Oregon Department of Agriculture
Noxious Weed Pest Risk Assessment for
Cape ivy
Delairea odorata
Asteraceae
December 2014

Findings of Review and Assessment: Cape ivy meets the criteria of an "A" listed noxious weed as defined by the Oregon Department of Agriculture (ODA) Noxious Weed Policy and Classification System. This determination is based on two independent risk assessments following a literature review. Using a rating system adapted from United States Department of Agriculture, Animal and Plant Health Inspection Services, Plant Protection and Quarantine (USDA-APHIS PPQ) Weed Risk Assessment Guidelines, Cape ivy scored 58 out of a potential score of 90. Using the ODA Noxious Weed Rating system, the species scored 19, indicating an "A" listing.

Introduction: Cape ivy is a hardy perennial vine that can invade various plant communities, while most destructive in coastal riparian habitats. Cape ivy is an escaped ornamental plant with long stems, glossy light-green leaves, small yellow flowers, and an extensive rhizome system. Vines form dense mats of vegetation that extend over trees and shrubs, killing understory plants. Cape ivy contains pyrrolizidine alkaloids (liver toxins) and can be toxic to animals when ingested; fish can be killed when plant materials are soaking in waterways (Bossard, 2000). Cape ivy is considered to be highly invasive in California, Hawaii, England, New Zealand, and Australia.

Reproduction: The growth habit of Cape ivy is similar to English ivy as long stems up to 9 meters long extend over shrubs and up tree trunks and into tree canopies. Cape ivy thrives in shaded canopy systems, particularly coastal riparian zones (DiTomaso, 2007). Spread is primarily by vegetative means, as pieces of Cape ivy re-root easily. Spread along waterways following mechanical control methods should be prevented and monitored closely. Spread during flood events has been reported in California (Nelson, 1999). A more likely source of spread is via yard waste/green waste. A small percentage of seed is thought to be viable, achenes with wispy wind-borne pappus facilitating spread. Plants reproduce primarily from fragments of rhizomes, stolons, and stems. An inch-long stem fragment with a node can generate a new plant; even fragments of dying plants have been seen to re-root (Bossard, 2000). While Cape ivy does flower and set seed, most seed produced are not known to be viable. A small percentage of seeds produced at California and Oregon infested sites have been found to be viable and have the ability to disperse long distances by wind (Cal-IPC Assessment, 2004).

Cape ivy in Curry County

Factors Effecting Establishment: Once established, Cape ivy can quickly develop a dense cover that outcompetes other vegetation in natural areas. Underlying plants are smothered resulting in reduced species richness and seedling recruitment (Cal-IPC Assessment, 2004). This invasive vine tolerates serpentine soils. While year-round moisture is typically required for initial introduction, established populations can survive drought conditions.

Probability of Detection: Cape ivy is a climbing vine and therefore once large stands are established the possibility for detection is favorable. That said, a targeted survey for vines with smaller, shiny, and lighter green leaves would be necessary to distinguish from English ivy and wild Oregon grape. Cape ivy is evergreen in mild climates, leaves and stems deciduous elsewhere (DiTomaso, 2007).

Distribution in Oregon: Cape ivy is native to the moist mountainous forests of South Africa. Believed to have been introduced into the United States as a houseplant in the late 1800s (Alvarez, 1997). Cape ivy is considered invasive in California, Hawaii (Maui and Big Island), England, New Zealand, and Australia (Bailey and Bailey 1976, NSW Agriculture 1993, PLANTS 2001, CalEPPC 1999). D. odorata is a noxious weed in New Zealand (Haley, N. 1997) and Australia (NSW Agriculture 1993). In California, D. odorata is listed on the California Invasive Plant Council's exotic pest plant list as an A-1 in invasive plant (most invasive wildland pest plant). In the western United States, Cape ivy is known to occur in Oregon, California, and Hawaii. Note that the Montana Record has been confirmed inaccurate (Pers. Comm. Montana Dept of Ag in December, 2014). Curry County is the only known county in Oregon with Cape ivy populations. There are five known patches of Cape ivy scattered from just north of Ophir to the Pistol River. Four of the five patches are rather small, the most extensive infestation occurring at a historic, one-room schoolhouse that now serves as the base for a guided horse-riding venture.

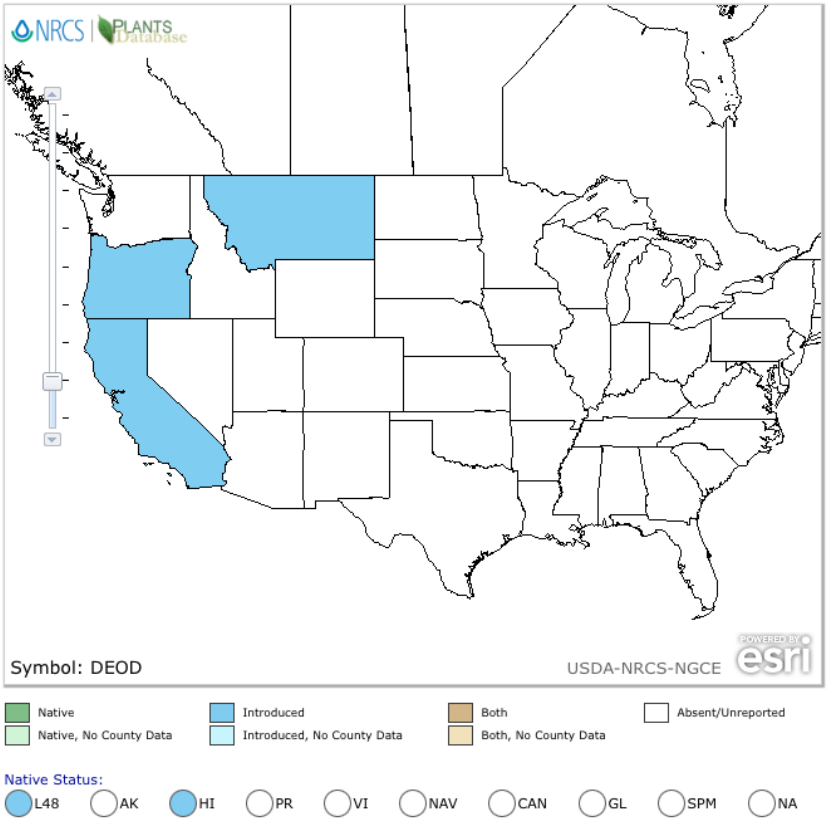
Environmental Impacts: Cape ivy can invade different habitat types ranging from disturbed to native ecosystems and occurs in both dry to moist conditions. In California, Cape ivy has proven problematic in coastal riparian areas, inland riparian areas, moist forests, and oak woodlands (DiTomaso, 2007). Whether escaping from gardens, or areas where it was dumped as garden waste, the plant moves aggressively to form dense stands that shade out and dominate less tenacious native plants. Cape ivy acts much as English ivy does by reducing plant species diversity to a low level. Abundance of native seedlings was significantly lower in plots invaded by Cape ivy compared to uninvaded plots (Alvarez, 2002). D. odorata has also been implicated in reducing numbers of native insect fauna potentially threatening other species relying on those invertebrates (Alvarez 1997). Due to a shallow root system, cape ivy can contribute to soil erosion problems on hillsides and impact flood control functions along streams (Bossard, 2000). Cape ivy contains 11 potent alkaloids including pyrrolizidine which when leached into waterways can be toxic to animals and fish, as demonstrated in aquarium studies (Cal-IPC Plant Assessment, 2004). Human health impacts have been reported in at least one case of a severe allergic reaction in California (Starr, 2003).

Economic Impacts: The value of sales to these stores is not known. The Oregon Association of Nurseries producers guide listed no growers of D. odorata in Oregon. Cape ivy has been listed in the Sunset Western Garden Book as a hardy ornamental vine (CalIPC Plant Assessment, 2004). The potential economic impact is difficult to estimate. Based on reports from other states and countries, impacts to coastal riparian habitats, native plant and associated invertebrate and vertebrate populations, recreational opportunities, property values could be realized in Oregon. Impacts from English ivy in Oregon might be the best predictor of invasion impacts by Cape ivy.

Control: Mowing is not recommended due to ability to re-sprout from small fragments of stolons and rhizomes. Burning has not been found to be effective. Leaves and stems can be toxic to livestock (although rare) and therefore grazing is not a recommended control option. Repeated manual removal, including roots and rhizomes can be effective in reducing large infestations; follow-up removal of resprouts is important. In large patches, Cape ivy can be cut at ground level and rolled up like a carpet; peeling back it's edges and cutting off upward movement into the canopy (Alvarez, 1997). Once above ground ivy is removed, a second clearing of below ground rhizomes is conducted. At a two-three month interval, resprouts that are more easily detected are targeted for removal.

Combining manual removal methods with herbicide application has been found to be the most effective control combination. Clopyralid, Triclopyr, and glyphosate have been found to successfully control Cape ivy (DiTomaso, 2013; Bossard, 2000). Reports of year-round efficacy reported, although some recommend late summer/fall treatment window.

Extensive research in finding potential biological control agents for Cape ivy has been conducted by the USDA-ARS. A galling fly, Parafreutreta regalis, a small leaf-mining moth, Acrolepia, and a defoliating moth, Diota rostrata have been considered as prospective agents over the last two decades. No agents have been approved for release in the United States. In 2013, a moth, Secusio extensa was approved for release in Hawai'i for fireweed control; known impacts to six non-native species were known prior to release. Reports of dramatic impacts to Cape ivy, one of the six off-target species, are being reported in 2014 (MISC, 2014). This moth will not receive approval for release on the mainland due to potential impacts to valued native plant species.



Cape ivy distribution in the US

Noxious Weed Qualitative Risk Assessment 3.8
Oregon Department of Agriculture

Common Name: Cape ivy
Scientific Name: *Delairea odorata*
Family: Asteraceae

For use with plant species that occur or may occur in Oregon to determine their potential to become serious noxious weeds. For each of the following categories, select the number that best applies. Numerical values are weighted to increase priority categories over less important ones. Choose the best number that applies, intermediate scores can be used.

Total Score: **59** Risk Category: **A**

GEOGRAPHICAL INFORMATION

1) 6 **Invasive in Other Areas**

0 Low- not known to be invasive elsewhere.
2 Known to be invasive in climates dissimilar to Oregon's current climates.
6 Known to be invasive in geographically similar areas.

Comments: California Coastal Riparian Areas

2) 6 **Habitat Availability:** Are there susceptible habitats for this species and how common or widespread are they in Oregon?

1 *Low* – Habitat is very limited, usually restricted to a small watershed or part of a watershed (e.g., tree fern in southern Curry County).
3 *Medium* – Habitat encompasses 1/4 or less of Oregon (e.g., oak woodlands, coastal dunes, eastern Oregon wetlands, Columbia Gorge).
6 *High* – Habitat covers large regions or multiple counties, or is limited to a few locations of high economic or ecological value (e.g., threatened and endangered species habitat).

Comments: Though currently confined to the south coast, northward movement is possible putting significant coastal acreage at risk.

3) 0 **Proximity to Oregon**: What is the current distribution of the species?

0 *Present* – Occurs within Oregon.
1 *Distant* – Occurs only in distant US regions or foreign countries.
3 *Regional* – Occurs in Western regions of US but not adjacent to Oregon border.
6 *Adjacent* – Weedy populations occur adjacent (<50 miles) to Oregon border.

Comments: Five known sites in Curry County, OR

4) 10 **Current Distribution**: What is the current distribution of escaped populations in Oregon?

0 *Not present* – Not known to occur in Oregon.
1 *Widespread* – Throughout much of Oregon (e.g., cheatgrass).
5 *Regional* – Abundant (i.e., occurs in eastern, western, central, coastal, areas of Oregon) (e.g., gorse, tansy ragwort).
10 *Limited* – Limited to one or a few infestations in state (e.g., kudzu).

Comments: Only five known sites, four of which are very small patches.

BIOLOGICAL INFORMATION

5) 2 **Environmental Factors**: Do abiotic (non-living) factors in the environment effect establishment and spread of the species? (e.g., precipitation, drought, temperature, nutrient availability, soil type, slope, aspect, soil moisture, standing or moving water).

1 *Low* – Severely confined by abiotic factors.
2 *Medium* – Moderately confined by environmental factors
4 *High* – Highly adapted to a variety of environmental conditions (e.g., tansy ragwort, Scotch broom).

Comments: Needs moisture year round to become established, can survive drought once established

6) 3 **Reproductive Traits:** How does this species reproduce? Traits that may allow rapid population increase both on and off site.

0 *Negligible* – Not self-fertile, or is dioecious and opposite sex not present.
1 *Low* – Reproduction is only by seed, produces few seeds, or seed viability and longevity are low.
3 *Medium* – Reproduction is vegetative (e.g., by root fragments, rhizomes, bulbs, stolons).
3 *Medium* – Produces many seeds, and/or seeds of short longevity (< 5 years).
5 *High* – Produces many seeds and/or seeds of moderate longevity (5-10 years) (e.g., tansy ragwort).
6 *Very high* – Has two or more reproductive traits (e.g., seeds are long-lived >10 years and spreads by rhizomes).

Comments: Can produce some viable seed (reports from CA), but primarily spreads via vegetative structures (stolons, rhizomes)

7) 4 **Biological Factors:** Do biotic (living) factors restrict or aid establishment and spread of the species? (What is the interaction of plant competition, natural enemies, native herbivores, pollinators, and pathogens with species?)

0 *Negligible* – Host plant not present for parasitic species.
1 *Low* – Biotic factors highly suppress reproduction or heavily damage plant for an extended period (e.g., biocontrol agent on tansy ragwort).
2 *Medium* – Biotic factors partially restrict or moderately impact growth and reproduction, impacts sporadic or short-lived.
4 *High* – Few biotic interactions restrict growth and reproduction. Species expresses full growth and reproductive potential.

Comments: No evidence indicating biotic factors limiting spread on the west coast.

8) 3 **Reproductive Potential and Spread After Establishment - Non-human Factors:** How well can the species spread by natural means?

0 *Negligible* – No potential for natural spread in Oregon (e.g., ornamental plants outside of climate zone).
1 *Low* – Low potential for local spread within a year, has moderate reproductive potential or some mobility of propagules (e.g., propagules transported locally by animals, water movement in lakes or ponds, not wind blown).
3 *Medium* - Moderate potential for natural spread with either high reproductive potential or highly mobile propagules (e.g., propagules spread by moving water, or dispersed over longer distances by animals) (e.g., perennial pepperweed).

5 *High* – Potential for rapid natural spread throughout the susceptible range, high reproductive capacity and highly mobile propagules. Seeds are wind dispersed over large areas (e.g., rush skeletonweed).

Comments: Can be moved in waterways during flood events, seeds can be wind blown via wispy pappus on achenes,

9) 3 **Potential of Species to be Spread by Humans**. What human activities contribute to spread of species? Examples include: interstate or international commerce; contaminated commodities; packing materials or products; vehicles, boats, or equipment movement; logging or farming; road maintenance; intentional introductions of ornamental and horticultural species, or biofuel production.

1 *Low* – Potential for introduction or movement minimal (e.g., species not traded or sold, or species not found in agricultural commodities, gravel or other commercial products).

3 *Medium* – Potential for introduction or off-site movement moderate (e.g., not widely propagated, not highly popular, with limited market potential; may be a localized contaminant of gravel, landscape products, or other commercial products) (e.g., lesser celandine, Canada thistle).

5 *High* – Potential to be introduced or moved within state high (e.g., species widely propagated and sold; propagules common contaminant of agricultural commodities or commercial products; high potential for movement by contaminated vehicles and equipment, or by recreational activities) (e.g., butterfly bush, spotted knapweed, Eurasian watermilfoil).

Comments: Movement via yard clippings already seen at one Curry County location. May be transplanted by gardeners for landscapes.

IMPACT INFORMATION

10) 5 **Economic Impact**: What impact does/can the species have on Oregon's agriculture and economy?

0 *Negligible* – Causes few, if any, economic impacts.

1 *Low* - Potential to, or causes low economic impact to agriculture; may impact urban areas (e.g., puncture vine, pokeweed).

5 *Medium* – Potential to, or causes moderate impacts to urban areas, right-of-way maintenance, property values, recreational activities, reduces rangeland productivity (e.g., English ivy, Himalayan blackberry, cheatgrass).

10 *High* – Potential to, or causes high impacts in agricultural, livestock, fisheries, or timber production by reducing yield, commodity value, or increasing production costs (e.g., gorse, rush skeleton weed, leafy spurge).

Comments: Similar impacts to that of English Ivy, which include additional right of way maintenance costs, forest regeneration costs, and control costs to public and private landowners. These impacts are most likely to occur in the coastal zones. Leaves are toxic to livestock, animals

11) 6 **Environmental Impact**: What risks or harm to the environment does this species pose? Plant may cause negative impacts on ecosystem function, structure, and biodiversity of plant or fish and wildlife habitat; may put desired species at risk.

0 *Negligible* – None of the above impacts probable.

1 *Low* – Can or does cause few or minor environmental impacts, or impacts occur in degraded or highly disturbed habitats.

4 *Medium* – Species can or does cause moderate impacts in less critical habitats (e.g., urban areas, sagebrush/ juniper stands).

6 *High* – Species can or does cause significant impacts in several of the above categories. Plant causes severe impacts to limited or priority habitats (e.g., aquatic, riparian zones, salt marsh; or T&E species sites).

Comments: Significant impacts to riparian and some inland habitats, alters entire canopy and understory diversity. Literature reports potential impacts to fish (toxic when soaks in waterways).

12) 1 **Impact on Health:** What is the impact of this species on human, animal, and livestock health? (e.g., poisonous if ingested, contact dermatitis, acute and chronic toxicity to livestock, toxic sap, injurious spines or prickles, causes allergy symptoms.

0 *Negligible* – Has no impact on human or animal health.
2 *Low* – May cause minor health problems of short duration, minor allergy symptoms (e.g., leafy spurge).
4 *Medium* – May cause severe allergy problems, death or severe health problems through chronic toxicity, spines or toxic sap may cause significant injury. (e.g., giant hogweed, tansy ragwort).
6 *High* – Causes death from ingestion of small amounts, acute toxicity (e.g. poison hemlock).

Comments: One report from CA indicating severe allergic reaction (heavy coughing, light-headed, blacked out and resulting in a seizure) while controlling and/or working in heavily infested areas. No impact to general population.

CONTROL INFORMATION

13) 5 **Probability of Detection at Point of Introduction**: How likely is detection of species after introduction and naturalization in Oregon?

1 *Low* – Grows where probability of early detection is high, showy and easily recognized by public; access to habitat not restricted (e.g., giant hogweed).
5 *Medium* – Easily identified by weed professionals, ranchers, botanists; some survey and detection infrastructure in place. General public may not recognize or report species (e.g., leafy spurge).
10 *High* – Probability of initial detection by weed professionals low. Plant shape and form obscure, not showy for much of growing season, introduction probable at remote locations with limited access (e.g., weedy grasses, hawkweeds, skeletonweed).

Comments: Would likely be considered just another vine (i.e.: English ivy) to general public. Knowledgeable individuals would recognize it as non-native.

14) 4 **Control Efficacy:** What level of control of this species can be expected with proper timing, herbicides, equipment, and biological control agents?

1 *Negligible* – Easily controlled by common non-chemical control measures (e.g., mowing, tillage, pulling, and cutting; biocontrol is very effective at reducing seed production and plant density) (e.g., tansy ragwort).
2 *Low* – Somewhat difficult to control, generally requires herbicide treatment (e.g., mechanical control measures effective at preventing flowering and but not reducing plant density; herbicide applications provide a high rate of control in a single application; biocontrol provides partial control).
4 *Medium* – Treatment options marginally effective or costly. Tillage and mowing increase plant density (e.g., causes tillering, rapid regrowth, spread from root fragments). Chemical control is marginally effective. Crop damage occurs or significant non-target impacts result from maximum control rates. Biocontrol agents ineffective.

6 *High* – No effective treatments known or control costs very expensive. Species may occur in large water bodies or river systems where containment and complete control are not achievable. Political or legal issues may prevent effective control.

Comments: Fragmentation, re-rooting of small pieces of stolons or rhizomes makes complete control difficult. Repeated mechanical methods and several herbicides shown to be effective.

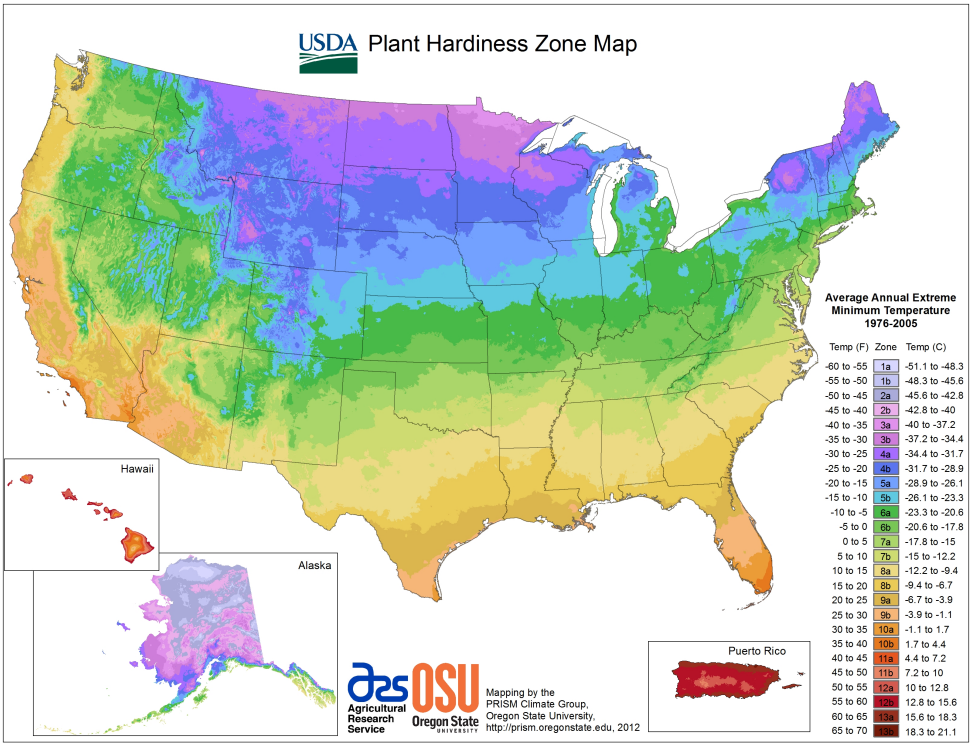
Category Scores:

22 Geographic score (Add scores 1-4)
12 Impact Score (Add lines 10-12)
15 Biological Score (Add lines 5-9)
9 Control Score (Add Lines 13-14)

58 Total Score (Add scores 1-14 and list on front of form)
Risk Category: 55-89 = A 24-54 = B < 24 = unlisted.

This Risk Assessment was modified by ODA from the USDA-APHIS Risk Assessment for the introduction of new plant species.
V3.8 2/19/2016

US Plant Hardiness Zone, *http://planthardiness.ars.usda.gov/PHZMWeb/*



Oregon Department of Agriculture
Noxious Weed Rating System

Common Name: Cape ivy
Scientific Name: *Delairea odorata*
Point Total: **19** Rating: **A**

1) Detrimental Effects: Check all that apply, add number of checks
- ☐ 1. *Health*: causes poisoning or injury to humans or animals
- ☐ 2. *Competition:* strongly competitive with crops, forage, or native flora
- ☒ 3. *Host*: host of pathogens and/or pests of crops or forage
- ☐ 4. *Contamination*: causes economic loss as a contaminate in seeds and/or feeds
- ☐ 5. *Interference*: interferes with recreation, transportation, harvest, land value, or wildlife and livestock movement

2) Reproduction & Capacity for Spread: Check the number that best describes, enter that number
- ☐ 1. Few seeds, not wind blown, spreads slowly
- ☐ 2. Many seeds, slow spread
- ☐ 3. Many seeds, spreads quickly by vehicles or animals
- ☒ 4. Windblown seed, or spreading rhizomes, or water borne
- ☐ 5. Many wind-blown seeds, high seed longevity, spreading rhizomes, perennials

3) Difficulty to Control: Check the number that best describes, enter that number
- ☐ 1. Easily controlled with tillage or by competitive plants
- ☐ 2. Requires moderate control, tillage, competition or herbicides
- ☒ 3. Herbicides generally required, or intensive management practices
- ☐ 4. Intensive management generally gives marginal control
- ☐ 5. No management works well, spreading out of control

4) Distribution: Check the number that best describes, enter that number
- ☐ 1. Widely distributed throughout the state in susceptible habitat
- ☐ 2. Regionally abundant, 5 or more counties, more than 1/2 of a county
- ☐ 3. Abundant throughout 1- 4 counties, or 1/4 of a county, or several watersheds
- ☐ 4. Contained in only 1 watershed, or less than 5 square miles gross infestation
- ☒ 5. Isolated infestation less than 640 acres, more than 10 acres

5) Ecological Impact: Check the number that best describes, enter that number
- ☐ 1. Occurs in most disturbed habitats with little competition
- ☐ 2. Occurs in disturbed habitats with competition
- ☐ 3. Invades undisturbed habitats and crowds out native species
- ☒ 4. Invades restricted habitats (i.e. riparian) and crowds out native species

19 TOTAL POINTS

Note: Noxious weeds are non-native plants with scores of 11 points or higher. Any plants in 4.1, 4.2, and 4.3 should not be classified as "A" rated weeds. Ratings: 16 + = A, 15 – 11= B
ODA Weed Rating System 2/22/16 V3.8

References:

Alvarez, M.E. 1997. Management of Cape Ivy (Delairea odorata) in the Golden Gate National Recreation Area. California Exotic Pest Plant Council (CalEPPC). Available: http://caleppc.org/symposia/97symposium/alvarez.html (Accessed: November 27, 2001).

Alvarez, M.E and J.H. Cushman. 2002. Community-Level Consequences of a Plant Invasion: Effects on Three Habitats in Coastal California. Ecological Applications 12(5) pp. 1434 - 1444.

Balciunas, J, E. Grobbelaar, R. Robison, and S. Neser. Distribution of Cape ivy (Delairea odorata), a growing threat to western riparian ecosystems. For publication in J. Aquatic Plant Management.

Bailey, L.H. and E.Z. Bailey. 1976. Hortus. 3rd ed. Macmillan General Reference, NY.
Bossard, C. and C. Benefield. 1996. War On German Ivy, Good News from the Front. Proceedings of the California Exotic Pest Plant Council Symposium 1997. pp. 63-64.

Bossard, C. 2000. Delairea odorata. In, Invasive Plants of Californiaâ€™s Wildlands. Eds., C. Bossard, J. Randall, and M. Hoshovsky. UC Press, Berkeley.

Brickell, C. and J.D. Zuk. 1997. The American Horticultural Society A-Z Encyclopedia of Garden Plants. DK Publishing, Inc., NY.

CalEPPC (California Exotic Pest Plant Council). 1994. German Ivy Engulfing Riparian Forests and Heading for the Uplands. CalEPPC News, winter edition, page 9.

CalIPC Plant Assessment, Delairea odorata, 2004. http://www.cal-ipc.org/ip/management/plant_profiles/Delairea_odorata.php

CalFlora: 2001. Information on California's Plants for Education, Research, and Conservation [web application]. Berkeley, California: The CalFlora Database [a non- profit organization]. Available: http://www.calflora.org/. (Accessed: November 27, 2001).

Cuddihy, L.W. and C.P. Stone. 1990. Alteration of Native Hawaiian Vegetation: Effects of Humans, Their Activities and Introductions. University of Hawai'i Press, Honolulu, HI.

DiTomaso, J.M. and E. Healy. 2007. Weeds of California and Other Western States, Volume 1. University of California ARS Publication 3488. Pages: 305-308.

DiTomaso, J.M. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and Information Center. University of California. Pages: 152-153.
Forbert, M. 1998. Some Tips on Herbicide Treatment of Cape Ivy (Delairea odorata). CalEPPC News, vol. 6, number 2.

Haley, N. 1997. Weeds in New Zealand. Department of Conservation, New Zealand. Available: http://www.boprc.govt.nz//www/green/weedcopy.htm (Accessed: November 27, 2001).

Haselwood, E.L. and G.G. Motter, eds. 1983. Handbook of Hawaiian Weeds. 2nd ed. revised and expanded by R.T. Hirano. Harold L. Lyon Arboretum, University of Hawai'i, Honolulu, HI.

Herbst, D.R. and W.L. Wagner. 1999. Contributions to the Flora of Hawai'i. VII. Bishop Mus. Occas. Pap. 58 (1): 12-36.

Jacobi, J.D. and F. R. Warshauer. 1992. Distribution of Six Alien Plant Species in Upland Habitats on the Island of Hawai'i. In: Alien Plant Invasions in Native Ecosystems of Hawai'i: Management and Research. C.P. Stone, C.W. Smith, and J.T. Tunison, eds. University of Hawai'i Cooperative National Park Resources Studies Unit, University of Hawai'i Press, Honolulu, HI.

Maui Invasive Species Council (MISC) Blog Post, Posted on July 22, 2014. What's the New Black Caterpillar?

Neal, M.C. 1965. In Gardens of Hawai'i. Bernice P. Bishop Museum, Special Publication 40, Honolulu, HI.

Nelson, D. 1999. Cape Ivy, Another Problem Plant for the Ventana Wilderness. The Double Cone Quarterly, Vol. 2, number 1. Available: http://www.ventanawild.org/- news/se99/capeivy.html. (Accessed: November 27, 2001).

NSW Agriculture. 1993. Noxious Weeds in NSW, Australia. Available: http://www.agric.nsw.gov.au/noxweed/. (Accessed November 27, 2001).

PLANTS (National Plants Database). 2001. Online database. United States Department of Agriculture, Natural Resources Conservation Services, National Plant Data Center, Baton Rouge, LA. Available: http://plants.usda.gov (Accessed: October 31, 2001).

Robison, R. (2000) Distribution, Reproductive Dynamics and Physiology of Cape ivy (Delairea odorata syn Senecio mikanioides), an Invasive Wildland Weed of the Pacific Coast.

Starr, Forrest, Kim Starr, and Lloyd Loope. 2003. Delairea odorata, Cape ivy. United States Geological Survey--Biological Resources Division Haleakala Field Station, Maui, Hawai'i.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1999. Manual of the Flowering Plants of Hawai'i. 2 vols. Bishop Museum Special Publication 83, University of Hawai'i and Bishop Museum Press, Honolulu, HI.

Wing, J. 2000. Animals, Plants, and the Environment. SunSITE, Southern Africa. Available: sunsite.wits.ac.za/ape/ivy.htm (Accessed: November 27, 2001).

Reported by: Carri Pirosko, ODA