

## New Plant Records from Midway Atoll, Maui, and Kaho‘olawe

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The following contributions include new state, island, naturalized, and range extension records from Midway Atoll, Maui, and Kaho‘olawe. All records are for nonindigenous species. Images of most of the material examined can be seen at <[www.hear.org/starr](http://www.hear.org/starr)>. Voucher specimens are housed in Bishop Museum's *Herbarium Pacificum* (BISH), Honolulu, Hawai‘i.

### Agavaceae

*Furcraea foetida* (L.) Haw.

#### New island record

*Furcraea foetida* (Mauritius hemp) is widely cultivated for fiber and often becomes naturalized. In Hawai‘i, it is previously documented as naturalized, often locally abundant in dry to mesic disturbed sites where it spreads from bulbils rather than seeds, on all the main islands except Ni‘ihau and Kaho‘olawe (Wagner *et al.* 1999). It has recently also been found to be naturalized on Kaho‘olawe where it is locally abundant along the road to Kūheia in dry scrub.

*Material examined:* **KAHO‘OLAWA:** Kūheia, just off of Kūheia Road, plants spreading from patch about 50 m on a side, in association with *Leucaena leucocephala*, *Heteropogon contortus*, and *Prosopis pallida*, 1197 ft [365 m], 10 Feb 2008, Starr; Starr, & Higashino 080210-02.

### Amaranthaceae

*Alternanthera brasiliana* (L.) Kuntze

#### New island record

*Alternanthera brasiliana* (ruby leaf, Brazilian joyweed, alligator weed) is native from Mexico to Brazil and the West Indies, and has been reported as naturalized in Hawai‘i on O‘ahu (Wagner & Herbst 1995) and on Moloka‘i (Wagner *et al.* 1999). This upright plant with ruby red leaves and attractive small rounded spiky flowers is occasionally cultivated as a specimen or bedding plant. It occasionally escapes and is naturalized in south Florida (USDA 2009). In Arkansas, all *Alternanthera* spp., including *A. brasiliana*, are listed as noxious weeds (USDA 2009). *A. brasiliana* is here reported as a new island record for Maui where it was observed spreading from cultivated plants in and around a botanical garden.

*Material examined:* **MAUI:** East Maui, Kula, Enchanting Floral Gardens of Kula, a few patches and scattered individuals, germinating in hedges, appeared to be spreading, in association with a wide variety of ornamental plants in botanical garden, 2350 ft [716 m], 19 Feb 2008, Starr & Starr 080219-05.

### Asteraceae

*Arctotheca calendula* (L.) Levyns

#### New state record

*Arctotheca calendula* (Capeweed, Cape dandelion) is native to coastal and disturbed areas of western and eastern Cape extending to Natal, Africa (Letsela & Turner 2002). It is an annual herb or sprawling perennial growing up to 25 cm high, with basal leaves that form

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a rosette, are woolly above and have deeply divided margins; and daisy-type flowers up to 6 cm across that are a striking yellow (Letsela & Turner 2002). It is cultivated as an ornamental groundcover at least in upland areas of East Maui. Though previously not mentioned as being cultivated in Hawai'i (Staples & Herbst 2005; Imada *et al.* 2005), we first observed this species being cultivated in a botanical garden located in Kula, Maui, where it was covering large areas and scattered here and there. During follow up roadside surveys, we found this species widely cultivated and sparingly naturalized in lawns and yards in the Upcountry East Maui area from Makawao to Kēōkea. This collection represents a new state record for Hawai'i.

*Material examined:* **MAUI:** East Maui, Kula, Enchanting Floral Gardens of Kula, widely established on botanical garden grounds, sparingly naturalized, spreading by budding plants, growing with wide variety of ornamentals in upcountry botanical garden, 2350 ft [716 m], 19 Feb 2008, *Starr & Starr 080219-01*.

***Crassocephalum crepidioides* (Benth.) S. Moore New island record**

A widely naturalized species throughout the Old World, documented from relatively dry to wet areas of Kaua'i, O'ahu, Moloka'i, Lāna'i, Maui, and O'ahu (Wagner *et al.* 1999; Nagata 1995), *Crassocephalum crepidioides* (redflower ragweed) is now also documented from Kaho'olawe where it was found in a seed germination planter bail.

*Material examined:* **KAHO'OLAWE:** Pu'u Mōiwi, along bypass Rd, coming up in *Heteropogon contortus* and *Eragrostis variabilis* planter bails, in association with *Dodonaea viscosa*, *Asclepias physocarpa*, and *Chenopodium oahuense*, 1115 ft [340 m], 8 Feb 2008, *Starr, Starr, & Higashino 080208-03*.

***Montanoa hibiscifolia* (Benth.) Standl. New island record**

In Hawai'i, *Montanoa hibiscifolia* (tree daisy) was first introduced in 1919 to the island of O'ahu. It has since naturalized in disturbed dry to mesic areas on Kaua'i, O'ahu, Lāna'i, Maui, and Hawai'i (Wagner *et al.* 1999). It is reported for the first time as a new island record from Kaho'olawe, where several large flowering plants were scattered in a gully in the Upper Kaulana area near restoration plantings.

*Material examined:* **KAHO'OLAWE:** Upper Kaulana, just off Park Rd, upland dry shrubland, growing in association with *Prosopis pallida*, *Pluchea carolinensis*, *Cenchrus ciliaris*, and *Casuarina equisetifolia*, scattered patches in gully, 1100 ft [335 m], 30 Dec 2008, *Starr, Starr, & Higashino 081230-01*.

**Boraginaceae**

***Cynoglossum amabile* Staph & J.R. Drumm. New island record**

*Cynoglossum amabile* (Chinese forget-me-not) is previously recorded from Hawai'i island where it is locally common in grasslands and pastures (Wagner *et al.* 1999). On Maui, it appears to be a new ornamental that readily reseeds itself and spreads beyond where it is planted. This collection represents a new island record for Maui.

*Material examined:* **MAUI:** East Maui, 'Ulupalakua Ranch, planted in herb garden in front of store, spreading locally, 1900 ft [579 m], 25 Mar 2006, *Starr & Starr 060325-01*.

**Casuarinaceae**

***Casuarina glauca* Siebold ex. Spreng. New island record**

In Hawai'i, *Casuarina glauca* (longleaf ironwood, she oak) has been planted for ornament and in forestry and erosion control efforts and is known to persist and spread extensively

through root suckering on the islands of Midway Atoll, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Wagner *et al.* 1999; Oppenheimer & Bartlett 2000; Starr *et al.* 2002; Oppenheimer 2008). Here, it is reported as a new island record for Kaho‘olawe where it is also spreading and suckering from planted material in the Upper Hakioawa area.

*Material examined:* **KAHO‘OLAWA:** Upper Hakioawa, along access road, scattered patches, suckering from parent trees, in association with *Melinis repens*, *Cenchrus ciliaris*, and *Tamarix aphylla*, 1246 ft [380 m], 8 Feb 2008, Starr, Starr, & Higashino 080208-02.

## Cyperaceae

### *Cyperus gracilis* R. Br.

#### New island record

*Cyperus gracilis* (McCoy grass) is cultivated in Hawai‘i as a ground cover and reported as sparingly naturalized on Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Hughes 1995; Wagner *et al.* 1999; Oppenheimer & Bartlett, 2002; Starr *et al.* 2003). This small grass like sedge is reported here as a new island record for Kaho‘olawe.

*Material examined:* **KAHO‘OLAWA:** Pu‘u Moa‘ulanui, Ukumehame rain koa, North rim of Lua Makika, small patch a few meters on a side, growing amongst grasses, in association with *Dodonaea viscosa*, *Santalum ellipticum*, and *Melinis repens*, 1443 ft [445 m], 9 Feb 2008, Starr, Starr, & Higashino 080209-01.

## Fabaceae

### *Acacia retinodes* Schldt.

#### New naturalized record

Native to Australia, *Acacia retinodes* (water wattle) was first collected in Hawai‘i in 1917 by J. Rock from the island of O‘ahu (Bishop Museum 2010). In addition, forestry records show that 50 trees were planted in 1927 in the Honouliuli Forest Reserve on O‘ahu (Skolmen 1980). It was not collected again in Hawai‘i until 1999 on the island of Maui along Waipoli Rd. where several plants were found spreading from cultivated plants located nearby in a cool, moist woodland setting. This small to medium sized tree, which bears numerous small fragrant golden pompom-like flowers and attractive linear leaves, is cultivated in warm climates and has been known to escape in at least California and Florida (USDA 2009). Due to its limited distribution on Maui and potential for invasiveness, it was targeted for eradication in 2003 by the Maui Invasive Species Committee (MISC), who had removed the cultivated and naturalized plants by late 2004. After initial control, the site was occasionally monitored for seedlings with no signs of regeneration for several years. In 2009 during roadside surveys, plants were again found in the area where the naturalized plants had been removed. Though trees were only a few meters tall, they had already gone to seed again, and the site will likely need to be monitored for several years until the seed bank no longer persists. Water wattle is distinguished by the following characteristics. “Shrub or small tree; phyllodes linear-lanceolate, to 5 in long, nearly straight, with gland near base; fl. heads 1/4 in. across, in branched racemes shorter than phyllodes; fr. narrow, to 8 in. long” (Bailey & Bailey 1976).

*Material examined:* **MAUI:** East Maui, Kula, Waipoli Rd, along old road cut, mesic mid-elevation residential, farm, unmaintained area, few dozen seedlings and small trees, in association with *Pittosporum viridiflorum*, *Asparagus asparagoides*, *Eucalyptus* sp., and *Acacia mearnsii*, 3300 ft [1005 m], 13 May 2009, Starr & Starr 090513-01.

### *Adenanthera pavonina* L.

#### New island record

*Adenanthera pavonina* (false wiliwili, red sandalwood) is widely cultivated and naturalized in warm climates, and is occasionally cultivated in Hawai‘i as an ornamental or shade

tree and for reforestation. The red seeds of this species can be strung into lei (Staples & Herbst 2005). It was first reported as a new naturalized record on the island of Kauaʻi where it was spreading locally from planted trees (Wagner & Herbst 1995). It is here reported as a new island record for Maui from Nāhiku where regeneration was noted near large trees along an old trail and road.

*Material examined:* MAUI: East Maui, Nāhiku, East Maui, Nāhiku, trail to Hanawā, lowland, wet, nonnative tall forest, in association with *Miconia calvescens*, *Ardisia elliptica*, *Costus* sp, and *Mangifera indica*, two tall old trees and lots of seedlings and saplings (<1m tall), curly pods observed in canopy, 100 ft [30 m], 23 Jun 2009, *Starr & Starr 090623-01*.

***Bauhinia monandra* Kurz**

**New island record**

*Bauhinia monandra* (pink bauhinia, orchid tree, Napoleon's plume) is a medium sized tree with attractive green foliage and numerous pink flowers. It is widely cultivated in the tropics and occasionally escapes (Staples & Herbst 2005). In Hawaiʻi, it was first reported as naturalized on the island of Hawaiʻi from the south Kona district where it was observed in secondary vegetation and pasture land (Lorence & Flynn 1999). In Hāna Maui, *B. monandra* is now spreading into similar habitat from nearby park plantings, representing a new island record.

*Material examined:* MAUI: East Maui, Hāna, Pāʻani Mai Park, park and lowland, wet, semi-abandoned pasture, in association with *Spathodea campanulata*, *Digitaria insularis*, *Delonix regia*, *Artocarpus altilis*, and *Clusia rosea*, a few cultivated adults in park with a few dozen small trees in nearby pasture and lots of seedlings, 100 ft [30 m], 23 Jun 2009, *Starr & Starr 090623-02*.

***Calliandra surinamensis* Benth.**

**New naturalized record**

An evergreen shrub to small tree native to South America, *Calliandra surinamensis* (Surinam powderpuff, pink powderpuff) is widely cultivated for its fragrant pink powderpuff like blooms (GRIN 2010; Gilman & Watson 1993), and is known to escape from cultivation in Australia (PIER 2009). This colorful legume is also cultivated in Hawaiʻi and is here reported as a new naturalized record from the island of Maui where it was observed to be spreading from cultivated plants to nearby unmaintained areas in a yard and into scrub areas across the street. It can be distinguished by the following characteristics. "Spreading shrub or small tree about 2 m high (up to 6 m elsewhere). It has leaves with short petioles 6–15 mm long and 1 (infrequently 2 or 3) pair of pinnae, these 3–7 cm long and with 7–10 pairs of leaflets 10–17 x 3–5 mm. The flowers are sessile in showy heads, the calyx and corolla are green to yellowish, the filament tube is white, and the free parts of filaments are red to crimson. The fruits are oblong from a narrow base, thick-margined, 7–10.5 cm long, and 8–13 mm broad" (Smith 1985).

*Material examined:* MAUI: West Maui, Launiupoko, residential area and scrub areas nearby, in association with *Leucaena leucocephala* and *Panicum maximum*, few plants here and there, some in yard, some across street, 700 ft [213 m], 8 Jul 2009, *Starr & Starr 090708-02*.

***Cassia javanica* L. var. *indochinensis* Gagnepain New naturalized record**

*Cassia javanica* var. *indochinensis* (pink shower tree), native to northeastern India, Indochina, and southern China to Java and Sumatra, is a well known ornamental tree in Hawaiʻi (Staples & Herbst 2005). It is previously not recorded as naturalized in Hawaiʻi, but was recently found spreading in the wet lowland area of Hāna, Maui. Many small seedlings and saplings were noted in the adjacent un-maintained property, appearing to have spread from nearby large adult planted trees. This variety is also known to be natu-

ralized in Florida (USDA 2009). This common ornamental tree is distinguished by the following characteristics: tree to 35' tall; leaves about 1' long; leaflets 5–15 pairs, elliptic-oblong to oval, 1–2" long; inflorescences of racemes 6–7" long, from old bran, bracts and bractlets persistent until flowers open; flower sepal ovate, about .25" long, slightly pubescent, petals pink, fading to white, .75–0.50" long, filament of 3 longest stamens about 1.5" long, swollen near middle into ellipsoid nodule; fruit 1–2' long, straight, dark brown, ridged; seeds 50–100, reddish brown, separated by partitions, each in dry, disc-shaped capsule (Staples & Herbst 2005).

*Material examined:* MAUI: East Maui, Hāna, Hāna Hospital, wet lowland jungle / pasture bordering urban area, associated with *Spathodea campanulata* and *Pilea microphylla*, many seedlings and saplings in this area, along with some old looking original trees, 125 ft [38 m], 2 Jul 2009, *Starr & Starr 090702-02*.

***Macropodium atropurpureum* (DC) Urb.**

**New island record**

*Macropodium atropurpureum* (twining cow pea) is previously known from the islands of Kaua'i, O'ahu, Moloka'i, Lāna'i, Maui, and Hawai'i (Wagner *et al.* 1999; Oppenheimer 2003; Lorence & Flynn 2006; Oppenheimer 2008). This creeping legume is here reported as a new island record for the island of Kaho'olawe. Several patches were noted at the collection site and it is also known from the summit area and continues to spread (P. Higashino, pers. comm.).

*Material examined:* KAHO'OLAWA: LZ1, along road, patches here and there, with seedpods and numerous flowers that were being visited by monarch butterflies and white lined sphinx moths, in association with *Nicotiana glauca* and *Cenchrus ciliaris*, 1394 ft [425 m], 8 Feb 2008, *Starr, Starr, & Higashino 080208-01*.

***Trifolium campestre* Schreb.**

**New state record**

*Trifolium campestre* (field clover) is not previously known from Hawai'i. We initially identified this species (unpubl.) as *Trifolium dubium*, but the error was called to our attention by Bram D'houtd (Ghent University, Belgium) who identified the species as *T. campestre*. It is distinguished from *T. dubium* by having the following characteristics. "Corolla clearly striate; infl 0.8–1.3 cm wide, generally >20 flowered; petioles, exc of uppermost lvs, >1flts." Full description: "Annual, puberulent. Stem decumbent to erect. Leaves 1-pinnate, cauline; stipules ovate; leaflets 0.6–1.5 cm, obovate. Inflorescence head-like, ovoid to spheric; flowers quickly reflexed. Flower: calyx 1.5–2 mm, upper lobes < lower; corolla 4–5.5 mm, bright yellow, becoming brown, striate. Fruit fragile; style persistent, <1 mm. Seed 1." (Jepson Herbarium 1993). This collection represents a new state record for Hawai'i from the island of Maui.

*Material examined:* MAUI: East Maui, Polipoli, Ka'ono'ulu, occasional along side of road, forest / pasture, growing in association with *Acacia mearnsii*, *Lotus subbiflorus*, and *Medicago lupulina*, 5000 ft [1524 m], 19 Mar 2009, *Starr & Starr 090319-01*; East Maui, Polipoli, Ka'ono'ulu, occasional along side road, open pasture, growing in association with *Pennisetum clandestinum*, 4200 ft [1280 m], 19 Mar 2009, *Starr & Starr 090319-02*.

**Fumariaceae**

***Fumaria officinalis* L.**

**New state record**

*Fumaria officinalis* (drug fumitory, common fumitory) is an interesting looking purple flowered herb native to Africa, temperate Asia, and Europe that is cultivated for its medicinal properties to treat stomach, liver, kidney, and skin conditions (GRIN 2010; Wikipedia

2009; Brown 1878). It is widely naturalized throughout Canada and the United States and is listed as a seed contaminant (USDA 2009). In Hawai‘i, this species is previously not known and was recently found naturalized along a roadside on Maui in a pastoral / residential roadside setting. This new state record can be distinguished by the following characteristics. “Plants 1–7 dm. Inflorescences, excluding peduncle, 3–7 cm; bracteoles 1/2 to nearly as long as pedicels. Flowers : pedicel straight and ascending in fruit, ca 3 mm; corolla 6–9.5 mm, spur ca 2.5 mm; petals purplish pink or white near base, deep reddish purple to maroon apically. Capsules subglobose, sometimes slightly depressed, 1.5–2 mm diam., ± warty or pebbled.  $2n = 32, 48$ .” (FNA, 2009).

*Material examined:* MAUI: East Maui, Olinda, Meha Rd, sprawling herb in horse pasture near residential area, in association with *Tecoma stans*, *Pennisetum clandestinum*, and *Senecio madagascariensis*, few clumps along road, 1900 ft [38 m], 2 Jul 2009, Starr & Starr 090702-02.

### Grossulariaceae

#### *Brexia madagascariensis* Thou. ex Ker Gawl.      **Range extension**

*Brexia madagascariensis* was previously known from East Maui, where it was spreading from forestry planting in a wet lowland setting (Starr *et al.* 2003). The same is occurring on West Maui, where this tree with distinctly different juvenile and adult leaves is spreading from a forestry planting at ‘Iao Valley State Park. The original planting consisted of six trees planted in 1956 (Skolmen, 1980).

*Material examined:* MAUI: West Maui, ‘Iao Valley State Park, in plantings by stream, few large planted trees with scattered saplings nearby, in association with *Enterolobium cyclocarpum*, *Schefflera actinophylla*, and *Ficus pseudopalma*, 1000 ft [304 m], 30 Apr 2010, Starr & Starr 100430-01.

### Lamiaceae

#### *Hyptis verticillata* Jacq.

#### **New state record**

*Hyptis verticillata* (John Charles weed) originates from Central and South America (Cornell University 2009; GRIN 2010). The plant grows to a height of about 2 m and has oval leaves and white flowers (Cornell University 2009). This species was first collected on East Maui by R.W. Hobdy, S. Perlman & K.R. Wood on July 19, 1991 at Maliko Gulch off Hāna Hwy (BISH 611502), and was determined by G. Staples to probably be *H. verticillata*. The identity was later confirmed when a specimen collected by the authors in the same general area on 21 September 2002 (BISH 697612) was determined by a specialist from Kew, R.M. Harley. A third collection, again in the same general area, was made on 28 September 2002 by H.L. Oppenheimer (BISH 707311) (Bishop Museum, 2010).

*Material examined:* MAUI: East Maui, Ha‘iku Hill, Ha‘iku, scattered plants in abandoned pasture, in association with *Peltophorum pterocarpum* and *Psidium guajava*, 450 ft [137 m], 21 Sep 2002, Starr & Starr 020921-01.

### Myrtaceae

#### *Eucalyptus goniocalyx* F. v. Muell. ex. Miq.      **New island record**

*Eucalyptus goniocalyx* (mountain gray gum) was previously known to be planted and regenerating within or near plantations on the islands of O‘ahu and Hawai‘i (Wagner *et al.*, 1999). It is now also known from Maui where it is spreading from large *Eucalyptus* plantings within sub-alpine shrubland on East Maui.

*Material examined:* MAUI: East Maui, Pohakuokala Gulch, near hunter cabin, spreading from large planted grove, in gulch with *Metrosideros polymorpha*, *Leptecophylla tameiameia*, *Vaccinium reticulatum*, 6450 ft [1965 m], 17 Mar 2010, Starr & Starr 100317-01.



**Myrtaceae*****Eugenia brasiliensis* Lam.****New naturalized record**

*Eugenia brasiliensis* (Spanish cherry, Brazilian plum, grumichama) is native to southern coastal Brazil and has been widely cultivated in the tropics and subtropics for its edible fruit (Staples & Herbst, 2005). Introduced in Hawai‘i perhaps as early as 1791, it was once a popular ornamental plant and likely persists today in older gardens and collections (Staples & Herbst, 2005). The earliest collection from Maui is from 1932 from cultivated specimens at the old Baldwin home in Wailuku (Bishop Museum 2010). Though long cultivated in Hawai‘i, this species has not previously been recorded as naturalized. It was recently found to be naturalized in wet, disturbed lowland secondary forests and gulches in the Ha‘ikū vicinity of East Maui, representing a new naturalized record for the state of Hawai‘i. Though recorded as a host of the rust fungus *Puccinia psidii* as early as 1918 in its native Brazil (Simpson *et al.*, 2006), we did not observe *E. brasiliensis* to be infected with the rust, though *Syzygium jambos* nearby in Ha‘iku was infected. Staples & Herbst (2005) provided the following description. “Slender tree 25–35' tall. Leaf blades oblong-ovate, 3.5–5" long, 1–2.25" wide, leathery, glossy, both sides minutely pitted, margins recurved. Inflorescences in terminal cluster on bran, or flowers solitary, pedicels 1.25–2" long. Flower sepals 4, green; petals 4, white; stamens to 100; anthers pale yellow. Fruit flattened-globose, 0.5–0.75", red turning dark purple-black when ripe, flesh juicy, apex capped by persistent sep. Seeds 1–3, to 0.5" wide, pale tan to greenish grey.”

*Material examined:* **MAUI:** East Maui, Ha‘ikū, Ulumalu Gulch, lowland, wet, disturbed forest roadside and gulch, in association with *Schinus terebinthifolius*, *Leucaena leucocephala*, and *Syzygium jambos*, lining roadside and spreading into nearby shaded gulch, tasty purple to black fruits, 550 ft [178 m], 16 Jun 2009, *Starr & Starr 090616-01*.

**Onagraceae*****Oenothera speciosa* Nutt.****New naturalized record**

*Oenothera speciosa* (pink evening primrose) is reported as cultivated in Hawaii (Staples & Herbst 2005), and there are specimens from O‘ahu and Hawai‘i islands (Bishop Museum 2010). Here we document the presence of this pink prostrate perennial on Maui, where it was found during botanical garden surveys, and identified by W. Wagner. In the botanical garden, this pink primrose has spread beyond where it was originally planted, over-running nearby plants. This is one of the most commonly cultivated species of *Oenothera*, and is listed as escaped in many parts of the world, however is generally self-incompatible, so cannot produce seed, and is instead usually spreading through a great system of rhizomes (W. Wagner, *pers. comm.*).

*Material examined:* **MAUI:** East Maui, Enchanting Floral Gardens of Kula, spreading locally in botanical garden, 2360 ft [719 m], 30 Apr 2009, *Starr, Starr & Takeda 090430-01*.

**Piperaceae*****Piper auritum* Kunth****New island record**

A widespread weed of the Pacific, *Piper auritum* (false ‘awa) is cultivated for medicinal or culinary purposes, or because it is mistaken for ‘awa (*Piper methysticum*). It was first reported as a new state record for Hawai‘i from the islands of Kaua‘i and O‘ahu where it was spreading rapidly from cultivated plants (Staples *et al.* 2006). Staples *et al.* (2006) added that this species would likely naturalize everywhere it was planted. This hardy plant is also known from Maui where it readily spreads from cultivated plants, thrives in wet

lowland disturbed sites, is becoming more common in the landscape, and is difficult to remove once established.

*Material examined:* **MAUI:** East Maui, Nāhiku, lowland wet disturbed forest, cultivated patch in yard, spreading into nearby areas, 500 ft [152 m], 12 Dec 2000, *Starr & Starr 001212-02*.

## Poaceae

### *Eragrostis superba* Peyr.

#### New island record

Herbst & Clayton (1998) first reported *Eragrostis superba* (Wilman love grass) as a new state record from the island of Hawai‘i where it was growing in a pasture. On Maui, this grass was also recently collected from naturalized plants along a dry lowland roadside on Maui representing a new island record.

*Material examined:* **MAUI:** East Maui, Haleakalā Hwy and North Firebreak Rd, scattered plants on side of road and down embankment, plants about 1 m tall, growing in association with *Cenchrus ciliaris* and *Cynodon dactylon*, 100 ft [30 m], 20 Feb 2008, *Starr & Starr 080220-01*.

### *Eriochloa procera* (Retz.) C. E. Hubb.

#### New state record

*Eriochloa procera* (tropical cupgrass) [also known as *E. fatmensis*] is previously not known from Hawai‘i. It is reported here as a new state record for Hawai‘i from Midway Atoll. Tropical cupgrass is native to southeastern Asia, Burma, India, Ceylon and Tropical Africa (Smith 1979). This species is naturalized in tropical Asia, a few of the United States (California, Arizona, and Mississippi), and Pacific Islands, such as Fiji where it is a fairly common weed of gardens, roadsides, and other disturbed lowland sites (GRIN 2010; USDA 2009; PIER 2009). On Midway Atoll, this grass was locally abundant in and limited to a grassy lawn area located near the Cargo Pier. This site is where other new grass records have also been recorded. FWS crews are currently working to control this new grass. It is distinguished by the following characteristics. “Annuals or perennials; panicle terminal, of several to many racemes, these spreading or appressed, generally approximate along a common axis; spikelets pubescent, solitary, occasionally in pairs, short-stalked or sessile, in 2 rows on one side of a narrow rachis, the lower rachilla joint thickened, forming a dark-colored, ringlike callus below upper glume; fertile lemma indurate, mucronate or awned, the margins slightly inrolled.” (Smith 1979).

*Material examined:* **MIDWAY ATOLL:** Sand Island, Cargo pier, field *makai* of Nimitz Ave. between Roberts and Cannon Ave., filling large area of the field on the *makai* side, at least dozens of clumps, in field with other grasses and weeds including *Cenchrus ciliaris*, *Cynodon dactylon*, *Desmanthus pernambucanus*, 10 ft [3 m], 11 Jun 2008, *Starr & Starr 080611-01*.

### *Pennisetum polystachion* (L.) Schult.

#### Range extension

Previously reported by Starr *et al.* (2002) from the Kahului area of Maui, *Pennisetum polystachion* (blue buffel grass) was also recently collected from Olowalu, representing a range extension of this lowland grass.

*Material examined:* **MAUI:** West Maui, Olowalu, dry roadside, growing in association with *Cenchrus ciliaris* and *Pithecellobium dulce*, 10 ft [3 m], 8 Jul 2008, *Starr & Starr 090708-01*.

### *Pennisetum purpureum* Schumach.

#### New island record

*Pennisetum purpureum* (elephant grass, napier grass), a widely cultivated African pasture grass, is previously reported in Hawai‘i from the islands of Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Wagner *et al.* 1999; Oppenheimer 2003). This robust grass is now reported as a new island record for Kaho‘olawe where a single clump was found in the Upper Kaulana area.



*Material examined:* **KAHO‘OLAWÉ:** Upper Kaulana, just off Park Rd., upland dry shrubland and restoration area, growing in association with *Lantana camara*, *Dodonaea viscosa*, and *Waltheria indica*, one clump a few meters tall, 1246 ft [380 m], 8 Feb 2008, *Starr, Starr, & Higashino 081230-02*.

***Sporobolus pyramidatus* (Lam.) Hitchc.**

**New island record**

Wagner *et al.* (1999) listed *Sporobolus pyramidatus* (dropseed) as adventive in coastal areas of Kure Atoll, Laysan, French Frigate Shoals, and O‘ahu. It has since also been documented from Midway Atoll, Kaua‘i, and Moloka‘i (Starr *et al.* 2009; Wood 2006; Starr *et al.* 2006). In 2008, a collection was made from a patch of this grass that was found at Honokanai‘a in a sandy area near the access road and recent restoration plantings. This collection represents a new island record for Kaho‘olawe.

*Material examined:* **KAHO‘OLAWÉ:** Honokanai‘a, just between beach and boneyard, several dozen plants scattered along the back side of the beach in association with *Sporobolus virginicus*, *Verbesina encelioides*, and *Sida fallax*, 10 ft [3 m], 10 Feb 2008, *Starr, Starr, & Higashino 080210-01*.

**Polygalaceae**

***Polygala virgata* Thunb.**

**New state record**

*Polygala virgata* (purple broom) is slender shrub with sprays of purple pea like flowers and linear leaves that is drought tolerant and can be grown as an ornamental plant. It is native to tropical and East Africa southwards through Natal, Transvaal, and into the Cape, growing at elevations between 820–5905 ft [250–1800 m] (Jodamas 2004). Though previously not reported from the state of Hawai‘i, this species was found spreading from cultivated plants in a botanical garden on Maui. It was also reported by Patti Welton (NPS) who had observed this species on the side of the road, also in the Kula area, but a bit further west and higher in elevation. It is here reported as a new state record for Hawai‘i from the island of Maui. It is distinguished by the following characteristics. “*Polygala virgata* is an erect, evergreen shrub and grows to a height of 1,5 to 2,5 m. A single stem is formed at the base of the plant and slender hairless branches occur at the top. Simple leaves are alternately arranged on younger branches and usually drop before flowering. The leaves are narrow in shape, dark green with a velvety texture and 10 mm in length. Drooping racemes of deep purple magenta flowers are borne at the ends of branches. The flowers look similar to that of a pea family Fabaceae, but are different. The flower is enclosed by 2 large purple bonnet-like bracts and streaked with darker veins. These open to show that the flower has a purple tuft of tiny hairs at the top of the lower keeled petal. The outer two petals surround the lowest petal like a bonnet. The purple tuft of hairs is a distinctive characteristic to identify all polygalas. Peak flowering time is from September to February. The fruit is a two-celled capsule and the seed is small, black and oval shaped.” (Jodamas 2004).

*Material examined:* **MAUI:** East Maui, Kula, Enchanting Floral Gardens of Kula, local in one area of garden with many 2–4 m tall plants suckering, growing in association with a wide variety of ornamental plants in botanical garden, 2350 ft [716 m], 19 Feb 2008, *Starr & Starr 080219-10*.

**Rubiaceae**

***Galium aparine* L.**

**New island record**

*Galium aparine* (stickywilly) is soon to be reported as a new state record from Moloka‘i. It is also known from Maui where it was found sprawling about the vegetation along a road in Kula.

*Material examined:* **MAUI:** East Maui, Kula, Kepa Rd, locally common, growing in dry, grass scrub, along road and under trees in association with *Acacia mearnsii*, *Hedera helix*, and *Jacaranda mimosifolia*, 3250 ft [991 m], 19 May 2009, *Starr & Starr 090519-02*.

***Rubus discolor* Weihe & Nees**

**New island record**

Previously mentioned as present on Maui (Kaulalewelewe and between Kahanaiki & Mahinahina Streams, West Maui), but only known to be naturalized on O'ahu (Lanipo Trail) (Conant, 1996; Wagner *et al.*, 1999; Bishop Museum, 2010), this spiny vine with pale leaf undersides is indeed naturalized in multiple locations on Maui, where it can be found in mesic to wet areas.

*Material examined:* **MAUI:** East Maui, in pasture off Crater Rd, *Pennisetum clandestinum* is dominant in this actively grazed area, 4600 ft [1402 m], 23 Nov 2005, *Starr & Starr 051123-01*.

**Sapindaceae**

***Cupaniopsis anacardioides* (A. Rich.) Radlk. New naturalized record**

*Cupaniopsis anacardioides* (carrotwood), native to Australia, Indonesia, and New Guinea, is cultivated in tropical areas as a landscape tree with attractive pinkish bark (Lockhart, 2009). It readily spreads from cultivation via bird dispersed fruit and is naturalized in a variety of habitats in Florida where it is now listed as a state noxious weed (Lockhart, 2009). In Hawai'i, carrotwood is cultivated as a street tree and in yards. After roadside surveys on Maui in 2009 it was found to be not that common in landscaping though did show signs of reproduction and spread in a few areas where it was found, including Wailea. It can be distinguished by the following characteristics. "Carrotwood is a fast-growing evergreen tree that grows to a height of about 35 feet. The leaves are large and compound, made up of four to ten oblong leaflets, each 4 to 8 inches long, and attached by a swollen stalk. Leaflet edges tend to be wavy with rounded tips that are often indented. Leaves alternate along the stems. In Florida, flowering occurs in the winter, from January to March. Clusters of small, greenish-white flowers are borne on stalks that emerge from leaf axils. Flowers are unisexual, with each flower cluster containing both male and female flowers. The brightly colored fruit is a yellow, three-lobed capsule which, when ripe (May to June) splits open to expose three shiny black seeds encased in red or orange fleshy tissue." (Lockhart, 2009). This collection represents a new naturalized record for Hawai'i from the island of Maui.

*Material examined:* **MAUI:** East Maui, Wailea, Keawakapu, beach park, planted near parking area and spreading locally, mature trees with scattered seedlings and saplings in area, growing in association with *Nerium oleander* and *Ipomoea obscura*, 30 ft [9 m], 19 Aug 2009, *Starr & Starr 090819-01*.

**Range extensions**

The following specimens were collected at an elevation of 10,000 ft [3050 m] at the Haleakalā Observatories facility on Pu'u Kolehale, on the summit of East Maui. These new high elevation records extend the known altitudinal range of these species in Hawai'i. Previous high elevations are from Wagner *et al.*, 1999.

Family	Species	Prev. High Elev.	Date	Voucher
Fabaceae	<i>Vicia sativa</i> L. ssp. <i>nigra</i>	6988 ft [2130 m]	4 May 2009	090504-06
Malvaceae	<i>Malva neglecta</i> Wallr.	7086 ft [2160 m]	4 May 2009	090504-07
Poaceae	<i>Bromus diandrus</i> Roth	7447 ft [2270 m]	28 June 2009	090628-01

Family	Species	Prev. High Elev.	Date	Voucher
Poaceae	<i>Dactylis glomerata</i> L.	7513 ft [2290 m]	28 June 2009	090628-02
Poaceae	<i>Festuca rubra</i> vel. aff. L.	7020 ft [2140 m]	4 May 2009	090504-01
Poaceae	<i>Poa annua</i> L.	6000 ft [1830 m]	4 May 2009	090504-03
Poaceae	<i>Vulpia bromoides</i> (L.) Gray	8500 ft [2590 m]	4 May 2009	090504-05
Poaceae	<i>Vulpia myuros</i> (L.) C. Gmelin	8500 ft [2590 m]	4 May 2009	090504-04

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