an inflorescence
ligule	a membranous scale on the inner side of the leaf sheath at its junction with the blade	peltate	Referring to a leaf blade attached to the petiole by its lower surface rather than its margin
oblong	having an elongated shape, as a rectangle or an oval	perianth	the outer part of a flower, consisting of the calyx (sepals) and corolla (petals) or tepals when there is no differentiation between petals and sepals
obovoid	ovoid with the broad end toward the apex	pinna (pl. pinnae)	a primary division of a pinnate leaf, especially of a fern

pinnate	having leaflets arranged on either side of the rachis in feather-like fashion	scape	a long, leafless flower stalk coming directly from a root
pubescent	covered with fine, soft, short hairs	serrate	having or forming a row of small, sharp projections resembling the teeth of a saw
puberulent	minutely pubescent; covered with fine soft hairs or down	spadix	a spike of minute flowers closely arranged around a fleshy axis and typically enclosed in a spathe, characteristic of the arums
raceme	an indeterminate inflorescence with stalked flowers borne on an unbranched elongated central axis	spathe	a large sheathing bract enclosing the flower cluster of certain plants, especially the spadix of arums and palms
rachis	the axis of a compound leaf (excluding the petiole) or of an inflorescence (excluding the peduncle)	spathulate	shaped like a spoon
ray	in Cyperaceae, a secondary axis or stalk of a compound inflorescence	spike	an indeterminate, unbranched inflorescence with sessile flowers and the uppermost flowers the youngest
rosette	a rose-like cluster of parts, especially a radiating arrangement of horizontally spreading leaves at the base of a low-growing plant		

spikelet	a small secondary spike, such as the basic unit of the inflorescence of grasses or sedges	tree	an erect, usually single-stemmed, woody plant 5 centimeters or more diameter at breast height (dbh)
stipule	a reduced leaf-like or bract-like appendage, either solitary or paired, inserted at the base of the petiole of some species and variable in morphology	tufted	occurring in dense clusters
subglobose	imperfectly or nearly globose	umbel	a flower cluster in which stalks of nearly equal length arise from a common center and form a flat or curved surface
sessile	not quite directly attached by the base	viviparous	(of a plant) reproducing from buds that form plantlets while still attached to the parent plant, or from seeds that germinate within the fruit
subshrub	a perennial plant that is intermediate between an herb and a shrub and slightly woody only at the base		
tendrils	a slender threadlike appendage of a climbing plant, often growing in a spiral form, that stretches out and twines around any suitable support		

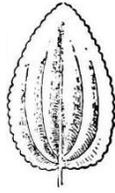
Leaf Shape



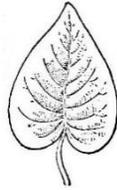
linear



lanceolate



ovate



cordate



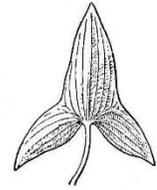
obovate



spathulate



peltate



sagittate

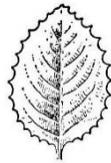
Leaf Margin



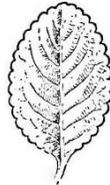
entire



serrate



dentate



crenate



undulate



lobed



double serrate

Simple and Compound Leaf



simple



trifoliate



palmately
compound



pinnately
compound



bipinnately
compound

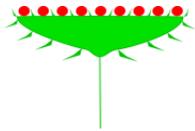
Inflorescence



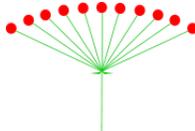
raceme



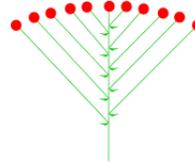
spike



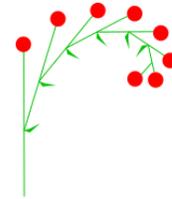
head



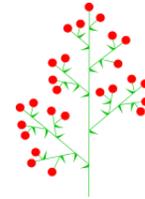
umbel



corymb



scorpioid cyme



panicle

RESOURCES

- Rapid Assessment Methodology for Wetlands Assessment in CNMI, 2015
- Rapid Assessment Methodology – Supplemental CNMI Stream Visual Assessment Protocol, 2018
- U.S. Army Corps of Engineers – Regional Supplement for Hawaii and the Pacific Islands, 2012 DATA SHEET
- Wetland Buffers to Protect “Environmentally Sensitive Areas” and Ensure “No Net Loss”, 2017
- Wetland / Waters Delineation Report Contents – Guidance for the CNMI, 2017

The collage features three main components:

- Manual Cover:** 'Rapid Assessment Method User's Manual' for the Commonwealth of the Northern Mariana Islands, showing a wetland landscape.
- Form:** 'WETLAND DETERMINATION DATA FORM - Hawaii and Pacific Islands Region'. It includes fields for project details, site characteristics, and a 'SUMMARY OF FINDINGS' section with checkboxes for hydrophytic vegetation, hydrophilic soils, and hydrology. It also has a 'VEGETATION' section for recording plant species.
- Website Screenshot:** A page from the U.S. Army Corps of Engineers website titled 'Wetlands, Streams, and Mangroves Publications'. It lists various reports and provides links to download them.

Please visit www.dcrm.gov.mp for these and more wetland resources and publications.

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