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SERVICE

Common Plants of Midway Atoll NWR





Midway Atoll NWR
Battle of Midway National Memorial

This book is a basic guide to common native, non-native, and invasive weed species found throughout Midway Atoll NWR. In addition, this book includes invasive weed species that are either on the Refuge's Watch List or nearly eradicated. Although these species may not be as common as others, they are included because they are species that are actively monitored and controlled. This book is not a comprehensive field guide and does not contain accounts for every species occurring throughout the atoll. For a complete list of Midway Atoll NWR's species, refer to botanical survey reports from Forest and Kim Starr.

Photos used in this book are accredited to: Forest and Kim Starr, Wieteke Holthuijzen, Penny Knuckles, and Meg Duhr-Schultz.

This book was compiled by USFWS Volunteer Wieteke Holthuijzen, with invaluable input and support from various Midway Atoll NWR staff, volunteers, and supporters, especially Greg Schubert, Penny Knuckles, Meg Duhr-Schultz, Ann Humphrey, Bret Wolfe, Dan Clark, and Forest and Kim Starr.

Updated June 2015

Quick Reference

6-Letter Code	Latin Name	Common Name(s)	Page Number
Grasses and Sedges			
ANDGLO	<i>Andropogon glomeratus</i>	Yellow Bluestem/Bushy Beardgrass	25
BROCAT	<i>Bromus catharticus</i>	Prairie Grass/Rescue Grass	26
CENCIL	<i>Cenchrus ciliaris</i>	Buffel Grass	27
CYNDAC	<i>Cynodon dactylon</i>	Bermuda Grass	28
DACAEG	<i>Dactyloctenium aegyptium</i>	Beach Wiregrass	29
ELEIND	<i>Eleusine indica</i>	Goose Grass	30
ERAAMA	<i>Eragrostis amabilis</i>	Love Grass/Tenella	31
ERAPAU	<i>Eragrostis paupera</i>	Dwarf Eragrostis	32
ERAVAR	<i>Eragrostis variabilis</i>	Bunchgrass	33
EUSPET	<i>Eustachys petraea</i>	Finger Grass	34
LEPREP	<i>Lepturus repens</i>	Lepturus	35
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SPOVIR	<i>Sporobolus virginicus</i>	'Aki'aki Grass/Beach Dropseed	40
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CHEOAH	<i>Chenopodium oahuense</i>	'Aweoweo	74
CONBON	<i>Conyza bonariensis</i>	Hairy Horseweed	119
CONCAN	<i>Conyza canadensis</i>	Horseweed	120
CORDID	<i>Coronopus didymus</i>	Lesser Swinecress	91
EPIPIN	<i>Epipremnum pinnatum</i>	Golden Pothos/Taro Vine	55
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MALPAR	<i>Malva parviflora</i>	Cheese Weed	81
MALCOR	<i>Malvastrum coromandelianum</i>	Threelobe False Mallow	82
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Glossary of Selected Botanical Terms

Alternately arranged: Arranged singly at each node, particularly leaves or buds on different sides of a stem.

Anther: The part of the stamen which bears the pollen in a flower.

Ascending: Growing on a slant at first, but becoming upright.

Apex: The point of culmination (the tip or end of a structure); the highest point.

Appressed: Lying flat or pressed closely to a surface but not joined to it.

Awn: A slender bristle-like structure that is usually rigid in nature.

Axil: The upper angle between a leaf stalk and the stem that bears it.

Axillary: located or occurring in an axil.

Bract: A small leaf-like structure usually found underlying another plant structure (e.g. flower).

Bristle: A stiff hair-like structure.

Cordate: Heart-shaped in outline.

Cotyledon: The first leaf, or one of the first pair of leaves, of a seedling; a seed leaf.

Culm: The upright stem of a grass or similar plant; the flowering stem of a grass plant.

Cuneate: Wedge-shaped; triangular, but narrower at the base and wider at the tip.

Cyathium: An inflorescence consisting of a cuplike structure enclosing a female flower and several male flowers that is only found in some members of the Spurge Family (Euphorbiaceae).

Decussate: Arranged along the stem in pairs (oppositely arranged), with each pair at right angles to the pair below.

Dicot: Having two seed leaves.

Drupe: A fruit with a stony center (which contains a single seed) surrounded by a fleshy layer and a skin that does not open at maturity

Epiphyte: A plant which grows on another plant, but does not obtain nourishment from it.

Fascicle: A dense bundle or cluster.

Glabrous: Hairless; without hairs or similar structures.

Glaucous: Having a pale bluish-green or greyish coloration.

Inflorescence: A term that describes the arrangement of flowers as a group or cluster on the flowering part of a plant; the seed-head.

Involucral: Belonging to, or about, an involucre.

Involucre: A structure consisting of a number of prominent bracts that encircle the base of a flower, flower spikelet, flower cluster, spikelet cluster or fruit.

Keeled: Having a prominent ridge running lengthwise; keel-shaped.

Lanceolate: Lance-shaped, narrow and tapering to a point at the apex.

Leaflet: Part of a larger compound leaf that itself resembles a small leaf.

Linear: Long and narrow.

Lobed: Having deeply indented margins and forming sections that are not completely separated from one another.

Monocot: Having one seed leaf.

Node: The joint on a stem from which other structures such as leaves arise.

Nut: A one-seeded and hard-shelled fruit that does not open at maturity.

Nutlet: A very small nut.

Oblanceolate: Lance-shaped (lanceolate), but with the pointed end at the base.

Obovate: Egg-shaped in outline (ovate), but with the narrower end at the base.

Oppositely arranged: Arranged in pairs and arising from the same level along a plant stem.

Ovary: The female part of a flower which contains the immature seeds (ovules) and later becomes the fruit.

Ovate: Egg-shaped and flat; broader and rounded at the base and tapering toward the end.

Ovoid: Egg-shaped and solid or three-dimensional.

Palmate: A compound leaf divided into leaflets that radiate from one point and resemble the fingers of a hand; the arrangement of lobes, segments or veins on a leaf where they radiate from one point like the fingers on the palm of a hand.

Panicle: An inflorescence or flower cluster that is divided into branches, each bearing several flowers.

Pappus: A ring of hairs, bristles, or scales found at the top of many fruit belonging to the Sunflower Family (Asteraceae).

Pedicel: The stalk of each flower that is part of a larger inflorescence or flower cluster.

Petiole: A leaf stalk; a stalk attaching the leaf blade to the stem.

Pilose: With a scattered covering of long soft hairs.

Pinna: One of the branchlets of a twice-compound (bipinnate) leaf on which the leaflets are borne; one of the leaflets of a once-compound (pinnate) leaf.

Pinnate: A once-compound leaf having several leaflets arranged on each side of a stem or rachis.

Pinnatifid leaf: A simple leaf with its blade cut into lobes reaching about halfway to the midrib so that it partially resembles a pinnate leaf.

Pistil: The female organs of a flower, usually consisting of an ovary, style(s) and stigma(s).

Pubescent: Covered with short, fine hairs; hairy.

Prostrate: Growing or lying flat along the ground.

Raceme: An unbranched inflorescence with several flowers, each flower having a stalk or pedicel.

Rhizomatous: Consisting of or having the appearance of rhizomes.

Rhizome: A horizontal, root-like stem usually found underground and often with short internodes.

Rhomboid: Diamond-shaped; shaped like a rhombus.

Rosette: A circular arrangement of leaves that radiate from a central point close to the ground.

Sagittate: Arrow-head shaped; triangular with the two sharp, downwards-pointing, lobes at the base.

Scabrous: Having a rough surface texture.

Scale: A much-reduced leaf or a small leaf-like structure; a small, thin, and often disc-shaped structure (e.g. a specialized leaf or bract) that protects a flower bud or is present on a fruit.

Schizocarp: A dry indehiscent fruit that splits into one-seeded segments (mericarps) at maturity.

Serrulate: Having a minutely serrate margin; finely, but sharply, toothed.

Sessile: Stalkless; without a stalk and attached directly at the base.

Sheath: An almost tubular structure such as the base of a leaf that surrounds or clasps the stem.

Spadix: A type of flower spike (inflorescence) consisting of small flowers crowded on a thickened stem (common in the Arum Family [Araceae] and is usually subtended by a spathe).

Spathe: A large and often colorful bract that subtends, and often partially encloses, a flower cluster.

Spike: An unbranched inflorescence with stalkless (sessile) flowers arranged directly on the stem.

Spikelet: A unit of the inflorescence in the grasses and sedges having one to many reduced flowers (florets); a small flower spike.

Stamen: A male reproductive organ of a flower consisting of a pollen-bearing anther and its stalk (filament).

Stellate: Star-shaped; having several pointed projections radiating from a central point.

Stigma: The part of a female flower which is receptive to pollen, and is usually located at the top of a style.

Stipule: A small and usually leafy structure or appendage at the base of a leaf that is usually one of a pair.

Stolon: A creeping or trailing stem that grows above ground and roots at the nodes; a runner.

Stoloniferous: Having or producing stolons.

Style: The usually elongated and slender female part of a flower connecting the ovary to the stigma.

Tendrils: A slender, usually twisting, structure found on the stems or leaves of some plants that aids climbing by clinging to objects and thereby providing support.

Trifoliate: Describing a compound leaf with three leaflets.

Variiegated: Having different colored markings (e.g. spots, blotches, streaks or patches).

Basic Plant Botany and Diagrams

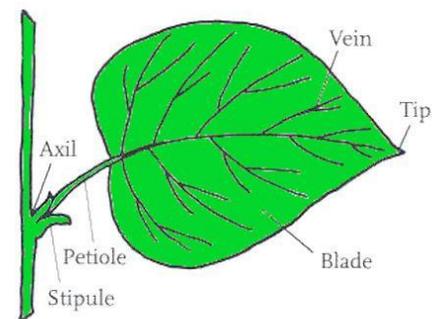
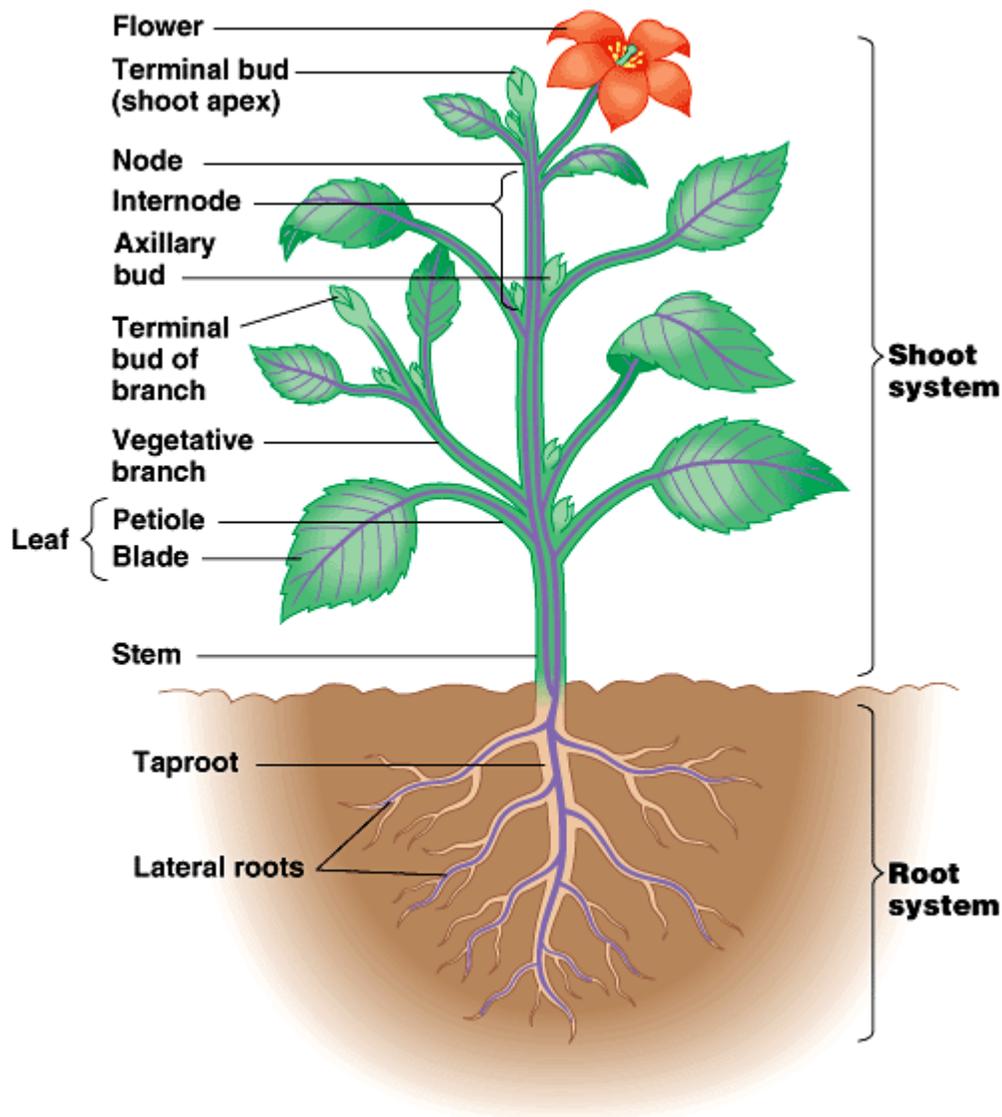


Figure 2. Leaf parts.

Figure 1. Principal parts of a vascular plant.

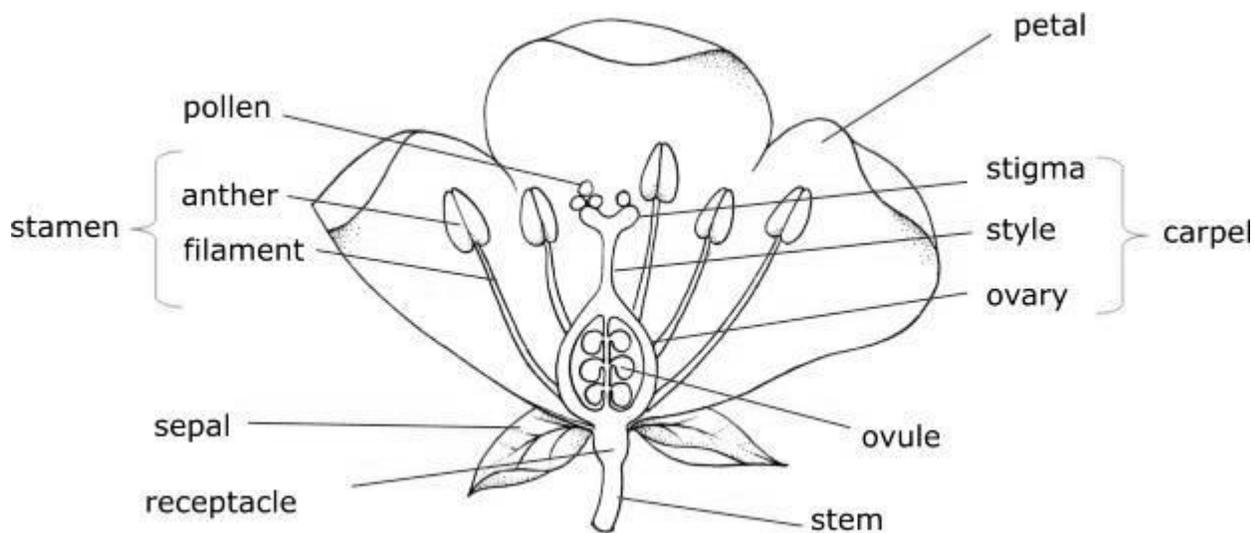


Figure 3. Flower structure.

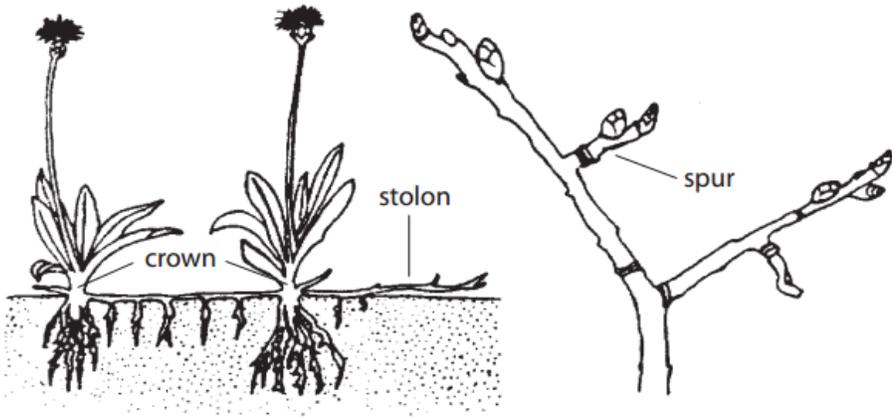


Figure 4. Diversified aboveground stem development.

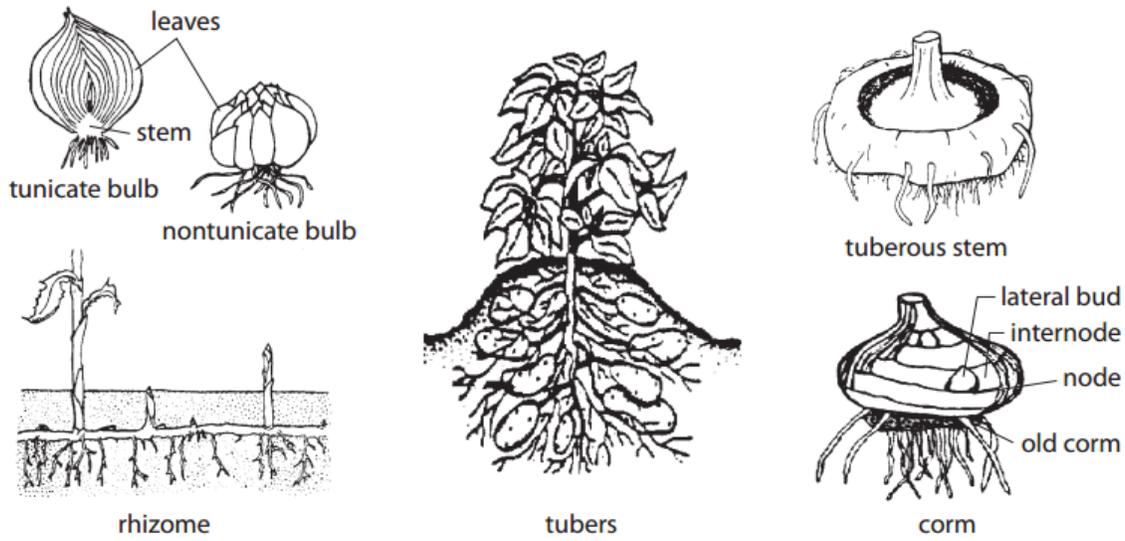


Figure 5. Diversified belowground stem development.

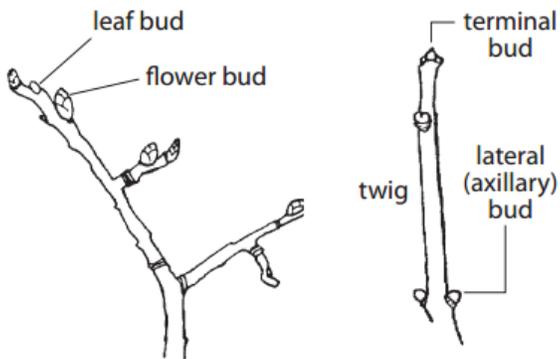


Figure 6. Types of buds and bud locations.

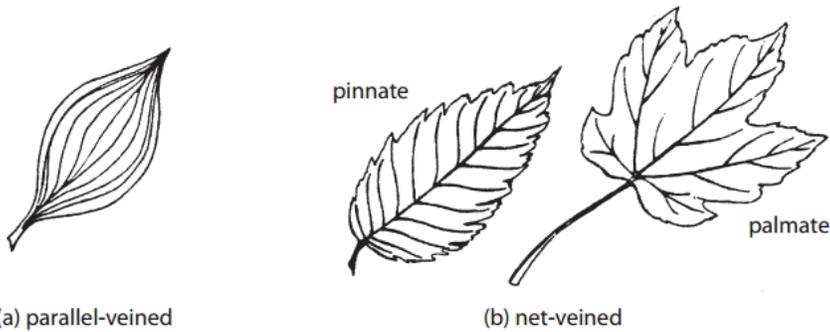
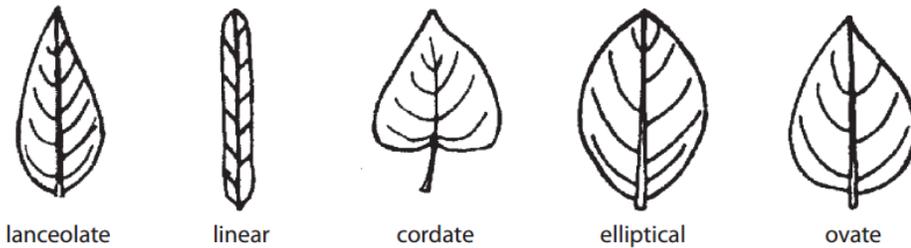


Figure 7. Types of venation: (a) parallel-veined; (b) net-veined.



Lanceolate—Longer than wide and tapering toward the apex and base.

Linear—Narrow, several times longer than wide and of approximately the same width throughout.

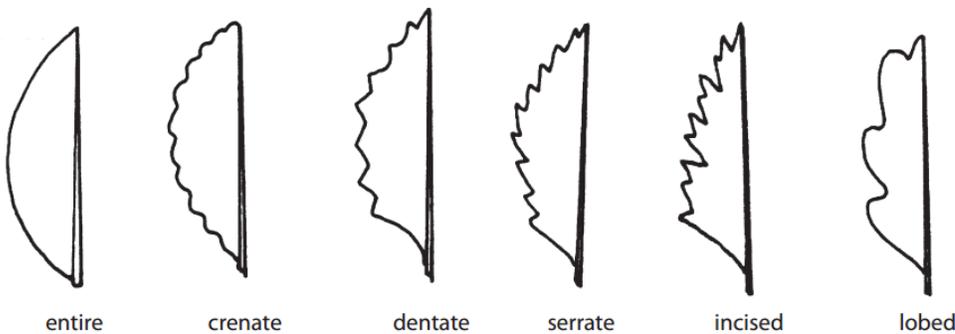
Cordate (heart-shaped)—Broadly ovate, tapering to an acute apex, with the base turning in and forming

a notch where the petiole is attached.

Elliptical—About two or three times as long as wide, tapering to an acute or rounded apex and base.

Ovate—Egg-shaped, basal portion wide, tapering toward the apex.

Figure 8. Common leaf blade shapes.



Entire—Having a smooth edge with no teeth or notches.

Crenate—Having rounded teeth.

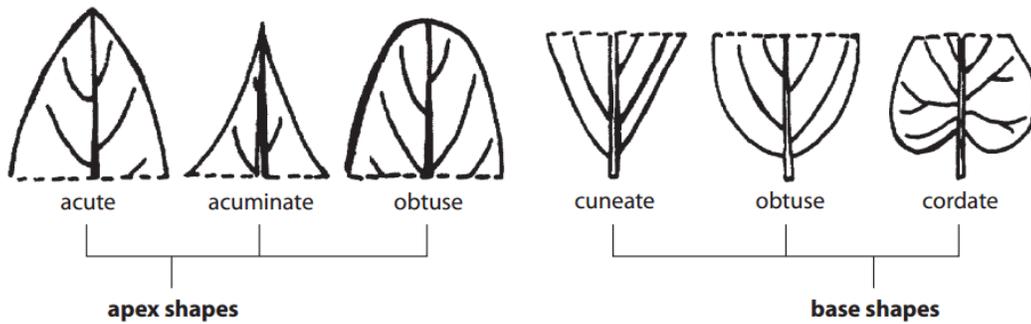
Dentate—Having teeth ending in an acute angle pointing outward.

Serrate—Having small, sharp teeth pointing toward the apex.

Incised—Having a margin cut into sharp, deep, irregular teeth or incisions.

Lobed—Having incisions that extend less than halfway to the midrib.

Figure 9. Common leaf margin shapes.



Acute—Ending in an acute angle, with a sharp, but not acuminate, point.

Acuminate—Tapering to a long, narrow point.

Obtuse—Tapering to a rounded edge.

Cuneate—Wedge-shaped; triangular with the narrow end at the point of attachment.

Cordate (heart-shaped)—Turning in and forming a notch.

Figure 10. Common leaf apex and base shapes.

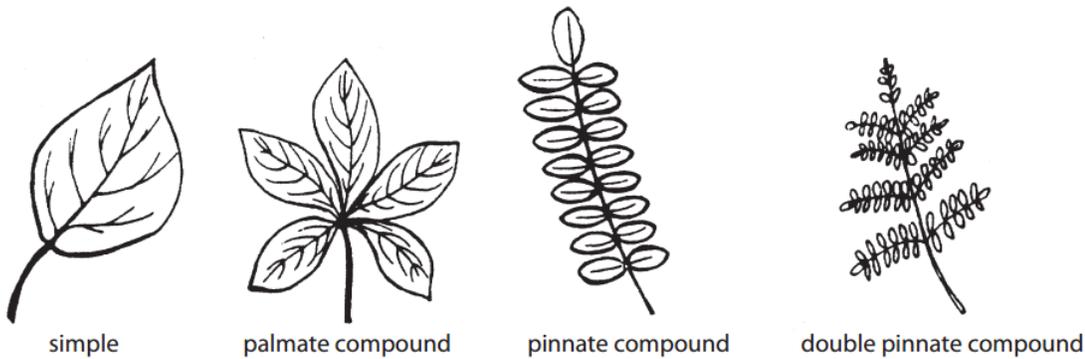


Figure 11. Leaf types.

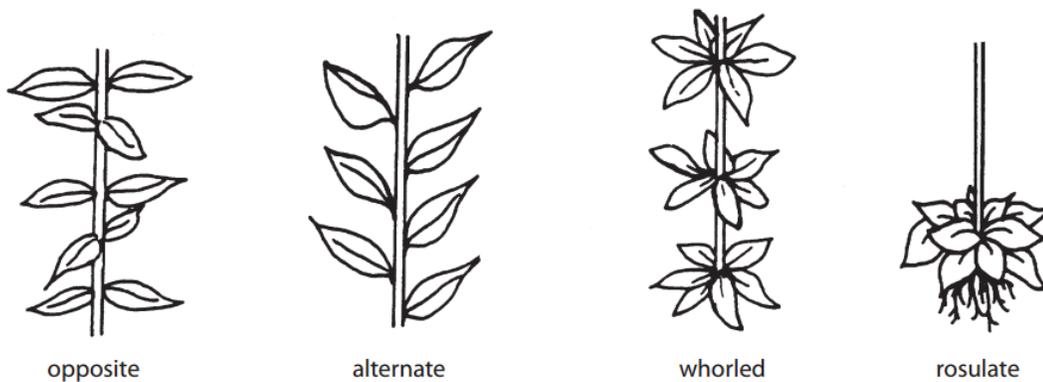
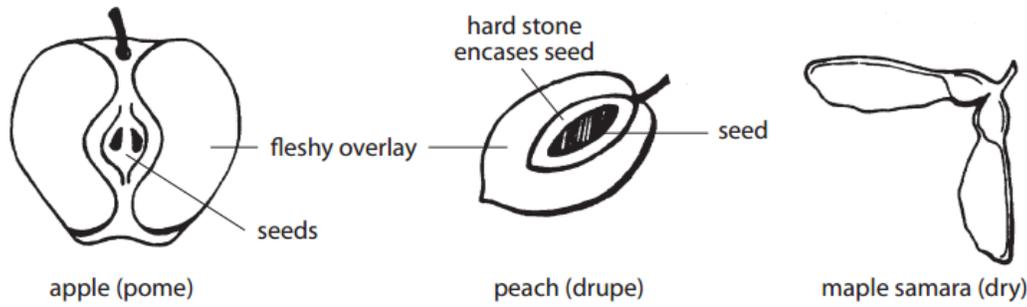


Figure 12. Leaf arrangement.

(a) simple fruits



(b) aggregate fruits

(c) multiple fruit

Figure 12. Types of fruit: (a) simple fruits (apple, peach, and maple); (b) aggregate fruits (berry and cone); (c) multiple fruit (pineapple).

Diagrams from *Basic Botany Kentucky Master Gardener Manual*: Chapter 1, by Ann Marie VanDerZanden (former extension master gardener state coordinator, Oregon State University), adapted for Kentucky by Richard Durham (extension consumer horticulture specialist and master gardener state coordinator, University of Kentucky).

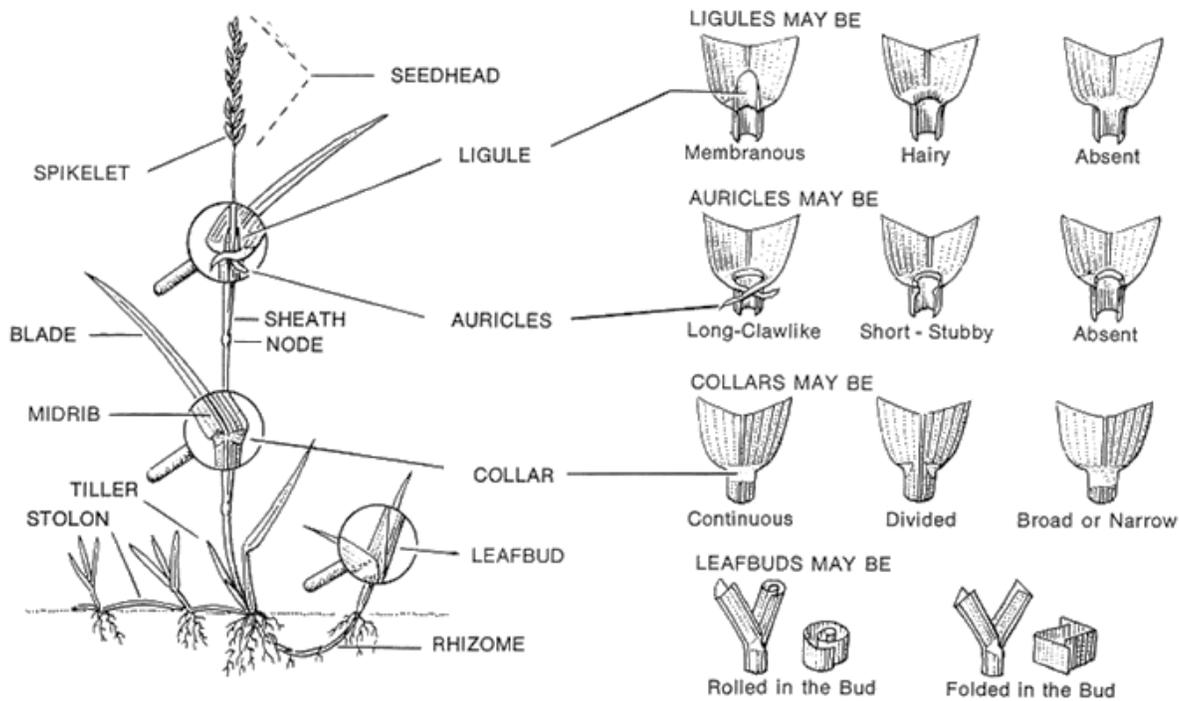


Figure 13. Parts of a grass plant.

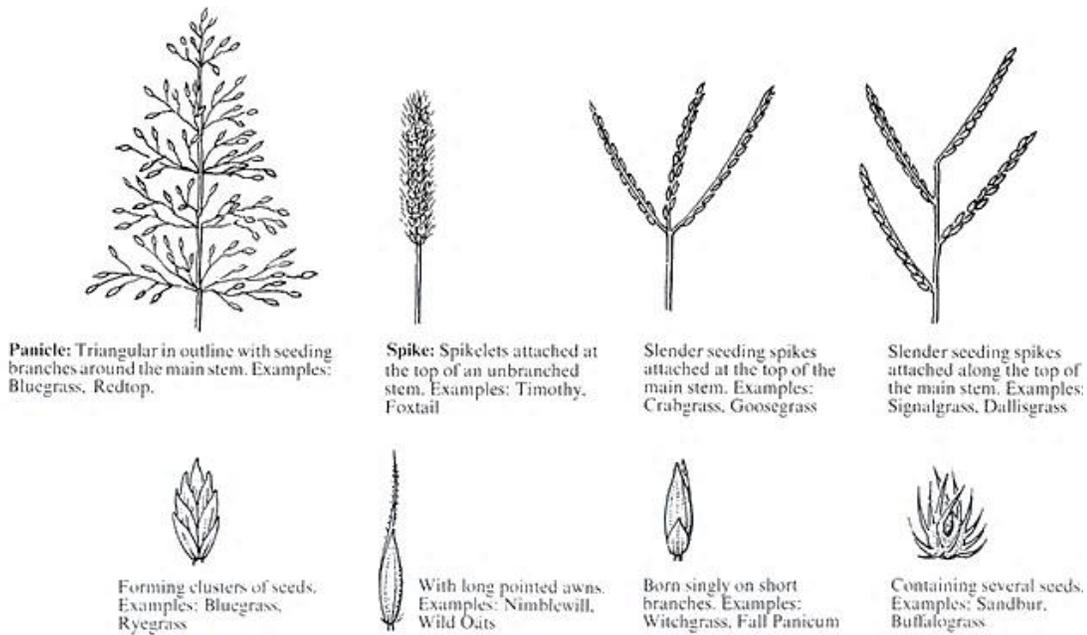


Figure 14. Examples of grass seedheads and spikelets.

Codes, Symbols, and Definitions

Species Accounts

At the top of each species account, the species name and the corresponding 6-letter code is provided along with the species' status and approximate height (coarse scale). For example:

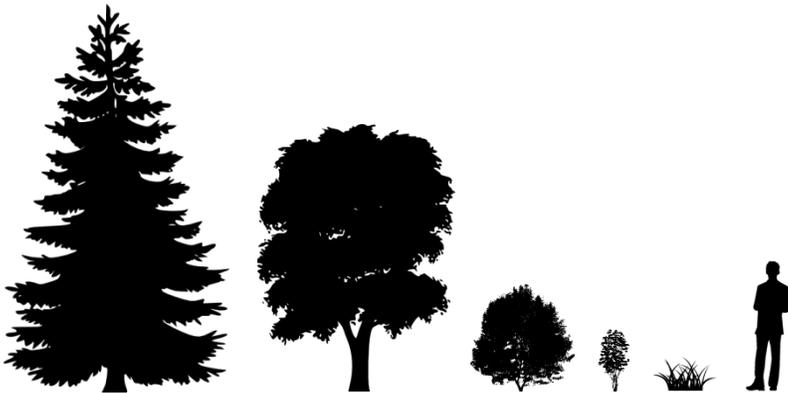
Cyndodon dactylon = Latin name

(Bermuda Grass) = Common name

CYNDAC = 6-letter code (often used in propagation/outplanting)

Native, Non-native, Invasive weed = Status

Nearly eradicated, watch list, potential reintroduction = Sub-status



Coarse scale comparison

Status and Sub-status Definitions

Native: A species that, other than as a result of an introduction, historically occurs/occurred on Midway Atoll NWR, the Northwestern Hawaiian Islands (NWHI), and/or Hawai'i.

Non-native: A species that is not native to Midway Atoll NWR, the NWHI, or Hawai'i; other terms sometimes used for non-native species include "exotic," "non-indigenous," and "alien."

Invasive weed: A non-native species that causes or is likely to cause environmental or economic harm or harm to human health.

Nearly eradicated: A non-native or invasive weed species that 1) has been or was controlled, 2) is still relatively widespread or locally abundant, and 3) could possibly be eradicated. For these species, sometimes a limited quantity of individuals remain; other species may have a persistent seed bank that will likely require continued monitoring and control efforts.

Watch list: A non-native or invasive weed species that is currently tolerated or not controlled on Midway Atoll NWR because it is edible, aesthetic, historical, provides wildlife habitat, or does not exhibit signs of spreading. Many of these species will likely never spread far but others have the potential to spread beyond their current distribution. Continued monitoring of these species will allow for the greatest number of potential control options should control be deemed necessary.

Potential reintroduction: A native species that became extirpated in the past but is a candidate for reintroduction or is in the process of reintroduction at Midway Atoll NWR.

Grasses and Sedges



Cyperus polystachyos

Grass Family (Poaceae)



Sporobolus virginicus

Andropogon glomeratus (Yellow Bluestem/Bushy Beardgrass)

ANDGLO

Invasive weed



Key Characteristics:

- Warm-season, herbaceous, perennial bunchgrass that grows 2-4 ft (0.5-1.2 m) tall, sometimes up to 6 ft (2 m); grows in rather small clumps.
- Flattened sheaths are overlapping and with a few scattered hairs; upper part of the plant is rounded and the lower part is slightly flattened and keeled; leaves are flat to partly folded, 10-15 in (25-40 cm) long, and approximately 0.1 in (0.3 cm) wide; rest of plant is a pale greenish yellow.
- Distinguishing characteristics: thick, massive, reddish brown, terminal inflorescence composed of paired silky racemes (flower clusters with the separate flowers attached by short equal stalks at equal distances along a central stem) and flattened blue green foliage; produces many fluffy seeds on the upper half of the plant that are distributed by the wind.

General Information:

- Prolific producer of small seeds that disperse by wind and readily establish on exposed soil.
- Mainly confined to the Airport Extension (Sector 38) and in a small area along the edge of the Airport ramp corner (Sector 5). Since the 2011 storms, it has spread along the abandoned runway by Rusty Bucket and across a large patch of the Airport Extension as well as Sector 43. It has also appeared at Radar Hill (east Sector 16) and Turtle Beach (Sector 30). Primarily contained near Catchment Seep (Sector 5), around water tanks, and near active runway of Henderson Airfield.

Bromus catharticus (Prairie Grass/Rescue Grass)

BROCAT

Invasive weed



Key Characteristics:

- Annual or perennial, tufted grass that can grow up to 3 ft (1 m) tall; however, this grass is more commonly seen as growing near the ground, radiating from a central point.
- Large openly branched seed-heads have a nodding appearance; seed-heads are made up of numerous large, flattened flower spikelets.
- Easily confused with *Eleusine indica* (Goose Grass) when not blooming or seeding.

General Information:

- Uncommon invasive weed at Midway Atoll NWR, mainly occurring in lawns around Midway House and other residences, near the Gym, and in the field across from Charlie Barracks. Also found on the corner of the field in Sector 23, bordering Sectors 24 and 25.
- If unchecked, forms dense swards that outcompete native grasses and ground layer plants and prevents natural regeneration.
- This grass has largely been eliminated from Sand Island and has not been found on Eastern or Spit Island: report if observed.

Cenchrus ciliaris (Buffel Grass)

CENCIL

Invasive weed: nearly eradicated



Key Characteristics:

- Extremely variable species, tufted (sometimes shortly rhizomatous) perennial, often forming thick mats or tussocks with dense, usually stoloniferous root systems; erect and branching culms range from 4-60 in (10-150 cm) tall.
- Leaf blades linear, 0.1-0.5 in (0.2-1.3 cm) wide and 1.2-11.8 in (3-30 cm) long; green, blue-green to gray-green in color, scabrous (rough texture), mostly glabrous (hairless), sometimes hairy at the base and on the upper surface of the blade.
- Inflorescence is generally cylindrical in outline, 0.8-5.5 in (2-14 cm) long, and can be purple, gray, or yellow in color; inflorescence is erect or nodding, straw, grey or purple colored, bristly, with a false spike 0.8-6 in (2-15 cm) long and 0.4-1 in (1-2.5 cm) wide, with seed units or fascicles (bundles of seeds) inserted along a zig-zag axis.

General Information:

- *C. ciliaris* is an invasive weed species throughout the Hawai'i, often the dominant grass in dry lowland areas.
- At Midway Atoll NWR, this species is limited to a few isolated clumps near Cargo Pier and Turtle Beach. Interestingly enough, Red-tailed Tropicbirds (*Phaethon rubricauda*) are able to burrow and nest in the base of this grass plant when it grows in lone clumps; solid patches of this grass seemed to exclude seabirds.

Cynodon dactylon (Bermuda Grass)

CYNDAC

Non-native



Key Characteristics:

- Introduced, perennial, low-growing, mat-forming, warm season grass; both rhizomatous and stoloniferous.
- Stems slightly flattened, often tinged purple or red in color.
- According to the 2015 Botanical Survey of Midway Atoll NWR by Forest and Kim Starr, there appear to be two forms of this grass; a more diminutive form with smaller leaves that is more common, and a more robust form that is occasionally mixed in with the smaller form.
- Often confused with *Sporobolus virginicus* ('Aki 'Aki Grass).

General Information:

- Generally accepted in lawns, public areas, and monuments but has been removed from native outplanting areas.
- Currently tolerated as a beneficial plant cover and seems to help provide stability (when it occurs with other species rather than a monotypic stand) for Bonin Petrel (*Pterodroma hypoleuca*) burrows.
- Reproduces by seeds, but spreads most rapidly by stolons and rhizomes.
- Generally tolerant of low soil pH and high salt concentration.
- Early successional species; shade reduces *C. dactylon* vigor, and complete canopy closure may eliminate grass.
- Suspected of having allelopathic qualities that may make it undesirable in native plant areas.

Dactyloctenium aegyptium (Beach Wiregrass)

DACAEG

Invasive weed



Key Characteristics:

- Tufted, annual or short-lived perennial grass, up to 30 in (75 cm) high; multi-branched; stems are slender and erect; roots extend horizontally; leaves are broadly linear.
- The seed heads are quite characteristic, looking like a crow's foot.

General Information:

- Usually occurs in well-drained soils, especially on sandy soils and/or beaches.
- Serious roadside and beach spreader; range on Midway Atoll NWR greatly expanded after tsunami in 2011. This is an important target species for control and eradication: report if observed inland, away from beaches. It has been targeted in Sectors 17 and 26, especially at entrances to beaches. Specifically, it grows near Cargo Pier, and in an open area near the FWS Greenhouse where the SK1 Building was removed. Appears around every beach on Eastern Island and along every path and trail in the center of the island between Sectors 58 and 60. It is also on the north side of Spit Island.
- One of the most drought-resistant grasses; can quickly grow and seed during the wet season.
- Among the 20 most globally widespread weeds.

Eleusine indica (Goose Grass)

ELEIND

Non-native



Key Characteristics:

- Annual summer grass and occasionally, a perennial; forms a pale green mat-like clump with flattened stems that grows in a low rosette; stems are somewhat fleshy at the base; mature plant can spread to about 2.5 ft (80 cm) wide; leaf blades are nearly hairless, except for long hairs on the blade bases, collars, and/or upper sheath margins; leaves are keeled along the midvein near the base of the blade; sheaths are open, flattened, keeled, and are whitish at the base around the collar.
- Flowers cluster along stiff spikes and usually 2-6 spikes radiate out at the end of the flowering stem.

General Information:

- At Midway Atoll NWR, generally accepted as habitat but removed from lawn and roadsides. However, a large infestation has developed in the town area around residences. This grass is mostly targeted in the primarily disturbed sectors in town, and is seriously treated on Eastern and Spit Islands.
- Laysan Ducks (*Anas laysanensis*) have been observed consuming seeds from this plant; as such it is sometimes tolerated and may provide valuable habitat in some areas.
- Normally found in compacted areas or areas of heavy wear; it inhabits roadsides and trails, especially those that receive some summer water, and grows close to the ground.

Eragrostis amabilis (Love Grass/Tenella)

ERAAMA

Invasive weed



Key Characteristics:

- Small tufted, annual grass, with erect or ascendant culms, up to 2 ft (60 cm) tall; leaf sheath 1-2 in (2-4 cm) long, light purple, hairy at the mouth; leaf-blade narrowly linear with broad base and acute tip, often tinged purple.

General Information:

- At Midway Atoll NWR, common around old walls, roadsides, residences, in town, and along the runway. Specifically, this grass has been a problem along the north side of Sector 39 where it has broken in two fields; also common near old Sunrise Seep area (Sector 33). In addition, it has been persistent on the walkways leading up to Captain Brooks and up to the Clipper House in Sector 17.
- Seeds germinate at the beginning of the rainy season and grow quickly, thus producing grass early in the season.
- Flowers profusely throughout the year.

Eragrostis paupera (Dwarf Eragrostis)

ERAPAU

Native



Key Characteristics:

- The base of the plant is about the size of a quarter.
- *E. paupera* is the smallest of the native lovegrasses.

General Information:

- Very rare; only a small population may remain on Spit Island. *E. paupera* comes and goes on the most exposed cobble areas, with a high count of more than 40 plants observed in November 2013.
- Currently found in the Hawaiian Island Archipelago in the northwest portion of the chain at Kure Atoll, Midway Atoll, Pearl and Hermes Atoll, and French Frigate Shoals.

Eragrostis variabilis (Bunchgrass/'Emoloa/Kāwelu)

ERAVAR

Native



Key Characteristics:

- Variable, tufted, apparently short-lived perennial, large clumping grass; stems or culms are erect, smooth, and 1-3 ft (0.3-1 m) or more tall; considerable variation in length of leaves and flowering panicles; leaf blades are flat at the base and rolled inward at the upper part; leaves are 0.5-0.6 in (1.2-1.5 cm) wide and up to 32 in (80 cm) long.
- The flowering heads or panicles are narrow and range from 8-16 in (20-41 cm) long; they are either somewhat open or dense and spike-like, with branches strongly upright to spreading.

General Information:

- Endemic to Hawai'i; occurs on sand dunes, grasslands, open sites in dry forests, and exposed slopes and ridges or cliffs.
- Most common and successful native species on Midway Atoll NWR.
- Used for erosion control, dune stabilization, ecosystem restoration, and wildlife food and cover; also provides important nesting cover for the Laysan Duck (*Anas laysanensis*) and various other species, including Bonin Petrels (*Pterodroma hypoleuca*), Wedge-tailed Shearwaters (*Puffinus pacificus*), and Red-tailed Tropicbirds (*Phaethon rubricauda*).

Eustachys petraea (Finger Grass)

EUSPET

Invasive weed



Key Characteristics:

- Perennial, tufted, clumped grass; stems compressed (flattened); leaves mostly basal, below middle of stem; leaves sheathing at base, with sheath mostly open or loose; leaf sheath smooth; spikelets laterally compressed.

General Information:

- Appears to thrive in dry, high-traffic areas, such as roadsides and trails.
- At Midway Atoll NWR, this grass is extremely common near Catchment Seep area and found on abandoned runway as well on Sand Island. On Eastern Island, it is the dominant grass along much of the northern shore of the western tip of the island. It is a common understory plant of *Scaevola taccada* (Naupaka) in coastal environments such as Frigate Point and North Beach on Sand Island, along the northwestern coast on Eastern, and throughout the extensive *Scaevola taccada* (Naupaka) stands on Spit Island, where it was being controlled.
- Climbs over and shades out *Solanum nelsonii* (Pōpolo) on Spit and Sand Islands and is especially problematic on Spit Island.
- Easily confused with *Stenotaphrum secundatum* (St. Augustine Grass) when not blooming.

Lepturus repens (Lepturus)

LEPREP

Native



Key Characteristics:

- Highly variable in form; freely branching, creeping grass with stems as long as 20 in (50 cm) that easily root at the nodes; leaves are slender and linear up to 8 in (20 cm) long.
- Apparently an annual grass; becomes more abundant during the winter months.

General Information:

- Grows on rocky and sandy shores of both atolls and high islands in the tropical Pacific region, frequently in sand just above the high tide mark.
- At Midway Atoll NWR, primarily grows in the northwest and southwest beaches on Eastern Island and some beaches on Spit Island. Also beginning to appear on West Beach on Sand Island.

Polypogon monspeliensis (Annual Rabbitsfoot Grass)

POLMON

Invasive weed



Key Characteristics:

- Tufted perennial, sometimes flowering the first year, stems less than 1 m tall, erect, often bent at the base; leaves alternate; blades linear, flat, and thin.
- Soft, fluffy inflorescence is a dense, greenish, plume-like panicle, sometimes divided into lobes; spikelets have long, thin, whitish awns, which give the inflorescence its soft texture.

General Information:

- Found in moist sites along wetlands, ditches, waste areas, and disturbed or abandoned areas.
- Most commonly seen along the road on the eastern Airport Extension and at seeps. Originally seen around the Radar Hill Seeps and still occurs there but has also spread to the Ballfield Seeps. It has spread along the roadside heading to and from the Dump through the middle of Sector 38 (Runway Extension), and is spreading into the Brackish Seep area. Also appears in other areas around town as well as the Old Fuel Farm.

Setaria verticillata (Bristly Foxtail)

SETVER

Invasive weed



Key Characteristics:

- Loosely tufted, annual grass; culms reach 4-40 in (10-100 cm); leaf blades are up to 10 in (25 cm) long and have a long sheath around the stem; leaf blades broadly linear, 2-12 in (5-30 cm) long, 0.2-0.6 in (4-16 mm) wide; sheaths glabrous (hairless) to pubescent (hairy).
- Contains many small spikelets and bristles; bristles have tiny backwards-pointing barbs that help them hook onto clothing or animal fur, facilitating their dispersal.

General Information:

- Adapted to a wide range of habitats enabling widespread infestation in temperate, disturbed areas throughout the world.
- Exhibits phenotypic plasticity; quite resilient to herbicides, mechanical damage, and drought.
- Invasive nature has resulted in significant displacement of native grasses.
- At Midway Atoll NWR, largest concentration has been near Rolando Seep and Rolando Guzzler (Sector 58). Small infestations are being controlled in the residence area, especially around the Midway House (Sector 20). Appears in grassy areas, specifically in town.

Sporobolus indicus (Smut Grass/India Dropseed)

SPOIND

Invasive weed



Key Characteristics:

- Perennial, tufted grass reaching around 3 ft (1 m) in height; stems are round in cross-section, very tough and wiry, branched, fibrous at the base, and grow in a spreading to erect manner; leaves are flat, rolled in the bud, have conspicuous veins, are hairless except for a few tiny hairs around the collar, and grow from 3-12 in (8-30 cm) long and 0.1-0.2 in (3-5 mm) wide; sheaths are open and have intact or frayed, brown bases; sheaths are hairless, while margins are hairy toward the apex.
- Single flowers form clusters called inflorescences in dense spike-like or raceme-like branches (panicles) that range from 4-20 in (10-50 cm), but can grow to 31 in (80 cm); often gray-green or purplish in color.

General Information:

- Can often be distinguished by presence of a black fungus called "smut" which infects the flower clusters and upper leaves; hence the name "Smut Grass."
- Tolerates nutrient poor, compacted soils.
- Storm events may disperse seed, either by water or wind.
- This plant has spread rapidly since the removal of *Verbesina encelioides* (Verbesina/Golden Crown-Beard). Large infestations in Sectors 24 and 25 near the Old Fuel Farm, behind the Power Plant (Sector 37), and in the Catchment Seep area (Sector 50). It has existed for several years near the Sewer Pumphouse in Sector 8. On Eastern Island, it has spread to the rocky area near the south beach in Sectors 57 and 58. Also seen in Sectors 55, 60, 58, and various Laysan Duck seeps, specifically Sunset Seep.

Sporobolus pyramidatus (Sporobolus)

SPOPYR

Invasive weed



Key Characteristics:

- Perennial; leaves mostly basal; leaf-sheaths glabrous on surface and outer margin hairy.
- Usually small, rarely more than 4 in (10 cm) across.

General Information:

- At Midway Atoll NWR, serious breakout after tsunami in 2011. Spreading in the Airport Extension (Sector 38) and recently found in the area adjacent to the Air Facility in Sector 42; also along the Short-tailed Albatross plot on Eastern Island. In addition, movement to and from seeps seems to be spreading this grass.
- Has also spread on the Runway in Sector 57 and through parts of Sectors 55 and 60; has the potential for spreading and has been seen at the seeps on Eastern Island.
- This grass is becoming an occasional to common species in hard-packed areas, especially abandoned runways.

Sporobolus virginicus ('Aki'aki Grass/Beach Dropseed)

SPOVIR

Native



Key Characteristics:

- Low-growing, perennial grass that spreads by rhizomes; height ranges from 4-8 in (10-20 cm) tall; leaves are 1-4 in (2-4 cm) long and 0.04-0.12 in (0.1-0.3 cm) wide; leaf sheath is overlapping and hairy at the throat.
- Flowers are green to purple in color.
- Size of grass varies greatly because of the spreading nature via rhizomes, but clump may range anywhere from 2-10 ft (0.6-3 m) or more.

General Information:

- Some authorities recognize two forms of this grass, a smaller type with leaves usually less than 2 in (5 cm) long and a more robust type with leaves up to 6 in (15 cm) long. The more robust type also has larger rhizomes (underground stems) and seed heads and is more common on beaches and dunes. It is thought that the smaller form of this grass occurs on Midway Atoll NWR.
- Although this grass does produce seed, very little of it is viable; the only practical way to propagate it is by vegetative rhizomatous slips.
- This grass has been reintroduced in a few locations on Sand and Eastern Islands, where vigorous populations have been difficult to establish; plants are usually lanky and wispy-looking. There is also a small demonstration population nearby the Clipper House, USFWS Office, Cable Company Building, and Old Marine Barracks.

Stenotaphrum secundatum (St. Augustine Grass)

STESEC

Non-native



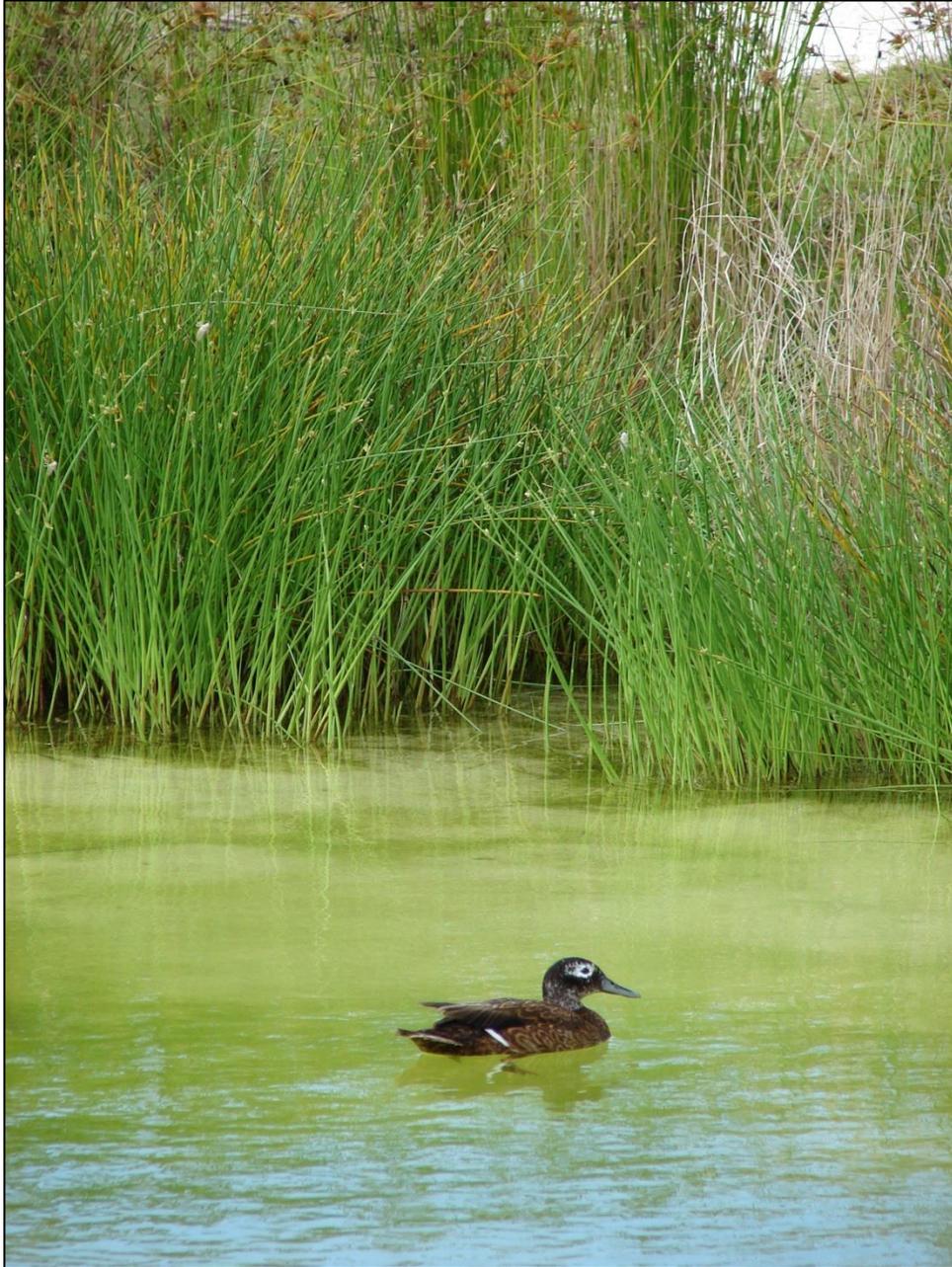
Key Characteristics:

- Dark green grass with broad, flat blades.
- Hardy perennial, creeping extensively by means of branched rhizomes and many-noded stolons; variable in size, culms rising above the ground for 2-16 in (6-40 cm) or more, branching from numerous nodes, producing flowering stems or fin-shaped tufts of leaves.

General Information:

- Tolerated and preferred in some areas because it competes with other invasive species, does not seem to spread, and is beneficial for some wildlife.
- Spreads by aboveground stolons, commonly known as "runners," and forms a dense layer.
- Occurs in both wetlands and non-wetlands; can also be found along roadsides and trails and is tolerant of short dry periods.
- Locally dominant in parts of Sand Island including the residences near the Midway House, the USFWS Office, Parade Field, and West Beach.
- Seems to prefer growing in semi-shade, often found near *Casuarina equisetifolia* (Ironwood) or where these trees have been removed.

Sedge Family (Cyperaceae)



Cyperus laevigatus

Cyperus involucratus (Umbrella Plant)

CYPINV

Invasive weed: nearly eradicated



Key Characteristics:

- Herbaceous, perennial sedge; grows in clumps in wet and boggy areas, although it will thrive in drier situations as well.
- Clumps are composed of upright, slender, triangular stems that arise from a network of woody rhizomes and grow to a height of 2-6 ft (0.6-1.8 m); stems are green, mottled, and striped with white; variegated foliage sometimes reverts to green over time; small basal leaves are barely noticeable as they are reduced to sheaths around the bottom of the stems; stem tips are about two dozen leaf-like bracts that are 6-15 in (15.2-38.1 cm) long, about 0.5 in (1.3 cm) wide and radially arranged like the spokes of wheel.
- Clusters of small greenish flowers grow from the center of the disk; flowers are followed by small fruits that mature to dark brown.

General Information:

- Tolerant of and prefers damp to wet soil.
- Wetland and seep invasive. Large patches currently in back of Doctors Cemetery, the central east area of Sector 9, old Sunrise Seep area and Ballfield Seeps. Otherwise, this sedge is nearly eradicated on Midway Atoll NWR.

Cyperus laevigatus (Makaloa Sedge)

CYPLAE

Native



Key Characteristics:

- Rhizomatous, perennial marshy sedge, 1-3 ft (0.3-1 m) tall, with flattened stem; leaves half long as stem, linear, acute sheathing, and many-nerved at base.
- Inflorescence is a small array of cylindrical spikelets with one to three leaf-like bracts at the base; spikelets vary in color from green to reddish to dark brown.

General Information:

- Grows on mud flats, sandy coastal sites, and on edges of and in fresh, brackish, and salt water seeps/wetlands.
- Midway Atoll NWR's only native plant that requires wetland habitat to survive.
- Growing around seeps but periodically thinned to facilitate botulism checks; if left unchecked, this sedge can completely overrun a seep. Additionally, in some of the smaller seeps, most of the water surface can become displaced by *C. laevigatus*. As a result, this sedge and all other vegetation are sometimes removed from within and around all seeps.
- Prone to ants, scale, mealy bugs, and aphids.

Cyperus polystachyos (Pycreus Sedge)

CYPPOL

Native



Key Characteristics:

- Herbaceous, perennial sedge; stem is roughly triangular or round in cross-section; leaf blade is flat or rolled in at the edges.
- Young plants typically have long, slender, slightly curled or twirled blades.
- For mature plants, leaves to half of stem; sheaths are yellowish or gray-green in color, often with reddish tint; blades flat or folded, keeled, gray-green, margin narrowly recurved.
- The inflorescence is at the tip of the plant and is branched; inflorescence is initially greenish in color but turns golden brown over time.

General Information:

- Found growing in seasonally flooded/damp places, marshes, swamps, and at margins of pools.
- At Midway Atoll NWR, common in moist areas and is the most common species tolerated in such environments, specifically near seeps and the Airport Extension area.

Fimbristylis cymosa (Button Sedge/Mau'u 'aki'aki)

FIMCYM

Native



Key Characteristics:

- Small, dense sedge; appears in small, round clumps.
- Stems to 20 in (51 cm) tall, stiff; leaf blades basal, linear, to 0.25 in (0.6 cm) wide, spreading, stiff; bract stiff, shorter than inflorescence; inflorescence head-like, distinctive, densely crowded with spikelets; spikelets ovoid, to 0.25 in (0.6 cm) long, scales ovate; nutlet brown to black.
- Does *not* have the characteristic sharp-edged leaves many other sedges are known for; instead the leaves are short, stiff and pointed and thus well suited for harsh, coastal environments.

General Information:

- Common on sandy beaches and in shallow sand or silt on and among rocks and cracks in lava.
- At Midway Atoll NWR, this sedge does well in pavement cracks, primarily on old, abandoned runways. However, over time, this sedge has appeared to decline in abundance, mainly due to other vegetation germinating in the sedge clumps and then outcompeting the sedge. On Sand Island, Button Sedge is mainly found between the runways by Catchment Seep and the water tanks. On Eastern there are only a few clumps found on the abandoned runway on the northeast side. On Spit Island, *F. cymosa* once surrounded the ephemeral lake in the interior of the island; however, since the lake has disappeared, the *F. cymosa* population has decreased as well.

Forbs



Sida fallax

Amaranth Family (Amaranthaceae)



Amaranthus spinosus

Amaranthus spinosus (Spiny Pigweed)

AMASPI

Invasive weed: nearly eradicated



Key Characteristics:

- Erect, often bushy, much-branched summer annual, growing to heights of 2-5 ft (0.6-1.5 m); stems and leaves smooth and hairless, sometimes shiny in appearance; each leaf node along the stem bears a pair of rigid, sharp spines 0.5 in (2 cm) long; leaf blades are egg-shaped to diamond-shaped, with the broader end closest to the stem.
- Almost indistinguishable from *Amaranthus viridis* (Slender Amaranth) until spines appear; then *A. spinosus* grows taller.
- *A. spinosus* is only slightly more robust than *A. viridis* but is distinguished by axillary spines about 0.4 in (1 cm) long.

General Information:

- Occurs along roadsides and trails.
- At Midway Atoll NWR, found in the town area from the Orchard (Sector 37) to the Community Garden (Sector 19) and throughout the Senior Officer Housing (Sector 21) and an area behind the TV satellite dishes (Sector 20). Appears sometimes in other parts of Sand Island but is close to eradication.

Amaranthus viridis (Slender Amaranth)

AMAVIR

Invasive Weed



Key Characteristics:

- Annual herbaceous plant, growing to 1 ft (0.5 m); similar to other species of *Amaranthus*, having distinct leaf venation and long petioles.
- Stem erect or usually ascending; blades ovate to rhombic-oblong, base tapered to blunt, tip rounded; flowers green in color.

General Information:

- Co-exists with Spiny Pigweed (*Amaranthus spinosus*) because the two species have different nutritional requirements.
- At Midway Atoll NWR, found in the town area from the Orchard (Sector 37) to the Community Garden (Sector 19) and throughout the Senior Officer Housing (Sector 21) and an area behind the TV satellite dishes (Sector 20). Appears sometimes in other parts of Sand Island, such as around the USFWS Office and Ballfield Seep.

Arum Family (Araceae)



Epipremnum pinnatum

Epipremnum pinnatum (Golden Pothos/Taro Vine)

EPIPIN

Invasive weed: nearly eradicated



Key Characteristics:

- Herbaceous root-climber that can reach 20-26 ft (6-8 m) long; stems are flexible, cylindrical, green, and up to 1.2 in (3 cm) in diameter, producing watery sap; stems are tree climbing and often have aerial roots.
- Leaves are alternate, glabrous (hairless), and green, and paper-like in texture; juvenile leaves are simple, ascendant, heart-shaped, and variegated with yellow or cream; adult leaves hanging, pinnately dissected, up to 20 in (50 cm) long by 11.8 in (30 cm) wide, deeply pinnately lobed, and less variegated than juvenile leaves; petioles up to 13.7 in (35 cm) long.
- Inflorescence is axillary, solitary, erect; tiny flowers are in a cylindrical, cream-colored spadix (reproductive organ) above a cupped, oval, cream-colored, short-lived, petal-like spathe (a leaf-like bract that encloses or subtends a flower cluster); fruits are berries containing 1-2 seeds.

General Information:

- In the past at Midway Atoll NWR, *E. pinnatum* was found all around and climbing up the Cable Company building and nearby foliage. Since then, this species has been targeted for control efforts, but a few plants persist around town. *E. pinnatum* should continue to be monitored and controlled to prevent future damage to buildings and infrastructure.

Syngonium podophyllum (Arrowhead Plant)

SYNPOD

Invasive weed: nearly eradicated



Key Characteristics:

- Herbaceous, rampant creeper that grows over other vegetation, sometimes reaching lengths of 16-33 ft (5-10 m) or more.
- Younger stems are sometimes bluish-green in color and often contain a milky sap; stems are glabrous (hairless), smooth in texture, and slightly succulent; stems readily develop adventitious roots at their nodes; older stems turn pale brown and can become slightly woody; climbing stems develop aerial roots which adhere to the tree or structure that they are climbing on.
- Alternately arranged leaves vary in size, shape and color depending on their position on the plant; leaves are 6-24 in (15-60 cm) long that are grooved for part of their length as well as near their base (especially when the leaves are young); lower leaves are generally heart-shaped or more commonly arrowhead-shaped and have pointed tips; these leaves are 2.8-5.5 in (7-14 cm) long, dark green in color or with silvery-white veins or centers bounded by green; upper leaves are generally dark green and without any markings; these leaves are divided into 3 segments, or may eventually become even more divided and develop 5-11 separate leaflets, with the central one usually being broader and longer than the others.
- This plant has 4-11 flower spikes (spadices) which develop in leaf axils, each comprising 6-9 green tubular flowers, enclosed in a creamy-white to green modified leaf (a spathe); fruits are egg-shaped, red to reddish-orange in color, and contain many black or brown seeds within a soft, grayish pulp.

General Information:

- On Midway Atoll NWR, this vine is still cultivated and could climb up and damage plants and structures. Currently, this species is limited to a few of the residences and should be monitored and controlled, if necessary.

Xanthosoma robustum ('Ape)

XANROB

Invasive weed: nearly eradicated



Key Characteristics:

- Plants very large and conspicuous, with the caudex (the main stem or the basal stem structure from which new growth arises) usually prostrate, growing up to 3-13 ft (1-4 m) long.
- Petioles 15.7-71 in (40-180 cm) long or much longer; leaf blades sagittate-ovate (arrow-like) in shape, often 6.5 ft (2 m) long but usually shorter, with basal lobes half as long as the anterior one; blades are glabrous, grass green above, pale beneath.
- Tube of the spathe in 2.4-4 in (6-10 cm) long and 2.4 in (6 cm) broad, oblong-ovoid, greenish; limb is twice as long, ovate-lanceolate (lance-shaped), acute, greenish or whitish outside, white or pink within, 4.7-9.8 in (12-25 cm) long and 4-9.8 in (10-25 cm) wide; spadix is 0.3 in (8 mm) long, slightly shorter than the spathe.

General Information:

- In the past at Midway Atoll NWR, this species was found in the gardens around residences and by the Galley. Currently, this species is limited to one residence building; however, *X. robustum* is a very persistent plant. Avoid moving soil from areas where this plant is known from to other areas, as root fragments can regrow.

Asparagus Family (Asparagaceae)



Asparagus densiflorus

Asparagus densiflorus (Asparagus Fern)

ASPDEN

Invasive weed: nearly eradicated



Key Characteristics:

- Rounded herbaceous perennial with a fine-textured foliage, reaching 1-4 ft (0.3-1.2 m) tall, with stems stiff or spreading-arching to 6 ft (2 m).
- Leaves flat, scale-like, and inconspicuous, about 1 in (2.5 cm) long; structures that most refer to as leaves are actually leaf-like branchlets called cladophylls; these tiny cladophylls are linear, flattened structures that are bright green in color; cladophylls occur singly or in groups of 3 or more at a node; stems emerge directly from the ground and become woody and spiny (thorns can cause significant irritation).
- Tiny, white to pink, flowers occur in axillary racemes; the flowers are inconspicuous but fragrant; white-green (becoming red when mature), ovoid berries occur on this plant year-round, measuring less than 1 in (8 mm) in diameter.

General Information:

- On Midway Atoll NWR, this species is cultivated in residential areas. However, *S. densiflorus* has been known to escape from cultivation. As such, it would be appropriate to remove this species to avoid any potential dispersal.

Caper Family (Capparaceae)



Capparis sandwichiana

Capparis sandwichiana (Pus Pilo/Maiapilo/Caper Bush)

CAPSAN

Native: potential reintroduction



Key Characteristics:

- Perennial, low, sprawling shrub with stems growing 3-16 ft (1-5 m) long; fleshy, oval leaves are 1-2.5 in (2.5-6 cm) long and 0.75-2 in (2-5 cm) wide.
- Flowers are characteristically pea-shaped, measuring 2-4 in (5-10 cm) in diameter; flower consists of a mass of long white stamens surrounded by 4 petals; fragrant white flowers open after sunset and by morning they fade to a pale pink
- Fruit is an oval orange berry about 2-2.3 in (5-6 cm) long that resembles a green cucumber before ripening; small brown seeds are found in the smelly orange fruit pulp.

General Information:

- Assumed to be mostly extirpated from the NWHI, but still locally abundant in some parts of Hawai'i.
- Native habitat includes coral, basalt, or rocky soil along the coast or slightly inland on all of Hawai'i as well as the NWHI. The total number of plants remaining is still in the thousands; however, a decline in the total population of at least 10% has been estimated over the last ten years. Threats to *C. sandwichiana* include poor regeneration, grazing by goats, invasive alien plants, fire, urban sprawl and coastal development. *C. sandwichiana* is listed as a candidate for status as an endangered or threatened species by the USFWS; currently listed as "vulnerable" by the IUCN.
- In 2005, *C. sandwichiana* was reintroduced to Midway Atoll NWR from Laysan Island but did not survive. Currently, efforts are underway to propagate *C. sandwichiana* at Midway Atoll NWR.

Carpetweed Family (Aizoaceae)



Sesuvium portulacastrum

Sesuvium portulacastrum (Sea Purslane/'Ākulikuli)

SESPOR

Native



Key Characteristics:

- Perennial, herbaceous plant growing to 3-8 in (7-20 cm) in height; spreads and forms large patches much broader than tall; thick, smooth, reddish stems up to 3 ft (1 m) long.
- Small, smooth, glossy, green, succulent leaves range from 0.25-2 in (1-5 cm) long; generally leaves are medium green and turn red or yellow with age (those grown in open or full sun areas usually have redder leaves than do shaded plants); small purple, pinkish, or white flowers.

General Information:

- Groundcover in open, coastal areas; one of the most salt-tolerant of all coastal plants.
- Pioneer species: naturally grows on sunny, windy, sandy beaches and coastal coralline areas and other areas with unconsolidated substrate in direct salt wind and spray.
- An important sand stabilizer of beach dunes and can tolerate occasional flooding by sea water.
- On Eastern Island, present on the western tip of the island, from the high tide line to about where most other vegetation began. Forest and Kim Starr note that several birds utilize *S. portulacastrum* to sit on, as it is softer than the sand cobble. On Spit Island, *S. portulacastrum* grows and thrives in a moist depression and sandy berm of the eastern end of the island. Forest and Kim Starr also note that *S. portulacastrum* is sparingly utilized by Red-Footed Boobies (*Sula sula*) as nesting material on Spit Island. On Sand Island, *S. portulacastrum* thrives at Bulky Dump, apparently maintaining a competitive advantage in the salt spray zone.

Creosote Bush Family (Zygophyllaceae)

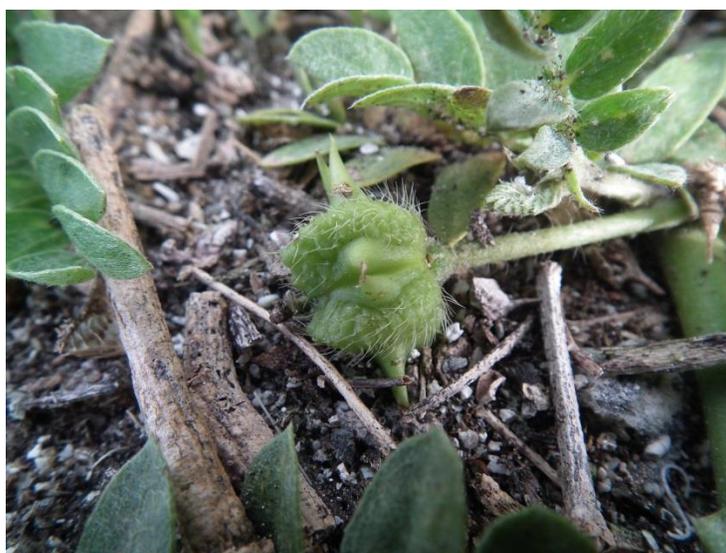


Tribulus cistoides

Tribulus cistoides (Tribulus/Nohu/Caltrop)

TRICIS

Native



Key Characteristics:

- Perennial, prostrate plant, coarsely haired, low-growing, forming mats 2-15 ft (0.6-5 m) in diameter; stems are covered with upright to flattened hairs, becoming hairless with age; leaves are opposite, compound (divided into leaflets), pinnately compound, 6 in (15 cm) long leaves; these are divided into 6 to 8 pairs of elliptic leaflets ranging from 0.25-0.5 in (0.5-1.25 cm) long.
- Solitary, bright yellow, 1.5 in (4 cm) wide, 5-petaled flowers are produced; spiny fruit 0.5 in (1.25 cm) wide are produced after flowering.

General Information:

- Occurs as the dominant ground cover species on Eastern Island once *Brassica nigra* (Black Mustard) and *Verbesina encelioides* (Verbesina/Golden Crown-Beard) were removed.
- Red-footed Boobies (*Sula sula*) use *T. cistoides* as nesting material on both Eastern and Spit Islands.
- Dried, spiky seeds ("caltrops") commonly puncture shoes and birds' feet.
- Vine-like growth habit allows it to colonize and break up abandoned runways and asphalt.
- Seeds are very persistent in the environment; able to remain dormant in the soil for up to 5 years.

Evening Primrose Family (Onagraceae)



Oenothera laciniata

Oenothera laciniata (Evening Primrose)

OENLAC

Invasive weed



Key Characteristics:

- Annual or short-lived perennial herb grows 4-18 in (10-45 cm) high, producing a spreading stem from a hairy rosette of deeply cut or lobed leaves; leaves are alternate, simple, pinnately cleft into rounded lobes, or sometimes merely wavy-edged or toothed; usually leaves are about 2 in (5 cm) long and 0.5 in (1 cm) wide; stems are light green, and more or less hairy.
- Flowers occur in the axils of leaves higher on the stem; each flower has pale to deep yellow petals up to about 1 in (2.5 cm) long which fade orange, pink, or red with age.
- Often sprawls across the ground, or it is weakly ascending (particularly near the tips of its branches).

General Information:

- Usually found in sandy habitats, although occasionally found in barren gravelly areas.
- Currently, this plant is targeted for spraying on Midway Atoll NWR near SK1 Warehouse restoration site; also common near the Old Fuel Farm, Cargo Pier, Turtle Beach, NAF Hangar, and abandoned runways.
- Flowers bloom at night and become closed during the morning; only a few flowers bloom at the same time.

Four O'Clock Family (Nyctaginaceae)



Boerhavia repens

Boerhavia repens (Alena)

BOEREP

Native



Key Characteristics:

- Annual to perennial, prostrate or straggling, herbaceous plant, often mat-forming; stems up to 2 ft (0.6 m) long; stem few- to much-branched, fleshy, green, often flushed with red; leaves opposite, simple, unequal; blade broadly ovate to elliptical, base cuneate, rounded or truncate; flowers usually in clusters of 2-6, white, pink, or mauve.

General Information:

- Found flowering and fruiting throughout the year, when sufficient water is available.
- Woody base helps break up old pavement; commonly found growing in cracks on abandoned runways, at the edge of *Casuarina* spp. forest, and around Eastern Island. However, Forest and Kim Starr note a general decline in the abundance of this species, perhaps due to non-target effects of regular herbicide control work.
- Forest and Kim Starr also note distorted growth on *B. repens* that emitted a white dust into the air when disturbed. Closer inspection revealed what is likely a rust, perhaps a White Rust (*Albuginaceae*). This species of rust has most likely been present on Midway Atoll NWR for a longer period of time; *B. repens* is able to reproduce despite the rust.

Mirabilis jalapa (Trumpet Plant/Four O'Clock)

MIRJAL

Invasive weed: nearly eradicated



Key Characteristics:

- Bushy, tender perennial that typically grows to 2-3 ft (0.5-1 m) (less frequently to 4 ft [1.2 m]) tall on erect, branching stems; features fragrant, funnel-shaped, tubular flowers (2 in [5 cm] long) with five flaring petal-like lobes; flowers come in pink, rose, red, magenta, yellow and white, sometimes with interesting mottling and striping.

General Information:

- Flowers with different colors can be found simultaneously on the same plant; additionally, an individual flower can be splashed with different colors. At Midway Atoll NWR, most *M. jalapa* flowers are pink.
- Flowers open in the late afternoon (around four o'clock) and stay open only until the following morning.
- Nearly eradicated: report if seen. Currently most confined to the front yards of two houses (4208 and 4210), with an occasional outbreak in front of the Doctors Cemetery on the corner of Sectors 9 and 11. During larger outbreaks it sometimes appears on the northwest corner of Ballfield (Sector 15). One plant was recently found near *Solanum nelsonii* (Pōpolo) plants in Sector 32; a young group of seedlings that had recently germinated were observed and pulled under the *Casuarina* spp. on the road to the now abandoned Aviary Seep.
- All parts of this plant are poisonous if ingested.

Goosefoot Family (Chenopodiaceae)



Chenopodium oahuense

Chenopodium murale (Lamb's Quarters/Goosefoot)

CHEMUR

Non-native



Key Characteristics:

- Annual, herbaceous plant growing up to 3 ft (90 cm); seedlings have cotyledons (seed leaves) that are dark green, narrow, and oblong to lance-shaped; first leaves are similar in size to the cotyledons and appear to be opposite to one another on the stem; later leaves are alternate to one another along the stem and are increasingly larger; leaf edges are weakly toothed; minute, white, dot-like scales sparsely cover the upper and especially the lower leaf surface; stalks and the lower leaf surface are sometimes purplish red.
- Mature plants have branches arising mostly from the base of the main stem; leaves are usually triangular- or egg-shaped to lance-shaped and have coarsely toothed edges with an upper dark green, glossy surface, and a lower surface that is sparsely covered with fine, white, powdery coating; leaves have slender stalks that are roughly half as long as the leaf blade; young leaves have a moist, dewy coating and a strong odor when crushed.
- Flowers are tiny, green, and stalkless, less than 0.1 in (1.5 mm) in diameter and cluster densely into flower heads, most of which are found at the tips of the main stem and branches; some flowers arise from bases of leaves in the lower portion of the stem.

General Information:

- Occurs in dunes and other sandy areas, especially on light soils; occasionally found in wetlands.
- Can grow in nutritionally poor soil; cannot grow in the shade; prefers moist soil and can tolerate drought.
- At Midway Atoll NWR, this species is targeted in the town and residence area on Sand Island for landscaping purposes; it should be removed immediately if reported on Eastern or Spit Islands.

Chenopodium oahuense ('Āweoweo)

CHEOAH

Native



Key Characteristics:

- Non-scented to lightly-scented shrub that sometimes takes on the form of a small tree; plants may be erect, ascending or prostrate, branched, and total height 1-6 ft (0.3-2 m); older branches turn gray and woody with age, while younger tissue remains pubescent, thickened, and somewhat fleshy.
- Leaves are three-lobed, with teeth rounded to obtuse, and somewhat fleshy, olive green in color with tiny hairs that give foliage a grayish or bluish silver appearance; leaves are strongly scented when crushed; flowers in small, dense clusters grouped into terminal, almost leafless panicles.

General Information:

- Endemic to Hawai'i; dispersed across the full range of dryland habitats in Hawai'i, from coastal to subalpine.
- Used in ecosystem restoration, erosion control, and enhancing diversity in riparian and other communities; will begin to spread on its own when planted together in large numbers.
- Sooty Terns (*Onychoprion fuscatus*) and Red-footed Boobies (*Sula sula*) use this plant as nesting material.
- Leaves, flowers, and fruit can range from scentless to very distinctly scented, smelling like fish; in the field it can sometimes be detected by the smell although specimens on Midway Atoll NWR are mostly scentless until they bloom.
- Prone to ants, aphids and mealy bugs; spray with soapy water, especially when propagated in greenhouse, to ensure healthy plant growth.
- Produces seed throughout the year.

Gourd Family (Cucurbitaceae)



Momordica charantia

Momordica charantia (Balsam Pear/Bitter Melon)

MOMCHA

Invasive weed: nearly eradicated



Key Characteristics:

- Annual, herbaceous, tendril-bearing vine grows to 16 ft (5 m) long.
- Leaves are simple, alternate, 1.6-4.7 (4-12) cm across, with 3-7 deeply separated lobes.
- Fruit has a distinct warty exterior and an oblong shape; it is hollow in cross-section, with a relatively thin layer of flesh surrounding a central seed cavity filled with large, flat seeds and pith; fruit is often eaten green, or as it is beginning to turn yellow; seeds and pith appear white in unripe fruits; when the fruit is fully ripe, it turns orange and mushy, and splits into segments which curl back to expose seeds covered in bright red pulp.

General Information:

- At Midway Atoll NWR, this species is currently limited to pots at a few of the residences. In the past, it has escaped and was growing near the Water Plant.
- Seeds may be dispersed by Common Mynas (*Acridotheres tristis*); no seedlings have been observed growing outside of the residence area but this species should be closely monitored and controlled.

Mallow Family (Malvaceae)



Sida fallax

Abutilon grandifolium (Hairy Abutilon)

ABUGRA

Invasive weed: nearly eradicated



Key Characteristics:

- Perennial herb or shrub up to 10 ft (3 m) tall, usually 3.2-6.5 ft (1-2 m) tall; branches covered with long and slender hairs.
- Leaves alternate, simple; petiole 2-8 in (5-20 cm) long; blade ovate, up to 8 in (20 cm) long by 6 in (15 cm), base cordate, apex acute, margin toothed, 6-7 nerved, both surfaces covered with hairs.
- Inflorescence axillary, 1-2 flowered; flower has 5 petals which unite at the base and form a small, simple yellow blossom; fruit is a subglobose schizocarp (a dry fruit that, when mature, splits up into smaller parts).

General Information:

- At Midway Atoll NWR, this species was once very prevalent in Sector 23 and the area surrounding the Doctors Cemetery and Radar Hill (Sectors 10, 11, and 12). Now only occasionally makes an appearance off the roadway in the northwest corner of Sector 13, between Radar Hill and the field well behind the Ave Maria (Sectors 16 and 19), and by the Community Garden.
- This species looks similar to *Sida fallax* ('Ilima) but can be easily identified by differences in leaf shape.

Hibiscus tiliaceus (Hau/Sea Hibiscus)

HIBTIL

Invasive weed: watch list



Key Characteristics:

- Small, evergreen shrub with, reaching heights of 13-33 ft (4-10 m), with short crooked trunk up to 6 in (15 cm) in diameter and broad crown of widely-spreading or crooked branches; may also grow more prostrate-like, with branches forming dense thickets.
- Bark gray or light brown, smooth; twigs stout, with rings at nodes, becoming brown and hairless; leaves alternate with leafstalks ranging 2-5 inches (5-13 cm) in length, with two large, short-pointed, whitish, hairy, basal scales (stipules) about 1-1.5 in (2.5-4 cm) long; blades 4-7 inches (10-18 cm) long and broad, sometimes larger, abruptly short- or long-pointed at apex and heart-shaped at base, rarely wavy toothed on edges, slightly thickened and leathery, shiny yellow green in color and hairless on upper surface.
- Flower clusters (panicles) occur at or near ends of twigs, branching; large, funnel-shaped, bright yellow flowers 3-3.5 in (7.5-8 cm) long and broad, usually with dark red "eye spot" inside, and surrounded by long-stalked, heart-shaped, and nearly round leaves; seed capsules elliptical, 1-1.25 in (2.5-3 cm) long, long-pointed, hairy, and often split into five parts.

General Information:

- At Midway Atoll NWR, almost every large gun emplacement on Sand Island has *H. tiliaceus* at the base; from each of these plantings, *H. tiliaceus* has spread and is now creating quite large and impenetrable thickets. West Beach may become completely overrun by this species, as has been done elsewhere in Hawai'i. *H. tiliaceus* also occurs around Bart Hill. Not observed on Eastern or Spit Islands.
- Though currently not providing useful habitat for many seabirds, *H. tiliaceus* could possibly provide structure for some species as *Casuarina equisetifolia* (Ironwood) are removed.

Malva parviflora (Cheese Weed)

MALPAR

Invasive weed: nearly eradicated



Key Characteristics:

- Annual broadleaf plant and occasionally a biennial or short-lived perennial plant; erect, sprawling or decumbent herb growing up to 2-3.5 ft (0.6-1 m) high that is covered with rather stiff star-like (stellate) hairs and is woody at the base.
- For seedlings and younger plants, cotyledons (seed leaves) are distinctly heart shaped, hairless, and have long stalks; they are about 0.1-0.5 in (3-12 mm) long and 0.1-0.3 in (3-8 mm) wide; stalks usually have some simple and/or star-shaped hairs; first leaf is almost round and usually a little larger than the cotyledons; true leaves are usually weakly lobed, more-or-less round with wavy, shallow-toothed edges, and have a red spot at the leaf base; leaves are alternate to one another along the stem.
- For mature plants, stems are tough and woody and grow mostly erect, and can reach over 2-3.5 ft (0.6-1 m) in length; leaves are hairy, somewhat palm shaped, with five to seven shallow lobes; lobes are rounded to angled and their edges are round toothed and vary in hairiness; leaves are alternate to one another along the stem, measuring 3-4 in (8-10 cm) in diameter; small white or pink flowers.

General Information:

- Flowers bloom nearly year-round; fruiting head resembles a miniature wheel of cheese with wedge-shaped sections.
- Primarily occurs in a few places in the town area of Sand Island; it is mainly found near the TV satellite dish, and area south of the Community Garden (Sector 19) and on both sides of the road between Sector 19 and the Senior Officers Housing (Sector 21). It occasionally occurs in a few other locations such as Sectors 12, 13, and 26. Nearly eradicated invasive weed species at Midway Atoll NWR; report if observed.

Malvastrum coromandelianum (Threelobe False Mallow)

MALCOR

Invasive weed



Key Characteristics:

- Perennial, upright sub-woody or sub-shrub plant growing up to 3 ft (1 m) in height; main stem is straight and hairy, green in color when young and turning brown as the plant matures; leaves are alternate, simple, elongated, slightly hairy at 4 points associated in pairs, and strongly toothed; leaves are 1-2 in (3-5 cm) long and 0.75-1 in (2-2.5) cm wide.
- Flowers are solitary or in small groups in terminal position or at the base of the leaves, often pale yellow to yellow-orange in color; fruits are dry, flattened, hairy, and disc-shaped parting from 10-12 wedges; each fruit has a spine to the top and two small on the sides.

General Information:

- On Midway Atoll NWR, this plant tends to appear in disarmingly small infestations but has had seasons with serious outbreaks. It has spread in Sectors 19 and 20, with other outbreaks in Sectors 26 and 28; commonly occurs by the Harbor and residence area.
- Root system consists of a deep taproot, which can be very difficult to uproot.

Sida fallax ('Ilima)

SIDFAL

Native



Key Characteristics:

- Erect to prostrate perennial herb or subshrub that grows to 1-5 ft (0.3-1.6 m) tall; ranges in habit from a prostrate to an erect shrub; prostrate forms are most often 6-12 in (15-30 cm) tall and grow in coastal areas; as a shrub, usually grows under 5 ft (1.6 m) tall, but can sometimes grow to 10 ft (3 m) tall.
- Varies from smooth to densely covered in woolly hairs, the hairs usually stellate; 2-3 in (5-8 cm) leaves are oval to almost round with a pointed end and toothed or jagged edges; upper surfaces of leaves are bright green and lower surfaces generally are densely hairy giving the leaves a lighter color and a velvety appearance; leaves are alternately arranged along the stem, and their shape varies from somewhat elongated to almost round, with serrated (saw-like) edges.
- Single tubular flower has 5 petals, is yellow to orange, and is about 1 in (2.5 cm) in diameter; flowers occur either solitarily or in clusters at the ends of the branches; flowers can be bright yellow, orange yellow, light orange, rich orange, dull or rusty red, or a rare greenish color; some forms are dark maroon at the base or have red or maroon centers; blooms throughout the year.

General Information:

- Commonly throughout Hawai'i; also widespread on islands across the Pacific Ocean to China.
- In native habitat, sometimes represents the only ground cover, aside from non-native species, on arid, rocky/sandy coastlines, and raised limestone reefs.
- Plants prone to ants, scale, aphids, mealy bugs, red spider mites, and slugs; too much shade and moisture cause this plant to get rust or black sooty mold. Also prone to chlorosis, especially when overwatered; look for yellowing leaves.
- Individual plants of this species may vary in height, density of hairs, leaf size and shape, and flower color and size; at Midway Atoll NWR, *S. fallax* observed as low-growing, dense, spreading mats.
- All the plants at Midway Atoll NWR are derived from one plant that survived many years at Midway Mall.

Morning Glory Family (Convolvulaceae)



Ipomea indica

Ipomoea aquatica (Swamp Cabbage/Water Spinach)

IPOAQU

Invasive weed: watch list



Key Characteristics:

- Floating, trailing vine with long, branching stems (reaching up to 70 ft [21 m]); stems hollow, rooting at nodes, and contain a milky sap.
- Leaves are alternate, simple, with glabrous petioles 1-6 in (3-14 cm) long; blades generally arrowhead-shaped but variable, glabrous (hairless) or rarely pilose, about 7 in (17 cm) long, with tips pointed; blades held above water when stems floating.
- Flowers are showy and have a funnel-like shape; solitary or in few-flowered clusters at leaf axils; petals white or pink-lilac in color.
- Fruit is an oval or spherical capsule, woody at maturity, about 0.5 in (1 cm) wide; holds 1-4 grayish seeds, which are often short and hairy.

General Information:

- Although *I. aquatica* has not shown signs of spreading on Midway Atoll NWR recently, it is a Federal Noxious Weed and was apparently found (and removed) at the Ballfield Seeps in the past. It can grow very quickly, especially in wet conditions, up to 4 in (10 cm) per day.
- Currently, *I. aquatica* occurs at two houses in the residence area, in the Hydroponic Garden, and in the abandoned greenhouse by the Hydroponic Garden. All of these plants are being cultivated in pots.

Ipomoea indica (Koali 'awa)

IPOIND

Native



Key Characteristics:

- Vigorous, tender, perennial vine, sometimes scrambling over low vegetation or creeping along the ground; slender stems up to 20 ft (7 m) long; stems usually develop a twining habit although they occasionally spread across the ground; stems are fairly densely covered in spreading or backwards-curved hairs when young and they occasionally also exude a white milky sap when broken.
- Leaves dark green, alternately arranged, 2-7 in (5-18 cm) long and 1.5-6 in (3.5-16 cm) wide; leaves range from heart-shaped (cordate) to three- to five-lobed shaped and have pointed tips (acute apices); both leaf surfaces are softly hairy, the undersides more so.
- Funnel-shaped (tubular) flowers bright blue or bluish-purple in color with a paler pink or whitish-pink central tube; large flowers (2-4 in [5-10 cm] long and 3-4 in [7-10 cm] across) occur in clusters of two to twelve in the leaf forks.

General Information:

- Opportunistic colonizer of open habitats and can invade a variety of habitat types, including roadsides, coastal dunes, and moist environments; indigenous to the Hawaiian archipelago and pantropical in distribution.
- Under favorable conditions of full sun, ample moisture, and fertile soil, it can grow very rapidly, smothering all other vegetation; stolons can form dense mats over the ground and can even compete with trees and shrubs. Reproduces primarily from broken fragments of stems that produce new roots at the nodes.
- Once established, produces large numbers of flowers for most of the year; flowers are short-lived and are readily replaced as they die.
- At Midway Atoll NWR, there are two distinct forms of *I. indica*: one that resembles the "native" form found throughout the NWHI (with lighter-colored, bluish flowers); and one that resemble an "ornamental" form (with dark purple flowers). "Native" form found near the Cemetery, Midway House, Parade Field, Ballfield Seeps, Midway Mall, and the residence area; "ornamental" form found at Ave Maria, Radar Hill, and Captain Brooks.

Ipomoea pes-caprae (Beach Morning Glory)

IPOPES

Native



Key Characteristics:

- Evergreen perennial that grows as a creeping vine with stems up to 18 ft (5 m) long; flexible stem, 0.5 in (1.3 cm) in diameter, branches freely; dark green, fleshy, leathery leaves are about 4 in (10.2 cm) long; leaves are notched at the apex, creating two equal lobes, making them resemble a goat's footprint.
- Flowers are trumpet-shaped, approximately 1-2 in (3-5 cm) long; pink, purple, or violet flower has five sympetalous (united or fused together) petals; flowers open late in the evening and appear their best early in the morning; flowers year-round, peaking from May through November.

General Information:

- Indigenous to the Hawaiian archipelago and pantropical in distribution; occurs on beaches and arid areas on Midway Atoll NWR, Lisianski Island, Laysan Island, French Frigate Shoals, Nihoa Island, and all of Hawai'i.
- One of the primary colonizers of beaches; grows well on nutrient-poor, moist, sandy, or calcareous soils; can also be found in wetlands and seeps but is intolerant of shade.
- Capable of absorbing water almost as salty as seawater.
- At Midway Atoll NWR, present on Sand Island, especially near the coast and in patches at Bulky Dump, along South Beach, West Beach, Mauka-Makai Ditch, Cargo Pier, around the margins of the Harbor, and in scattered restoration plantings. Also found along the northeast coast on Eastern Island but not found on Spit Island. Appears to be declining in abundance, perhaps because of non-target effects of weed control.

Mustard Family (Brassicaceae)



Lobularia maritima

Brassica nigra (Black Mustard)

BRANIG

Invasive weed



Key Characteristics:

- Annual plant, 16-32 in (40-80 cm) tall, branching occasionally; stems usually glabrous (hairless) and glaucous (blue-green or gray in color), sometimes with scattered, stiff hairs toward the base; stalked, alternate leaves are up to 10 in (25 cm) long and 3 in (6.5 cm) across, becoming smaller as they ascend the stems; lower leaves pinnately lobed and obovate in outline, tapering to a long and rather stout petiole; terminal lobe is much larger than the lateral lobes; upper surface of lower leaves often bristly with scattered hairs that are stiff, short, and white; lower surface is usually glabrous, except for a few hairs along the central vein; upper leaves often lanceolate, broadly elliptic, with 1-2 lobes or none.
- Upper stems terminate with clusters of yellow flowers; flowers measure 0.3 in (0.75 cm) across, consisting of 4 yellow petals, 4 sepals, several stamens, and a pistil; sepals initially green, but become yellow while the flower blooms; petals rounded toward their tips; each flower replaced by a slender silique (pod), about 0.6 in (1.5 cm) long, tapering to a conical beak, attached to the plant at a 45° angle.

General Information:

- At Midway Atoll NWR, most common on Eastern Island (especially eastern and northern portions) but is found near the Dump and the Empire Internet Café (Sector 37).
- According to Forest and Kim Starr, most of *Brassica* spp. plants on Midway Atoll NWR key closest to *B. juncea*. However, other specimens exhibit intermediate characters. These two species are closely related and are also known to hybridize. In addition, there may be multiple *Brassica* species on Eastern Island, possibly producing a hybrid swarm of plants.
- Grows profusely and produces allelopathic chemicals that prevent germination of native plants; it also spreads by reseeding itself.

Capsella bursa-pastoris (Shepherd's Purse)

CAPBUR

Invasive Weed



Key Characteristics:

- Annual broadleaf weed, reaching 4-20 in (10-50 cm) in height; cotyledons (seed leaves) narrowly football-shaped or egg-shaped with a rounded tip, pale green, about 0.1-0.2 in (2-5 mm) long, with tiny granules on the surface; later leaves typically toothed to deeply lobed; true leaves are covered with star-shaped hairs that distinguish shepherd's-purse from most other weed seedlings; until the flower stem develops at maturity, plant exists as a flat, basal rosette.
- For mature plants, stem is simple to branched, with short, star-shaped hairs; leaves vary in shape and are lightly covered with both simple and forked hairs; rosette leaves are about 1.2-4 in (3-10 cm) long and their edges range from nearly smooth to deeply lobed; stem leaves are sparse, reduced in size, and stalkless; leaves have toothed or lobed edges, lobed bases clasping the stem, and are alternate to one another.
- Flowers white with 4 petals on slender, spreading stalks; fruits consist of flat, heart or triangular-shaped pods making this species easy to recognize; numerous seeds with minute, net-like patterns.

General Information:

- This is a roadside spraying plant that has recently begun to appear in larger amounts due to open areas from removal of other weeds. Found on Sand Island in Sectors 12, 16, 21, and 35; on Eastern Island, found in Sectors 52, 53, 60, and near pier.

Coronopus didymus (Lesser Swinecress)

CORDID

Invasive weed



Key Characteristics:

- Low-growing or prostrate summer annual and sometimes a biennial broadleaf plant; seedlings have hairless, narrow, lance-shaped cotyledons (seed leaves) with rounded tips and long tapered bases 0.2-0.5 in (5-12 mm) long; first and later leaves are alternate to one another along the stem, divided into narrow segments, and resemble the cotyledons except that their edges often have one or more rounded coarse teeth, and there are short hairs on the tips; young plants exist as rosettes until the flower stem develops at maturity.
- Mature plants grow in a prostrate or low-growing fashion; stems may spread to almost 20 in (0.5 m) along the ground but their tips tend to rise; leaves are deeply lobed one to two times or deeply cut, but are not fully divided into leaflets (compound); leaves range from hairless to hairy and are about 0.6-3 in (1.5-7 cm) long; lower leaves grow on short stalks; upper leaves are stalkless and are alternate to one another along the stem; tiny, white, four-petaled, stalked flowers cluster along the flowering stem forming a flower head that is about 0.4-1.6 in (1-4 cm) long; flowering stems mostly arise from where the leaf stalk meets the main stem.

General Information:

- At Midway Atoll NWR, commonly found as a ground-cover species on both Sand and Eastern Islands; can form dense mats around albatross nests. It is removed in areas that have native outplantings and along roadways to keep it from spreading to other areas. Has recently become much more prevalent, most likely due to the control efforts against *Verbesina encelioides* (Verbesina/Golden Crown-Beard) and other invasive species.
- The leaves of this plant have an offensive, skunk-like odor.

Lepidium bidentatum (Kūnānā/'Ānaunau/Kūnānā Pepperwort)

LEPBID

Native: potential reintroduction



Key Characteristics:

- Annual or biennial weed, averaging 1-2 ft (30-60 cm) in height with a 1 ft (30 cm) spread; initially a low-growing rosette with pinnatifid (having leaflets arranged on either side of the stem, typically in pairs opposite each other); initial leaves are oval in shape with a smooth edge (compare to *Lepidium virginicum* [Peppergrass] rosette).
- Mature plants have leathery green leaves; growth habit and appearance very similar to *Lepidium virginicum* (Peppergrass).
- White flowers appear in small clusters at the end of upper stems.

General Information:

- Listed as "vulnerable" by the IUCN; endemic to NWHI and Hawai'i but likely extinct on Kure Atoll and Laysan Island. Becoming increasingly rare in Hawai'i.
- In 2005, reintroduced to Midway Atoll NWR from Laysan Island. Appears very similar to *Lepidium virginicum* (Peppergrass) consequently making reintroductions and management of *L. bidentatum* difficult. Currently, efforts are underway to propagate *L. bidentatum* at Midway Atoll NWR. This species appears to germinate successfully from seed.

Lepidium virginicum (Peppergrass)

LEPVIR

Invasive weed



Key Characteristics:

- Annual or biennial weed, averaging 4-20 in (10-50 cm); initially a low-growing rosette with pinnatifid (having leaflets arranged on either side of the stem, typically in pairs opposite each other) leaves up to 3 in (6 cm) long.
- Mature plants have stems that bolt upward, branching occasionally to frequently, and the plant becomes about 8-18 in (20-45 cm) tall; stems are green or slightly reddish pink, and are covered with fine white hairs that are very short; leaves are up to 3.5 in (9 cm) long and 0.75 in (2 cm) across, and usually oblanceolate or obovate; upper stems terminate in cylindrical racemes about 2-4 in (5-10 cm) long that have small white flowers; each flower has 4 white petals and 4 green sepals.
- When fully developed, frequently has a bushy appearance, particularly in the absence of much competition.

General Information:

- At Midway Atoll NWR, serious roadside spreading plant. Observed in most lawns and many open areas, with large patches in town, around Bart Hill, West Beach, and the Marine Barracks.
- Naturalized Atlantic Canaries (*Serinus canaria*) seem very fond of the seeds of this species.

Lobularia maritima (Sweet Alyssum)

LOBMAR

Non-native



Key Characteristics:

- Annual plant (rarely a short-lived perennial plant) growing to 2-12 in (5-30 cm) tall by 8-12 in (20-30 cm) broad; mat-forming plant that produces spreading mounds of well-branched stems clad with linear, lance-shaped, gray-green leaves (up to 1 in [2.5 cm] long); leaves are small, broad, alternate, sessile, quite hairy, oval to lanceolate, with an entire margin.
- Dense clusters of sweetly fragrant, tiny, white 4-petaled flowers, about 0.2 in (5 mm) in diameter, sweet-smelling; flowers are produced year-round; flowering is often so profuse that it obscures the foliage.

General Information:

- At Midway Atoll NWR, generally allowed as a naturalized plant but actively removed from native outplanted areas.
- This plant is generally tolerated across most of the atoll because it makes good habitat for wildlife (especially as nesting materials) and provides some degree of cover. However, it is also competitive for water resources; it is actively removed from Spit Island.
- Although this species is somewhat tolerated, it does little to stabilize soil. Walking through areas on Sand Island dominated by Sweet Alyssum is treacherous due to the high density of Bonin Petrel (*Pterodroma hypoleuca*) burrows under foot that are prone to collapse more so than in areas dominated by better soil binders, such as *Cynodon dactylon* (Bermuda Grass).

Nightshade Family (Solanaceae)



Solanum nelsonii

Solanum americanum (Glossy Nightshade)

SOLAME

Non-native



Key Characteristics:

- An annual or short-lived perennial herbaceous plant or small shrub growing up to 1-4 ft (0.3-1.3 m) or more tall; it is usually upright (erect) in habit, but plants may become spreading with age; rough stems and leaves are mostly hairless; leaves are alternate on the branch, and vary greatly in size, up to 4 in (10 cm) and 3 in (7 cm) broad, with a 2 in (5 cm) petiole and a coarsely wavy or toothed margin.
- Flowers are about 0.5 in (1 cm) in diameter, white or occasionally light purple, with yellow stamens; flowers occur in small clusters in the upper leaf forks and have five white petals and five yellow stamens; fruit are glossy green when young, turning black or purplish-black and remaining glossy as they mature.

General Information:

- It is not known whether this species is native or not, complicating management recommendations and actions; at Midway Atoll NWR, it is currently considered non-native and is targeted for control efforts.
- Appears during the winter months mostly surrounding the town area, specifically Sectors 23, 36, and 37. Also found at Frigate Point and along West Beach, sometimes on hard-packed surfaces. Sporadically appears throughout Sand Island. Occasionally appears on Eastern Island in Sectors 52 and 53.

Solanum nelsonii (Pōpolo)

SOLNEL

Native



Key Characteristics:

- Perennial shrub; depending on the form and origin, spreads from 2-6 ft (0.6-2 m) wide; leaves are 1-2 in (2.5-5 cm) long and usually pubescent with star-shaped (stellate) hairs; hairs can easily be seen by using a magnifying glass; thick, round leaves, blue-green in color.
- Flowers are white-tinged lavender to pale or medium purple with S-shaped yellow anthers flushed purple; flowers year-round, although sporadically; after flowering the fruits will turn green, mottled with purple or red, before maturing to blackish purple; marble-sized berries.

General Information:

- Listed as a candidate for status as an endangered or threatened species by the USFWS; this species is teetering on extinction, with the populations on Midway Atoll NWR as the last refugia for this species. Likely extinct on Kure Atoll, Laysan Island, Ni'ihau, Kaua'i, O'ahu, Maui, and Hawai'i, but has been reintroduced into some of these locations.
- On Midway Atoll NWR, this species is primarily found on Spit Island; one plant on Eastern Island and four on Sand Island. Typically grows in coastal sites in coral rubble to pure sand. Midway specimens appear morphologically distinct from *S. nelsonii* in Hawai'i; the Midway specimens are much more bush/shrub-like and have a distinct blue-green foliage.
- Nearly 400 of these plants germinated on Spit Island after the 2011 tsunami, however, the invasive *Eustachys petraea* (Finger Grass) overwhelmed all but about 30 of them.

Plantain Family (Plantaginaceae)



Plantago lanceolata

Plantago lanceolata (Narrow-leaved Plantain)

PLALAN

Non-native



Key Characteristics:

- Rosette-forming perennial herb, with leafless, silky, hairy flower stems growing up to 1.5 ft (0.5 m) by 1 ft (0.2 m).
- Seedlings have cotyledons that are needlelike, fused at the base, and hairless; first and subsequent few leaves are narrow, oblong-lance shaped, about 1-1.5 in (20-40 mm) long, and have an especially hairy base gradually tapering to a winged stalk; true leaves are broader, pale green, and have prominent parallel veins.
- Mature plant have leaves that are football shaped, about 3-10 inches (8-25 cm) long, and usually have short hairs (or occasionally long hairs); leaves spiral around a very short stem, clustering around the base of plant.
- Flower stalks grow up to roughly to 2.5 ft (80 cm) tall; flower heads consist of leafless, slender spikes of inconspicuous flowers clustered densely along an upright flowering head, usually 1-3 in (2-8 cm) long, excluding the stalk; initially the flower head looks egg shaped; open flowers have protruding white structures (stamens).

General Information:

- At Midway Atoll NWR, seems to be a problem near Cargo Pier and in the Catchment Seep area. Mostly seen in Sector 20 near the TV satellite dish, the area south of the Community Garden and the Senior Officers Housing (Sector 21). It occurs in a few other areas such as Sector 26.
- Prefers moist habitats, such as wetlands and seeps.

Purslane Family (Portulacaceae)



Portulaca lutea

Portulaca lutea ('Ihi)

PORLUT

Native



Key Characteristics:

- Non-woody, spreading, long-lived (greater than five years), perennial, succulent herb; usually covers a 1 ft (33 cm) spread, growing less than 1 ft (<33 cm) vertically; stem can be gray, light brown, green or red in color; leaves are succulent, oval to round in shape, and range in size from 0.3-1 in (1-2.5 cm).
- One to three yellow flowers occur at the ends of the stems with yellow or red anthers; observed to bloom from July through November.

General Information:

- This native purslane is not currently known at Midway Atoll NWR; readily hybridizes with the naturalized species, *Portulaca oleracea* (Common Purslane).
- Indigenous to Hawai'i and widespread throughout the Pacific Islands; in Hawai'i, this species grows on a variety of soils, including lava, coral and sand dunes, and in coastal areas from sea level to 130 feet; more common on the windward coasts than on the leeward ones.

Portulaca oleracea (Common Purslane)

POROLE

Non-native



Key Characteristics:

- Prostrate, succulent annual plant that often forms a dense mat; reddish stems originate from a central rooting point, radiating out like spokes of a wheel; stems vary in length, commonly up to 12 in (33 cm); leaves are stalkless (sessile), oval, smooth, succulent, and shiny, and vary from 0.5-2 in (1-5 cm) in length; leaves generally arranged opposite, but may also occur alternately along the stem, particularly near the base; leaves range from light green to dark green with a reddish or purplish margin; small, five-petaled, yellow flowers occur in leaf axils and open only in sunshine; flowers year-round.

General Information:

- Prolific seeder; single plant may produce 240,000 seeds, which may germinate even after 5 to 40 years.
- Can rapidly colonize any warm, moist site. A few scattered plants in the first year can become an almost solid carpet the following year.
- Plant is low in stature and forms dense mats; these vegetative mats utilize available moisture and nutrients and screen out light to the soil surface, preventing emergence of other seedlings.
- The fleshy stems and roots of *P. oleracea* can remain moist and viable for several days after being removed from the ground and can re-root to form "new" plants.
- Tolerated at Midway Atoll NWR since it somewhat fulfills the same ecological role as the native *Portulaca lutea* ('Ihi). Some specimens of *P. oleracea* could possibly be hybrids of this species and *Portulaca lutea* ('Ihi).

Spurge Family (Euphorbiaceae)



Euphorbia cyathophora

Euphorbia cyathophora (Wild Poinsettia)

EUPCYA

Invasive weed



Key Characteristics:

- Annual herbaceous plant with an upright (erect) habit and grows to approximately 2-3 ft (70-90 cm) in height; stems and branches are green in color and mostly hairless; leaves are oppositely arranged towards the base of the plant, alternately arranged along most of the stem, and are then oppositely arranged again on the uppermost parts of the stems and branches; leaves are 1-5 in (2-10 cm) long and 0.5-2 in (1-4 cm) wide; shape of the leaf blade is quite variable and ranges from fiddle-shaped (pandurate) or lobed through to oval (elliptic) or egg-shaped in outline (obovate); upper surface of these leaves is hairless (glabrous) while the under surface usually has a few close-lying (appressed) hairs; leaves at the tips of the branches (i.e. those just below the flowers) have reddish-pink colored bases and can appear to be large flower petals at a distance; stems and leaves have a milky sap.
- Leaves just below the "flowers" (cyathia) have reddish-pink colored bases (they appear to be "painted") and can easily be mistaken for large petals at a distance; inconspicuous cyathia are clustered at the tips of the branches and are yellowish-green in color.

General Information:

- At Midway Atoll NWR, tends to grow in the *Casuarina* spp. forest (Sectors 32 and 33), although dense stands can occur anywhere, seriously degrading habitat for ground-nesting birds. Monotypic stands of this plant exist in front of and on the east side of the FWS Office in Sector 37. This plant is also found in Sectors 4, 5, 27, and 28; small batches appear in the vicinity of these sectors.

Euphorbia hirta (Hairy Spurge/Garden Spurge)

EUPHIR

Invasive weed



Key Characteristics:

- Annual, prostrate or ascending herb with branches up to 1.5 ft (50 cm); slender-stemmed, many branches from the base to the top, red or purple in color; parts of the plant covered in short appressed hairs, interspersed with longer spreading hairs; leaves are opposite, elliptic-oblong to oblong-lanceolate, acute or subacute, dark green above, pale beneath, 0.5-1 in (1-2.5 cm) long, blotched with purple in the middle, and toothed at the edge; flowers unisexual, whitish, tinged with purple; fruits are yellow, hairy, keeled capsules, containing three brown, four-sided, angular, wrinkled seeds.

General Information:

- At Midway Atoll NWR, several non-native *Euphorbia* species occur, all of which look similar to one another. This species has appeared all over Sand Island (mainly along abandoned runways and other hard-packed areas) and is primarily targeted for landscaping reasons in town and native outplanting areas.
- Sun-tolerant and thrives in high traffic areas, such as roadsides and trails.

Euphorbia hypericifolia (Graceful Spurge)

EUPHYP

Invasive weed



Key Characteristics:

- Warm-climate, evergreen perennial, growing up to 2 ft (0.6 m) tall.
- Stem is 1-2 ft (0.3-0.6 m) in length, ascending, and multi-branched; stem is smooth and sometimes appears purple in color; branches are alternate and proceed from opposite sides of the stem, giving the plant a flat appearance.
- Leaves are about 1 in (2.5 cm) long, opposite, unequal at the base, and supported on very short leaf-stalks; leaves are oblong, obtuse, triple-veined from the base and serrulate, with numerous small, appressed teeth; larger leaves have purple spots near the center, which is very characteristic of the plant.
- Flowers are small and inconspicuous; clusters of flowers occur from the forks of the branches on slender stalks, measuring about 0.25 in (0.6 cm) long.
- White, milky sap is emitted when the leaves or stems are broken.

General Information:

- This species has been controlled on Eastern Island but is not monitored on Sand Island.
- At Midway Atoll NWR, several non-native *Euphorbia* species occur, all of which look similar to one another. This species appears regularly throughout the residence area all over Sand Island.
- This species, like other *Euphorbia* species, is poisonous if ingested. It produces a milky sap that is a skin and eye irritant.

Euphorbia peplus (Petty Spurge)

EUPPEP

Invasive weed



Key Characteristics:

- Erect, bright green forb, usually no higher than 8 in (20 cm); has only one stem at the base which is green to red in color, smooth, and hairless; stem divides into branches and each branch divides 3-5 times.
- Stem leaves grow alternately but the leaves on the upper branches are opposite; leaves are quite variable in shape and vary from pear-shaped to triangular or rhombic, measuring 0.4-1 in (1-3 cm) long.
- Flower is green and is a very small cyathia, which is a reduced unisexual flower surrounded by bracts (modified leaves); flowers are difficult to see since they often look like new leaves forming at the end of each stem.
- This plant exudes a milky, sticky sap when stems or leaves are broken; this sap is poisonous if ingested and can cause skin and eye irritation.

General Information:

- This species occurs over much of Sand Island, usually near or within *Casuarina equisetifolia* (Ironwood) forests. In many places, it is the only plant in the understory.
- At Midway Atoll NWR, several non-native *Euphorbia* species occur, including *E. heterophylla*, *E. hyssopifolia*, *E. maculata*, *E. milii*, *E. prostrata*, *E. pulcherrima*, and *E. serpens*; see botanical survey reports from Forest and Kim Starr for more information.

Stonecrop Family (Crassulaceae)



Kalanchoe pinnata

Kalanchoe pinnata (Air Plant)

KALPIN

Invasive weed: nearly eradicated



Key Characteristics:

- Perennial, succulent, herbaceous plant with erect (upright), glabrous (hairless) stems; usually grows 12-47 in (30-120 cm) tall, but can sometimes reach up to 78 in (2 m) in height.
- Leaves are also succulent and are either simple (particularly on seedlings) or compound (trifoliate or pinnate); relatively broad leaves have scalloped margins and are oppositely arranged and flattened; leaves are 2-10 in (5-25 cm) long and 0.8-5 in (2-12.5 cm) wide, green or yellowish-green in color, glabrous, and occur on petioles 0.8-4 in (2-10 cm) long; leaflets are oval or narrowly oval (elliptic) in shape with rounded tips (obtuse apices), and when more than one leaflet is present the terminal leaflet is usually significantly larger than the others; tiny plantlets may occasionally be formed in the scalloped (crenate) margins of these leaflets; these plantlets are more often produced if the leaves become detached.
- Bell-shaped (tubular), drooping (pendulous), flowers are up to 2.8 in (7 cm) long, arranged in branched clusters at the tips of the stems (terminal inflorescences); prominent, inflated, yellowish-green or pale green colored sepals 1-2.1 in (2.5-5.5 cm) long that are partially fused into a tube and streaked with pink or reddish colored blotches; yellowish-green to dark red colored petals 1.2-2.4 (3-6 cm) long are also partially fused into a tube that divides into four petal lobes near the tip.

General Information:

- At Midway Atoll NWR, this species has the potential to be quite invasive and should probably be monitored and controlled. Currently, this species is cultivated in pots at a few residences.

Kalanchoe tubiflora (Chandelier Plant)

KALTUB

Invasive weed: nearly eradicated



Key Characteristics:

- Annual or biannual that grows to about 3 ft (1 m) before blooming; dies back after blooming and new shoots can arise from the roots.
- Leaves are waxy with a rubber/plastic appearance, mottled with violet-brown leopard spots and frilled with plantlets (the tiny leaves that ray out in a snowflake shape from an upright central stem); leaf width varies, with plants in moist shade having wider, flat leaves and those in dry sand having narrow, more tubular leaves; leaf margin is entire except at the apex where there are five to seven teeth.
- Flowers are trumpet-shaped, 0.8-1.1 in (2-3 cm) long, salmon- to scarlet-colored and dangle in clusters from the top of the plant.

General Information:

- At Midway Atoll NWR, this species is currently cultivated in pots at a few residences but should be removed due to its potential for vegetative reproduction.
- Sometimes called the "Mother of Thousands," this species reproduces via plantlets (i.e., vegetatively) that grow on the ends of each leaf and then drop off.
- *K. tubiflora* contains bufadienolide cardiac glycosides, which can cause cardiac poisoning.

Sunflower Family (Asteraceae)



Pseudognaphalium sandwicense

Bidens alba (Spanish Needles/Beggartick)

BIDALB

Invasive weed



Key Characteristics:

- Weedy annual or short-lived perennial herb with erect, ridged, 1-4 ft (0.3-1.2 m) tall stems emerging from a strong taproot; seedlings initially put out simple, long-stalked, opposite leaves with depressed midveins; as plants get older, they produce upper foliage with compound leaves composed of 3-9 saw-toothed oval leaflets; leaves are 1-5 in (2.5-12.7 cm) long and up to 2.5 in (6.4 cm) wide, bright green on top, and hairy on the underside; major branches tend to sprawl and root at the lower nodes where they touch the ground; 1 in (2.5 cm) flowers grow in stalked clusters and look like coarse daisies with five or more white rays and pale yellow centers.
- Stays green year round, but grows and flowers most actively when the weather is hot and rainfall is plentiful.

General Information:

- Fast-growing, fast-spreading weed due to its enormous number of seeds (1,200 per plant) and the ability to re-grow from stems. In sub-tropical to tropical conditions, this plant can grow almost everywhere in full sun with little or no moisture. The most growth occurs in organic matter with loose soil; this plant also propagates well on sand.
- Infestation mostly confined to Old Fuel Farm area and abandoned runway near Catchment Seep. Also found along North Beach, in the Airport berm area (in the 40's sectors), and throughout the town area.

Calyptocarpus vialis (Straggler Daisy/Horseherb)

CALVIA

Invasive weed



Key Characteristics:

- Perennial, shade-tolerant groundcover, growing 8-10 in (20-25 cm) in height with a sprawling to prostrate habit.
- Stems are prostrate and root at the nodes; leaves form in pairs, with each set of leaves perpendicular to the preceding set so that the plants have a "cross" shape; leaves are dark green in color, opposite, oval to deltoid in shape with a toothed margin, and usually less than 1 in (2.5 cm) long; leaves have a petiole-like base that is shorter than the leaf; leaves stippled with short, light-colored hairs.
- Flowers are tiny (0.25 in [6.4 mm] across); one flower per upright stem.

General Information:

- At Midway Atoll NWR, controlled primarily in town area, residence lawns, in front of Midway House, and in areas where habitat restoration has occurred.
- Readily expands by stolons (runners) and roots easily from stems.

Conyza bonariensis (Hairy Horseweed)

CONBON

Invasive weed



Key Characteristics:

- Erect perennial, rough stem branching extensively at the base of the plant with tapered leaves covered in stiff hairs, 8-30 in (20-75 cm) in height; erect stems with stiff hairs, branching extensively at the base, decreasing upwards; narrow leaves are gray to green in color, measuring 1-2.5 in (2-6 cm) in length, coarsely toothed and covered in fine hairs; upper leaves are smaller and linear.
- Flowers are numerous on poorly arranged pyramidal panicles; flowers occur at the ends of the branches; surrounding each flower are involucrel (bell-shaped, leaf-like) bracts 0.1-0.2 in (3-5 mm) in length, the inside of each bract is white sometimes tinged purple or red.
- Distinguishing characteristics: tapered rough leaves covered with stiff hairs; a few bract hairs at apex are longer than the involucre bracts; branching at base of plant with outside stems taller than the central stem; top of the flower stalk (receptacle) is smoothly pitted.

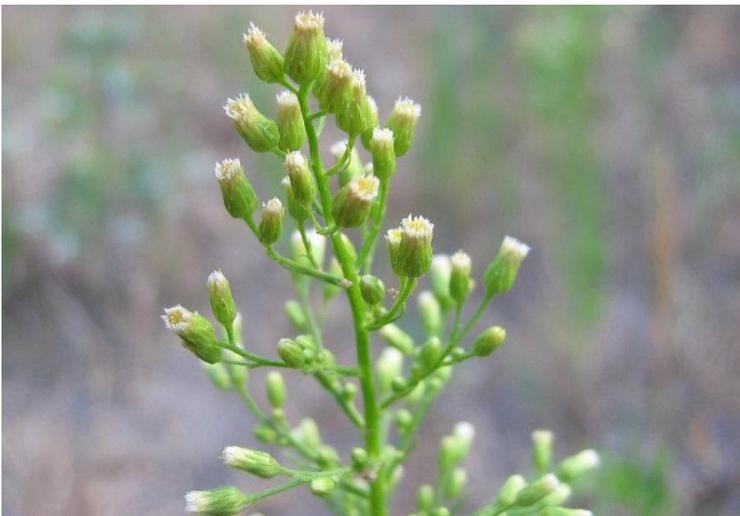
General Information:

- *C. bonariensis* can easily be confused with *Conyza canadensis* (Horseweed). *C. bonariensis* tends to branch more, has more basal leaves, and its stem usually branches near the base. The stems of *C. canadensis* usually branch only in the upper half of the plant. *C. canadensis* leaves only have short, stiff hairs, not a combination of short, stiff and long, soft hairs found in *C. bonariensis*.
- Observed around Captain Brooks and other buildings in town, the Orchard, and in Sector 22 (northern Parade Field). Also found on the sides of runways around South Beach, Bulky Dump, and the abandoned runway on Sand Island.

Conyza canadensis (Horseweed)

CONCAN

Invasive weed



Key Characteristics:

- Annual or biennial broadleaf plant.
- Seedlings have cotyledons (seed leaves) that are oval to egg-shaped, hairless to densely covered with short stiff hairs, and up to 0.1 in (about 3 mm) long; leaves attach alternate to one another along the stem; the first leaf is egg-shaped to football-shaped and is on a hairy stalk; later leaves are more or less football-shaped with slightly toothed edges.
- Young plants distinguished as leaves grow as a rosette around a crown.
- Mature plants can grow up to 6.5-10 feet (2-3 m) tall; usually a single main stem branches out from the upper half of the plant; an abundance of dark green leaves are alternate to one another along the stem.
- Many flower heads grow at the ends of branched stems; initially the flower head has an urn-shaped green base with a very small daisy-like flower (head) at the top; eventually the flower heads mature and expand into seed heads, which look somewhat similar to dandelion puffs.

General Information:

- Dense and well-established infestation at beaches (specifically Sector 17) on Sand Island; also appears in various locations in Sectors 26 and 30 as well as around town. On Eastern Island, it appears on the northeast corner of the beach and along the western side of the island; also occurs on the northeast corner of Spit Island.
- *C. canadensis* can be distinguished from *Conyza bonariensis* (Hairy Horseweed) in that unlike *C. bonariensis*, it can grow up to 4-5 ft (1.5 m) high, the involucral bracts (leaf-like structures surrounding the flower head) have a brownish inner surface, and the hairs (pappus) of the seed are cream-colored. See species account for *Conyza bonariensis*.

Gynura bicolor (Okinawan Spinach)

GYNBIC

Invasive weed: nearly eradicated



Key Characteristics:

- Perennial growing 3-13 ft (1-4 m) tall, but usually grows in a prostrate, vine-like manner; stems erect, fleshy to subsucculent, sparsely hairy.
- Leaves slender, up to 16 in (41 cm) long by 6 in (15 cm) wide (but usually half that size), usually dark green or rich purple beneath, densely to sparsely hairy, margins sharply toothed.
- Flowers dark red to orange-yellow, with hairy stems.

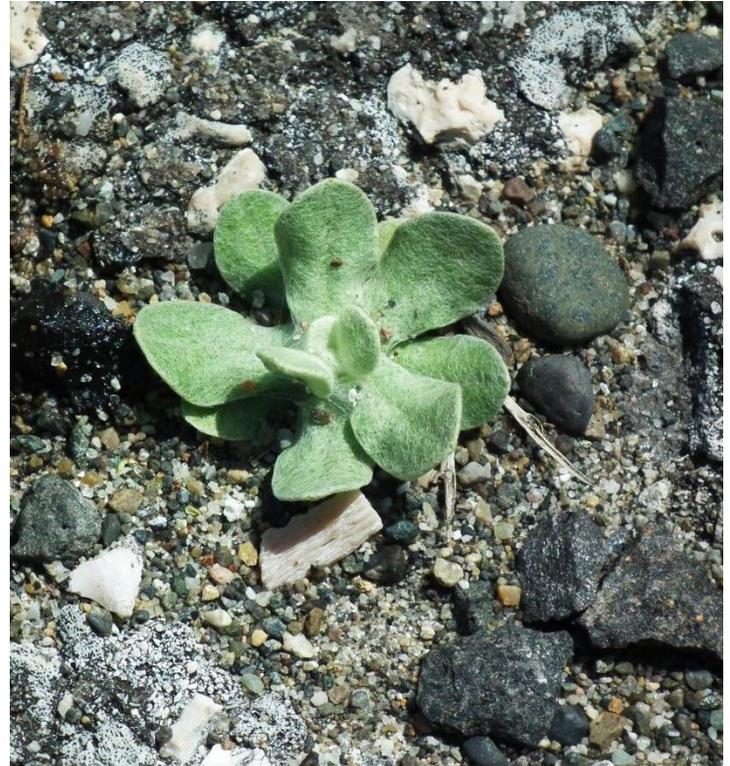
General Information:

- At Midway Atoll NWR, *G. bicolor* is found mainly in the town area on Sand Island. In addition, it is near the Water Plant, where it may be beginning to spread vegetatively (it can both root at nodes and grow from vegetative cuttings). It is also found at the smaller greenhouse next to the Hydroponic Garden and by some of the residences. Care should be taken when disposing of this plant or moving it
- Along with potential for vegetative spread, this species also potentially carries pyrrolizidine alkaloids, which are chronic liver toxins.

Pseudognaphalium sandwicense ('Ena'ena)

PSESAN

Native



Key Characteristics:

- Perennial herb, unbranched or many-branched, often fragrant or resinous-smelling, 4-25 in (10-65 cm) tall, modestly to very densely wooly; erect to prostrate stems, olive green to white or gray; leaves are simple, alternate, narrow or broad spoon-shaped, moderately or densely hairy, with lower leaves often forming a rosette; flowers are terminal clusters of heads, each around 0.1 in (2-3 mm) long and surrounded by many membranous, overlapping bracts.

General Information:

- Endemic to Hawai'i; grows in dry places such as coastal sand dunes near sea level.
- At Midway Atoll NWR, mostly grows in moist open areas; common around Old Fuel Farm, abandoned runways, cracks in the concrete by the Seaplane Hangar, Cargo Pier, Rusty Bucket, SK1 Warehouse Field, old Sunrise Seep area, Brackish Seep, and around town.

Sonchus oleraceus (Sow Thistle)

SONOLE

Invasive weed



Key Characteristics:

- Annual broadleaf plant 1-6 ft (0.2-2 m) tall, branching very little except near the apex where the flower heads occur.
- Seedlings have cotyledons (seed leaves) that are egg-shaped to narrowly football-shaped, hairless, short stalked, and about 0.1-0.3 in (4-8 mm) long; first leaf is egg-shaped, sparsely hairy, and the leaf edge is lined with backward pointing teeth; leaves are alternate to one another along the stem.
- Mature plants are coarse, erect; stem is smooth, thick, hollow between stem joints (nodes), and secretes a milky sap when cut; leaves are hairless, somewhat bluish green; upper leaves are smaller than the lower leaves, stalkless, and clasp the stems with claw-like basal lobes; lower leaves are usually about 4-8 in (10-20 cm) long, with a tapered or winged base, and are deeply lobed; terminal leaf lobes are much larger than the lateral lobes.
- Flowers year-round; flowers cluster at the stem tips to form daisy-like flower heads; when closed, the flower heads are urn-shaped; flower heads mature into white, fluffy seed heads, although not ball-shaped like in dandelions.

General Information:

- Serious invasive weed starting in about 2010; can spread even faster than *Verbesina encelioides* (Verbesina/Golden Crown-Beard).
- Known infestations northeast of pier on Eastern Island, and at Ballfield and Brackish Seeps on Sand Island. It has also appeared on the northeast end of Eastern Island (Sector 54) and near the pier (Sector 52). Report this species, if observed.

Verbesina encelioides (Verbesina/Golden Crown-Beard)

VERENC

Invasive weed



Key Characteristics:

- Annual, well-branched, grayish-green plant with mostly opposite, toothed, nearly triangular leaves and yellow flower heads that grow up to 40 in (1 m) tall, sometimes taller; leaves are simple (lobed or unlobed but not separated into leaflets); one leaf per node along the stem; leaves have toothed margins and are silvery green in color; leaves vary in shape and arrangement on the plant and are typically narrowly triangular and opposite lower on the plant and lanceolate and alternate higher on the plant.
- Flower heads are up to 2 inches (5 cm) across and have yellow disks and broad, 3-toothed, yellow rays.

General Information:

- This is the number one target weed at Midway Atoll NWR; dense, chest-high stands covered Eastern and Sand Island for over a decade, with proven negative impacts on albatross reproductive success.
- When adequately controlled, grows in low clusters, but can rapidly evolve into dense stands if ignored, especially when it grows within *Scaevola taccada* (Naupaka) stands. The seed bank of this plant permeates the entire atoll and will have to be targeted for treatment for several years to come. Research suggests an allelopathic behavior of the plant, which explains its advantage, or takeover, over other species.

Verbena Family (Verbenaceae)



Phyla nodiflora

Phyla nodiflora (Phyla/Turkey Tangle Fogfruit)

PHYNOD

Invasive weed



Key Characteristics:

- Small creeping herbaceous wildflower, growing about 1-3 in (2.5-7 cm) in height, up to 6 in (15 cm) when in flower; long, woody stem; small, greenish leaves, sometimes tinged with red or purple, with a lobed or toothed margin; flowers year-round; features tiny white flowers with purple bracts.
- Spreads and forms large, dense patches.
- Very fast growth rate.

General Information:

- At Midway Atoll NWR, serious issue around wetlands, seeps, airport extensions, and roadsides. This plant has invaded all the former Laysan Duck seeps, and became seriously entrenched at Brackish Seep. In addition, it also grows out into the Airport extension (Sector 38) where it is a threat to *Cyperus polystachyos* (Cyperus Sedge) and has outcompeted much of this same sedge species in Sector 5 at the Mauka-Makai Ditch. Common from Old Fuel Farm to Turtle Beach, in low spots along West Beach, and old Sunrise Seep area.
- Can rapidly overrun *Sesuvium portulacastrum* (Sea Purslane/'Ākulikuli) patches and even stands of sedges.
- Grows in nutrient poor soils; low salt water tolerance; does not tolerate long-term flooding by salt or brackish water.
- Moderate drought tolerance; generally requires moist soils, but tolerant of short periods of drought once established.

Woody Shrubs, Vines, and Trees



Scaevola taccada

Araucarian Family (Araucariaceae)

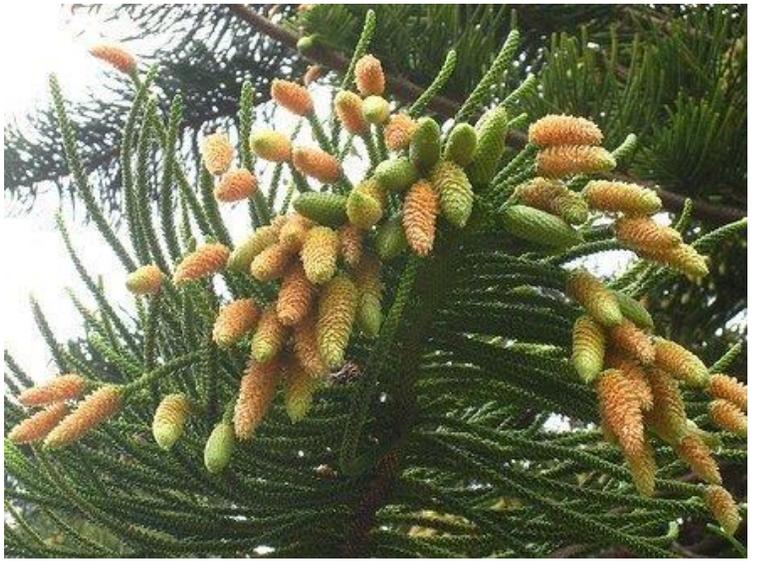


Araucaria columnaris

Araucaria columnaris (Cook Pine)

ARACOL

Non-native



Key Characteristics:

- Evergreen tree that reaches up to 130 ft (39 m) in height and 3 ft (0.9 m) in trunk diameter, with numerous horizontal lateral branches, producing the effect of a very dense and characteristic column; has a tendency to have a slight "S" curve in its trunk.
- Trunk has dark, rough and scaly brown bark that is peels off in thin horizontal strips; branches regular, with twigs spreading in one plane; twigs long and very slender, shedding; both awl-shaped and scale-like leaves;
- Leaves of juvenile plants are narrowly triangular, about 0.5 in (12 mm) long, and needle-like; adult leaves are widely ovate, about 0.25 in (6 mm) long, rigid, usually broadly scale-like, spirally arranged or nearly 2-ranked, usually closely overlapping, flattened, persistent for many years.
- Male cones hang at the tips of the lower branches and are cylindrical and 2.4-3.1 in (6-8 cm); female cones are erect, green, globose-ellipsoid in shape, and occur in the upper branches; these may be up to 4.7 in (12 cm) in diameter, with sharp tips at the ends of the scales; when mature the cones shatter to release the reddish brown scales about 4-5 cm in length, which bear the seeds.

General Information:

- At Midway Atoll NWR, most of these trees are found in the lawns in town and around residences; occasional seedlings observed below trees or in pots.

Borage Family (Boraginaceae)



Tournefortia argentea

Tournefortia argentea (Tournefortia/Tree Heliotrope)

TOUARG

Non-native



Key Characteristics:

- Shrubby, slow-growing tree grows to heights of 20 ft (6 m) or more with a canopy diameter about 1.5 times the height; distinctive small umbrella-shaped evergreen tree with very short trunk, low widely forking branches, and very broad rounded spreading crown of gray green foliage; conspicuous feature of this tree is its light green, silky, pubescent leaves, which have a silvery gray sheen.
- Bark light brown or gray, rough, very thick, deeply furrowed into narrow oblong plates and ridges; twigs stout, finely hairy, gray green, becoming brown, with raised half-round leaf scars and buds of small overlapping leaves.
- Large, hairy, somewhat fleshy leaves in whorls at the branch tips; leaves alternate, crowded near ends of twigs, gray green, covered with tiny pressed hairs, with short stout leafstalk about 0.2 in (1 cm) long; blades narrowly elliptical or obovate, 3-7 inches (7.5-18 cm) long, 1-2.25 in (2.5-6 cm) wide, thick and slightly succulent, rounded at apex, widest beyond middle, tapering to long-pointed base, not toothed, with few side veins.
- Numerous small, white to pale yellow, sessile flowers on long twisted stalks; flowers year-round; fruit rounded, flattened, about 0.25 in (6 mm) in diameter, smooth, shiny, green in color, and slightly watery.

General Information:

- Native throughout the Indo-Pacific region, except Hawai'i, where it has been introduced in modern times; naturalized at Midway Atoll NWR where it frequently grows intermixed with *Scaevola taccada* (Naupaka)
- Colonizes beaches very close to the ocean but does not tolerate inundation, so tends to die back during washovers.
- Early colonizer of hot, salty, windswept, coastal environments and is succeeded by larger, slower-growing trees.

Buckwheat Family (Polygonaceae)



Cocoloba uvifera

Coccoloba uvifera (Sea Grape)

COCUVI

Non-native: watch list



Key Characteristics:

- Large (reaching 25-30 ft [7.5-9 m]), low-branching shrub or small tree with thick, smooth branches and a stout trunk; branches low to the ground and has unusually thick trunks; bark is smooth, peeling, and grayish to mottled with patches of white, gray, and light brown; shiny, evergreen leaves are leathery, rounded with heart-shaped bases; bright green leaves are often veined in red and are about 8 in (20 cm) in diameter; leaves are green when mature, sometimes coppery when young, leathery, hairless to almost hairless.
- Fragrant, small, white flowers are on slender, terminal and lateral flower spikes 6-10 in (15-25 cm) long, followed by dense clusters of 0.75 in (2 cm) diameter green grapes (pear-shape and fleshy with a hard "stone"), ripening to a deep red or purple.

General Information:

- Native to Florida, Mexico, Central America, western South America, and the Caribbean.
- One of the first species to colonize sandy and rocky shores within its natural range, and is rarely found at any great distance from sea coasts. Highly tolerant of salt spray and salty soils as well as strong sun and wind.
- Introduced seaside ornamental plant at Midway Atoll NWR; found around the large gun emplacements on Sand Island, as well as east of Captain Brooks, along South Beach, Turtle Beach, the Finger Piers, and at Catchment Seep.

Casuarina Family (Casuarinaceae)



Casuarina equisetifolia

Casuarina equisetifolia (Ironwood)

CASEQU

Invasive weed



Key Characteristics:

- Large, vase-shaped tree that grows 100-150 ft (30-45 m) in height with wispy gray green twigs reminiscent of pine needles; stout trunk covered with thick pebbly textured reddish-brown to brownish-gray bark; weeping branchlets look pine-needle like, grayish-green, jointed, thin (less than 0.05 in [0.1 cm] wide), 4-8 in (10-20 cm) long, minutely ridged, hairy in furrows; leaves reduced to tiny scales, six to eight in whorls (a distinguishing feature), whorls encircle joints of branchlets; drab olive foliage diffuse, primarily from widely spaced branches; becomes a broad, flat-topped mature tree.
- Male and female flowers present on the same plant and are inconspicuous; male flowers occur in terminal spikes, while the female flowers are in small, axillary clusters; fruit are tiny, winged nutlets contained in woody, pointed, cone-like structures that are 0.75 in (2 cm) long.

General Information:

- Inhibits undergrowth due to aggressive and dense colonization habit and possibly to the production of phytotoxic exudations; radically alters the light, temperature, and soil chemistry regimes of beach and sandy environments, as it outcompetes and displaces native plant species and changes habitat for native wildlife.
- Very low resistance to wind, causing tree to be easily damaged during high-wind events, and generally toppling over because of its shallow root system. On Midway Atoll NWR, this species is primarily worked on around the airfield, on beaches, and in areas adjacent to buildings. *Casuarina* spp. forest is very poor habitat for seabirds at Midway NWR.

Casuarina glauca (Longleaf Ironwood)

CASGLA

Invasive weed



Key Characteristics:

- Medium-sized tree 25-65 ft (8-20 m) high, often with buttressed and fluted stem; rarely a shrub to about 6 ft (2 m) that frequently regenerates through vigorous root suckers; bark hard, gray or gray-brown, finely fissured and scaly, with a tessellated or blocky appearance; branchlets spreading or drooping, to 15 in (38 cm) long; foliage is bluish-green and segments are 0.5-0.75 in (8-20 mm) long and 0.03-0.04 in (0.9-1.2 mm) in diameter, with tiny leaf teeth in whorls of 12-17 leaves, rarely 20; leaf-teeth on new shoots is long and recurved.
- Male flowers occur in spikes 0.4-1.5 in (1-4 cm) long at the tips of branchlets; female flowers (or "cones") are 0.1-0.5 in (3-12 mm) long on stalked heads, hairy when young, reddish- to white-pubescent, becoming glabrous, about 0.2 in (6 mm), with dark red stigmas; mature woody cones subglobose to shortly cylindrical.

General Information:

- Forms a well-developed lateral root system, often with vigorous root suckers. Tolerant to periodic waterlogging, salt spray, and highly saline soils.
- At Midway Atoll NWR, this species is only targeted in a few areas near the airfield; it does not seem to be as invasive as *Casuarina equisetifolia* (Ironwood) and does not have a tendency to break and/or fall down. Found in small patches, mainly by the Seaplane Hangar, Finger Piers, behind Midway Mall, Clipper House, Ballfield Seeps, and at the far end of West Beach.

Ginseng Family (Araliaceae)



Schefflera actinophylla

Schefflera actinophylla (Octopus Tree/Umbrella Tree)

SCHACT

Non-native: watch list



Key Characteristics:

- Evergreen tree, reaching up to 25-40 ft (7.6-12 m) in height, with single or multi-stemmed trunks and greenish bark; can grow rapidly to create a dense windbreak.
- Leaves are alternate with petioles to 2 ft (61 cm) long; leaves palmately compound with mostly 7-16 leaflets, which are shiny, light green in color, oblanceolate, about 12 in (30 cm) long; margins entire or sparsely toothed when leaves are young.
- Flowers are 1 in (25 mm) across and occur in dense clusters that form a large, red, showy inflorescence at stem tips above foliage; flowers arranged like the ribs of an inverted umbrella, or like tentacles of an octopus; fruit is a purple-black, round, fleshy drupe measuring 0.25 in (7 mm) in diameter.

General Information:

- At Midway Atoll NWR, two *S. actinophylla* trees remain: one by the residences and one by the Midway Mall, both of which are quite large. No seedlings have been observed, although there is a large fruit set, available seed dispersers, and ample germination sites. Yet, for some reason this species has yet to spread on Midway.
- This species is considered an invasive weed in the several states and has also spread extensively throughout Hawai'i.

Goodenia Family (Goodeniaceae)



Scaevola taccada

Scaevola taccada (Naupaka)

SCATAC

Native



Key Characteristics:

- Dense, spreading shrub that generally grows up to 3 ft (1 m) tall, but can be up to 10 ft (3 m) tall and 6-15 ft (2-5 m) wide; medium, light green leaves are waxy, fleshy, somewhat succulent but not stiff or thick-skinned, 2-8 in (4-20 cm) long, much narrower than wide (0.7-3.5 in [2-9 cm]), broader at tip than at base; sometimes edges of leaves roll under or curve downward; leaves appear elliptical to spoon-shaped; leaves also have a broad apex with shallow indentations.
- Flowers white or cream colored, often with purple streaks, and have a pleasant fragrance; flowers occur in dense axillary clusters (at the ends of stems) and emerge in groups of three, all flowers stalked; flower composed of five petals that extend halfway around the flower, like a semi-circle; fruits are round to elliptical drupes, measuring about 0.4-0.7 in (1-1.7 cm), white to yellowish-white in color; fleshy berries; inside of fruit is spongy or corky.

General Information:

- Fruit can float for months in the ocean and still germinate after having been in salt water for up to a year; one study showed that the seeds germinated best after 250 days in salt water.
- The dominant shrub and dune stabilizer at Midway Atoll NWR, although dense stands can block seabird access to the beach. Can be useful habitat for some bird species, but will tend to dominate an area at the exclusion of most other plant species.

Leadwood Tree Family (Combretaceae)



Terminalia catappa

Terminalia catappa (False Almond/Tropical Almond)

TERCAT

Non-native: watch list



Key Characteristics:

- 30-55 ft (9-17 m) tall, deciduous tree forms a symmetrical, upright silhouette in youth with horizontal branches reaching 35 feet (10 m) in width; branches are arranged in obvious tiers, giving the tree a pagoda-like shape; crown spreads and flattens on the top to form a wide-spreading vase shape as tree matures; large, 12 in (30 cm) long by 6 in (15 cm) wide, glossy green, leathery leaves change to hues of red, yellow, and purple before dropping; leaves quickly replaced by new growth so the tree is bare for only a short period of time.
- Inconspicuous, greenish-white blossoms appear in 6 in (15 cm) long terminal clusters and followed by edible fruits; drupes are 2.5 in (6 cm) long and mature from green to yellow or red during the summer; outside husk is corky fiber with an inner thin green flesh; inside holds edible, almond-like kernel.

General Information:

- Not considered a target species for control; only fairly old trees exist with occasional saplings appearing.
- At Midway Atoll NWR, Laysan Ducks (*Anas laysanensis*) often found feeding upon fruit from this tree.

Mangosteen Family (Clusiaceae)

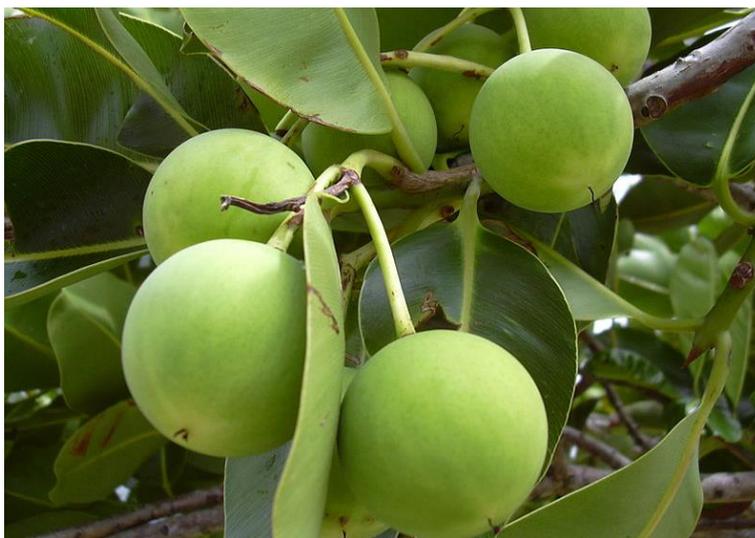


Calophyllum inophyllum

Calophyllum inophyllum (Kamani/Alexandrian Laurel)

CALINO

Invasive weed: watch list



Key Characteristics:

- Large spreading tree, reach up to 60 ft (18 m) in height, with a rounded head of dense foliage and rough gray bark.
- Leaves are large, stiff, shiny, leathery, and oblong with a blunt tip, about 3-8 in (7.5-13 cm) long, arranged opposite from one another and have closely-placed, fine, parallel veins running from a prominent raised yellow-green midrib to the leaf margin.
- White, fragrant flowers are small, 1 in (2.5 cm) wide, and have 4-8 petals; flowers have a waxy texture, quite showy with golden yellow stamens and a pink pistil, and grow in clusters of a dozen or so; flowers hang from a long stalk.
- Fruit begins pinkish-green in color, grows to about 2 in (5 cm) long and becomes bright green; when mature, fruit has a thin, leathery, dark gray-brownish skin, which covers a bony shell that holds a partly poisonous kernel or seed surrounded by a cork-like substance.

General Information:

- At Midway Atoll NWR, found near the abandoned Marine Barracks and Hangar in the past. A new tree was found in plantings along West Beach recently; monitor if more naturalized trees are discovered.

Mulberry Family (Moraceae)



Ficus microcarpa

Ficus microcarpa (Chinese Banyan)

FICMIC

Invasive weed



Key Characteristics:

- Evergreen tree, reaching 50 ft (15 m) or more in height, with a rounded dense crown; variable in habit, often epiphytic or shrub-like when young, but becomes a spreading tree with large branches in maturity, often found with numerous aerial roots hanging from trunk and branches; aerial roots can reach to soil to form pillar-like roots; leaves alternate, simple, leathery, deep glossy green, oval-elliptic to diamond-shaped, 5 in (13 cm) long, with short pointed, ridged tips.
- Flowers tiny, unisexual, numerous, hidden within the "fig," a fleshy, specialized receptacle that develops into a multiple fruit (syconium), turning from green to yellow or dark red when ripe; fruit is sessile, in pairs at leaf axils, small, 0.5 in (1 cm) in diameter.

General Information:

- Very invasive: report if observed. At Midway Atoll NWR, the pollinating Fig Wasp (*Eupristina verticillata*) associated with this species was introduced here later than in Hawai'i; consequently, *F. microcarpa* has only recently begun to spread.
- Notorious invader; seeds are capable of germinating and growing almost anywhere they land, even in cracks in concrete or in the crotch of other trees; small seedling begins to grow on its host, sending down aerial roots, and eventually strangling and replacing the host tree or structure.

Olive Family (Oleaceae)



Noronhia emarginata

Noronhia emarginata (Madagascar Olive)

NOREMA

Non-native: watch list



Key Characteristics:

- Upright oval, evergreen tree, reaching a height of 20 ft (6 m) with a 15-20 ft (4.5-6 m) spread.
- Leaves are opposite and subopposite, simple, elliptic (oval) to obovate in shape; leaves are on average 6 in (15 cm) long, leathery, olive green in color, and have a high tolerance for salt spray and wind.
- Inconspicuous but fragrant, small yellow blooms are followed by 1 in (2.5 cm) diameter, bright yellow fruits, turning to green and then dark purple, with a sweet, edible, cream-colored flesh, which add to the tree's ornamental value.

General Information:

- Though showing no sign of spread on Midway Atoll NWR yet, *N. emarginata* has spread in Hawai'i in moist areas.
- Two mature trees persist on Sand Island nearby the road along the Marine Barracks restoration area, both of which produce an abundant amount of fruit.

Olea europaea (Africa Olive)

OLEEUR

Non-native: watch list



Key Characteristics:

- Multi-branched evergreen tree or shrub, short and squat, rarely exceeding 6.5-49 ft (2-15 m) in height; trunk is typically gnarled and twisted.
- Silvery green leaves are oblong, measuring 1-2.7 in (3-7 cm) long and 0.3-1 in (0.8-2.5 cm) wide; leaves have an opposite, decussate (cross or intersect each other to form an "X") arrangement; the apex is acute with a small hook or point; leaf margins are entire and recurved, the upper surface is gray-green and glossy, and the lower surface has a dense covering of silvery, golden, or brown scales; venation is obvious on the upper surface and obscure on the lower surface; the petiole is up to 0.4 in (10 mm) long.
- Small white, feathery flowers occur on the previous year's wood, in racemes springing from the axils of the leaves.
- Fruit is a small drupe 0.4-1 in (1-2.5 cm) long and relatively thin-fleshed; has a glaucous to a dull shine when ripe, and becomes purple-black in color; contains a seed commonly referred to as a pit or rock.

General Information:

- In Hawai'i, widely cultivated as a hedge or wind break but is becoming a serious pest due to seed dispersal by game birds.
- Currently there is one *O. europaea* tree on Midway Atoll NWR (on Sand Island, about 20 m north of the Seaplane Hangar). There is a risk that ornamental olive trees can serve as a source of olive fruit flies (*Bactrocera oleae*, *Dacus oleae*), which could possibly infest other plant species.

Palm Family (Arecaeae)



Pritchardia remota

Cocos nucifera (Coconut Palm)

COCNUC

Non-native: watch list



Key Characteristics:

- Perennial palm that can live as long as 100 years, reaching a height of 65-100 ft (20-30 m).
- Single trunk, bark smooth and gray, marked by ringed scars left by fallen leaf bases; leaves range from 13-19 ft (4-6 m) long and are pinnate; they consist of linear-lanceolate, more or less recurved, rigid, bright green leaflets.
- Inflorescences, arising at leaf axils, are unbranched spadices; female flowers are borne basally, male flowers at apex; flowers bear lanceolate petals, 6 stamens and an ovary consisting of 3 connate carpels; fruit can measure up to 8-10 in (20-25 cm) in diameter and weigh 2.2-4.4 lb (1-2 kg); fruit is a drupe with a thin, smooth, gray-brownish epicarp, a fibrous, 1.5-3 in (4-8 cm) thick mesocarp, and a woody endocarp.
- One seed is contained in the fruit, which is rich in reserve substances located in the endosperm and is partly liquid (coconut milk) and partly solid (flesh); when the embryo germinates, its radicle breaks through one of the three germinating pores.

General Information:

- At Midway Atoll NWR, *C. nucifera* persists on Sand Island, mostly around town; cohorts of young plants observed under almost every palm. *C. nucifera* are trimmed in September to prevent branches and fruit from falling on Laysan Albatross (*Phoebastria immutabilis*) that congregate under them. The young fruit that germinate below the *C. nucifera* are sometimes controlled using herbicide.
- *C. nucifera* and palm parts are not allowed into the state of Hawai'i without special permits and quarantine measures

Pritchardia remota (Nihoa Fan Palm/Loulu)

PRIREM

Native



Key Characteristics:

- Perennial palm grows to only 12-15 ft (4 to 5 m) in height with a narrow trunk that is less than 6 in (15 cm) in diameter; trunk has leaf scars appearing as rings along its length that are left after leaves have fallen; leaf blades 30 in (75 cm) long and supported by a stalk or petiole up to 3 ft (1 m) long; leaf blades are said to be plicate meaning they are folded like a fan from the base to the tips of the leaf; leaves are green above and below, ruffled (wavy), waxy, deeply divided, and have drooping tips; crown is dense and untidy.
- Flowers occur in clusters that are visible beneath the leaf stalks; clusters densely branched and flowers are arranged spirally along the branches, often a distinctive orange or yellow in color; fruit are about 0.75 in (2 cm) long and 0.7 in (1.8 cm) wide and are greenish brown when mature with a shiny surface; plants may begin to flower at 5 years of age.

General Information:

- Federally listed endangered species; known from only two populations containing approximately 680 individuals in the Northwestern Hawaiian Islands (at Nihoa Island). Potential sites for re-establishment include Necker Island, Laysan Island, Midway Atoll NWR, and Kaua'i.
- It is unknown if this species of *Pritchardia* was native to Midway Atoll NWR; very few specimens persist currently.
- Provides a nesting place for Red-footed Boobies (*Sula sula*) and a perching spot for Brown Noddies (*Anous stolidus*).

Pea Family (Fabaceae)



Ricinus communis

Albizia lebbek (Siris Tree)

ALBLEB

Non-native: watch list



Key Characteristics:

- Deciduous, multi-stemmed tree growing up to 65 ft (20 m) tall, with a rounded, spreading crown and pale bark, often gray-violet in color with rusty brown pores.
- Leaves are alternate, twice compound, with 2-5 pairs of pinnae, each pinna with 3-10 pairs of leaflets; leaflets elliptic-oblong, 1-2 in (2-4 cm) long; usually asymmetrical at base, dull green above, paler green below.
- Flowers occur in showy, rounded clusters near stem tips, 2-2.5 in (5-6 cm) across, cream or yellowish-white in color; flowers have numerous long stamens and are heavily fragrant.
- Fruit is a flat, linear pod, about 1 ft (30 cm) long, with many seeds; dried pods become pale straw to light brown in color when mature and may persist after leaf-fall, often heard rattling in the wind.

General Information:

- At Midway Atoll NWR, one tree grows near the Bowling Alley and another is present next to the Midway Mall sign. Not observed on Eastern or Spit Islands. Any other naturalized trees or patches of trees should be monitored.

Erythrina variegata (Indian Coral Tree/Wiliwili Tree)

ERYVAR

Non-native: watch list



Key Characteristics:

- Large, broad, spreading, deciduous tree that can grow up to 60-80 ft (18.3-24.4 m) tall and spread 20-40 ft (6.1-12.2 m); has many stout branches that are armed with small spines.
- Leaves are compound with three diamond shaped leaflets, each about 6 in (15.2 cm) long, green and yellow-variegated in color; before the leaves come out, this tree flowers profusely with bright crimson flowers 2-3 in (5.1-7.6 cm) long in dense terminal clusters.
- Bean-like pods that follow the flowers are cylindrical, about 15 in (38.1 cm) long, and constricted between the reddish brown seeds.

General Information:

- The Erythrina Gall Wasp (*Quadrastichus erythrinae*) and the seed-boring Bruchid Beetle (*Callosobruchus maculatus*) are well-known pests that use this tree as a host. However, neither of these pests have been observed on Midway Atoll NWR. Erythrina Gall Wasps can cause reduced leaf growth, defoliation, and even tree death if the infestations are severe. Bruchid Beetles bore into seeds and legumes, either damaging or killing the seed or legume.
- Currently, *E. variegata* are found by the Midway Mall, Marine Barracks, and in the residence area; ample seeds surround these trees but no other seedlings have been observed.

Leucaena leucocephala (Koa Haole)

LEULEU

Invasive weed: nearly eradicated



Key Characteristics:

- Perennial, evergreen tree (or shrub) that grows up to 20 ft (6 m) or more, 4 in (10 cm) trunk diameter; bark light gray to brownish gray, smooth with many dots or warts (lenticels); twigs gray green and finely hairy, becoming brownish gray; leaves alternate, twice-pinnate (bipinnate), 4-8 inches (10-20 cm) long, with 3-10 pairs of lateral axes (pinnae), the axes gray green and finely hairy, with swelling at base; leaflets thin, small, gray-green, nearly hairless, narrowly oblong, and point-tipped.
- Flower heads are whitish round balls 0.25-0.5 in (10-13 mm) across on stalks of 0.75-1.25 in (2-4 cm) in terminal clusters (raceme-like) at ends or sides of twigs; each individual flower is 0.3 in (8 mm) or more in length and has a tubular greenish white, hairy, five-toothed calyx more than 0.1 in (1.5 mm) long, five narrow greenish white hairy petals nearly 0.2 in (5 mm) long, 10 threadlike white stamens about 0.3 in (8 mm) long, and slender stalked pistil nearly 0.25 in (6 mm) long; flowers and fruits year-round.

General Information:

- Nearly eradicated from Midway Atoll NWR and is contained only to Sand Island. The largest infestations were south of the Doctors Cemetery in Sector 10, the west side of Radar Hill (Sector 12), the middle of Sector 28, and north of Sector 40.
- Produces huge quantities of seeds and is adaptable, extremely fast-growing, thicket-forming, and difficult to eradicate, making it a problem weed species; aggressively controlled at Midway Atoll NWR- report if observed.

Medicago lupulina (Black Medick)

MEDLUP

Invasive weed



Key Characteristics:

- Low-growing broadleaf plant that sometimes behaving as a short-lived perennial, growing 6-24 in (15-60 cm) in height.
- Cotyledons (seed leaves) are oblong, smooth, and about 0.2-0.3 in (4-9 mm) long; first leaf is oval and broader than it is long, with a smooth edge; true leaves are fully subdivided consisting of three egg-shaped leaflets with toothed edges and resemble leaves of the mature plant.
- For mature plants, main stem branches near the base; stems grow prostrate, sometimes with tips pointing upward, and can reach 1.3 ft (40 cm) long, often light green or reddish green in color; plant is hairy, especially the stems; leaves are alternate to one another along the stem; leaves are fully divided into three egg- to heart-shaped leaflets with somewhat toothed edges; leaflets are about 0.4-0.7 in (1-2 cm) long and finely toothed at the tip, which often bares a tiny, slender tooth; stalk of the middle leaflet is longer than those of the lateral leaflets; upper surface of each leaflet has fine lateral veins that are light green and straight.
- Usually 10-20 yellow, slender, pea-like flowers densely cluster to form a rounded flower head; fruits are kidney-shaped pods about 0.1-0.15 in (2-3 mm) long, strongly veined, and black at maturity.

General Information:

- At Midway Atoll NWR, this plant has only been controlled in a few locations around town and is not considered a serious invasive weed species; removed on Sand Island where potential habitat restoration occurs.
- Common in open areas. Occurs in residence area, Bart Hill, and West Beach. Additionally, it is very abundant around gravel piles on the abandoned runway between the water tanks and West Beach.

Ricinus communis (Castor Bean)

RICCOM

Invasive weed: nearly eradicated



Key Characteristics:

- Evergreen herbaceous or semi-woody large shrub or small tree that reaches up to 40 ft (12 m) tall and 15 ft (4.6 m) wide, but may only grow to 3-9 ft (1-3 m) in temperate regions; fast-growing, suckering, colony-forming plant with tropical-looking foliage; tends to grow straight up at first, and then develops branches later; leaves are palmate, with 5-11 deeply incised lobes; leaves glossy, green to purplish or reddish-green in color, measuring 12-30 in (30-75 cm) across, with long petioles (leaf stems); stems green to reddish-purple in color and have hollow internodes.
- Greenish yellow flowers occur in spikes up to 8-18 in (20-45 cm) long near the tops of the stems; female flowers on the top half of the spike with conspicuous red stigmas (the parts that receive the pollen); male flowers on the lower half of the spike with showy yellow anthers (the parts that give off the pollen); female flowers followed by bluish (turning to reddish brown with maturity), egg-shaped capsules (fruit), about 1 in (2.5 cm) long, thickly covered with soft flexible spines.

General Information:

- Nearly eradicated across Midway Atoll NWR; report if observed. Most of this plant's distribution is limited to the Radar Hill area in Sectors 11, 12, 13, and 16. It has appeared in a few other locations in that vicinity. Also found near the Marine Barracks, Dump, Boneyard, West Beach, and the Cemetery.
- All parts of this plant are poisonous; the seeds are especially toxic.

Tamarindus indica (Tamarind)

TAMIND

Non-native: watch list



Key Characteristics:

- Slow-growing, long-lived, massive tree reaching a height of 80-100 ft (24-30 m), with a spread of 40 ft (12 m) and a trunk circumference of 25 ft (7.5 m); dark-gray, rough, fissured bark.
- Bright-green, fine, feathery foliage composed of pinnate leaves, 3-6 in (7.5-15 cm) in length, each having 10-20 pairs of oblong leaflets 0.5-1 in (1.25-2.5 cm) long and 0.2-0.25 in (5-6 mm) wide, which fold at night.
- Inconspicuous, 1 in (2.5 cm) wide flowers are yellow with orange or red streaks; flower buds are distinctly pink due to the outer color of the 4 sepals which are shed when the flower opens; fruits are flattish, bean-like, irregularly curved, bulged pods, which occur in great abundance along the new branches and usually vary from 2-7 in long and 0.75-1.25 in (2-3.2 cm) in diameter; pods may be cinnamon-brown or grayish-brown externally; later, the pod skin becomes brittle and easily-cracked; within each pod are 1-12 fully formed seeds that are hard, glossy-brown, square in form, and range from 0.4-0.5 in (1.1-1.25 cm) in diameter, each is enclosed in a parchment-like membrane.

General Information:

- Although *T. indica* is not listed as an invasive weed, it can persist and has shown the ability to reproduce on Midway Atoll NWR. One individual *T. indica* remains the Citrus Grove on Sand Island; no seedlings were observed underneath.

Sunflower Family (Asteraceae)



Pluchea carolinensis

Pluchea carolinensis (Sourbush)

PLUCAR

Invasive weed



Key Characteristics:

- Perennial shrub, 3-9 ft (1-3 m) tall and up to 2.5 in (6 cm) in basal stem diameter; stem wood is moderately soft and brittle; older plants are supported by many flexible, lateral roots and may be sparsely branched to somewhat branchy; twigs are stout; foliage concentrated on the branch ends; leaves green and almost hairless to finely haired above, paler dull green and velvety hairy below, smooth-edged or very finely toothed, petiolate, and variably ovate to elliptic in shape; leaves have petioles 0.5-1.5 in (1-3 cm) long, accompanied with blades 2-8 in (6-20 cm) long with rounded bases and pointed ends; when rubbed, leaves have an unpleasant, turpentine-like odor that can make your hands feel sticky.
- Flower heads occur as branched, flat-topped, terminal flower clusters (sometimes with more than 500 flowers each); numerous individual flower heads are small and urn-shaped; flower heads age to a rusty brown color and remain on the plant for a while.

General Information:

- At Midway Atoll NWR, seriously infested areas between Sectors 32 and 33, Sectors 40 through 44, and in areas near the abandoned runways across from Sectors 5 and 8. Large-scale removal has occurred but poses a threat of re-infesting those areas. Tolerates excessively-well to poorly-drained soils.

Verbena Family (Verbenaceae)



Lantana camara

Lantana camara (Lantana)

LANCAM

Invasive weed: nearly eradicated



Key Characteristics:

- Perennial, erect or prostrate shrub growing to 6 ft (2 m) or more in height; spiny, square stems; leaves are ovate in shape, oppositely arranged, commonly 6 in (15 cm) long and 2.5 in (6 cm) wide, with rounded tooth edges and a truncate base; to the touch, leaves feel like fine sandpaper or a cat's tongue; leaf blades are serrate and have an unpleasant aroma (like cat's pee) when crushed or rubbed;
- Flowers clustered at the tip of stems; small, multicolored flowers change color over time from white to pink or lavender, or yellow to orange or red; typically the more mature flowers are darker in color (lavender and red); fruit is tiny (0.2 in [0.5 cm] in diameter) and round; fruit initially green but change to a deep purple and eventually black color.

General Information:

- Nearly eradicated across Midway Atoll NWR but still found in Sector 22 by Brackish Seep; report if observed.
- Native species establishment is inhibited by the dense understory created by this species; it is also thought that *L. camara* produces allelopathic substances in shoots and roots which inhibits the growth and development of plants nearby.
- Flowers produced year round and plant is able to self and cross-pollinate; extremely prolific seed producer, with approximately 12,000 fruits per plant.
- *L. camara* also exhibits vegetative reproduction when its stems come into contact with moist soil, initiating root formation at the contact site. This plant can also regrow from the base of the stem, but does not sucker from damaged or broken roots.

Verbena litoralis (Vervain)

VERLIT

Invasive weed



Key Characteristics:

- Biennial or perennial shrub with erect branches, reach up to 6.5 ft (2 m) in height, base somewhat woody; leaves opposite, narrow, 4 in (10 cm) long by 0.6 in (1.5 cm) wide, margins serrate, each pair at a right angle to the next pair.
- Small flowers blue, purple, or lavender on slender terminal spikes 5 in (13 cm) long.

General Information:

- Used medicinally by Hawaiians.
- At Midway Atoll NWR, primarily infests the northwest corner of the Seaplane Hangar by Sector 35, the northwest corner of the NAF Hangar area, the area between Cargo Pier and Turtle Beach, Parade Field, and the field opposite Charlie Barracks. A few instances in the past it has appeared in those areas but has not been observed for quite a long time. Possibly near eradication- report if observed.