

**INTERNATIONAL ECOLOGICAL
CLASSIFICATION STANDARD:**

TERRESTRIAL ECOLOGICAL CLASSIFICATIONS

**Ruderal NVC Groups of the U.S.-
CONUS, Hawai'i and Caribbean**

28 November 2017

by

NatureServe

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This subset of the International Ecological Classification Standard includes Ruderal Groups occurring in the U.S. This classification has been developed in consultation with many individuals and agencies and incorporates information from a variety of publications and other classifications. Comments and suggestions regarding the contents of this subset should be directed to Mary J. Russo, Central Ecology Data Manager, NC <mary_russo@natureserve.org> and Marion Reid, Senior Regional Ecologist, Boulder, CO <marion_reid@natureserve.org>.



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Canada

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1.A.1.Ea. Caribbean-Mesoamerican Dry Forest & Woodland (D099)

M514. Caribbean Ruderal Dry Forest

1. Forest & Woodland

1.A.1.Ea. Caribbean-Mesoamerican Dry Forest & Woodland

G683. Caribbean Ruderal Dry Forest

Type Concept Sentence: Caribbean ruderal dry forests occur on rapidly drained soils commonly on dry leeward areas and in some areas of higher rainfall on islands of the Greater Antilles, most commonly on former agricultural or grazing land, now dominated by trees.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.A.1.Ea.90. Caribbean Ruderal Dry Forest (M514)

Elcode: G683

***Scientific Name:** Caribbean Ruderal Dry Forest Group

***Common (Translated Scientific) Name:** Caribbean Ruderal Dry Forest Group

***Colloquial Name:** Caribbean Ruderal Dry Forest

***Type Concept:** These ruderal dry forests occur on the leeward areas of islands of the Greater Antilles, and on rapidly drained soils in some areas of higher rainfall. In the Lesser Antilles, where orthographic factors have little influence on rainfall patterns, it occurs in a wide variety of sites. These ruderal dry forests occur most commonly on former agricultural or grazing land, now dominated by trees.

***Diagnostic Characteristics:**

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Dominated by dry deciduous trees and shrubs, especially the common naturalized legumes *Leucaena leucocephala* and *Prosopis juliflora* (Colón et al. 2011). Trees tend to be very dense and small, and forests tend to be strongly dominated by one or a few tree species.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Dominant and common trees and shrubs include *Vachellia farnesiana* (= *Acacia farnesiana*), *Acacia macracantha*, *Acacia muricata*, *Amyris elemifera*, *Capparis cynophallophora*, *Eugenia cordata*, *Leucaena leucocephala*, *Melicoccus bijugatus*, *Myrciaria floribunda*, *Pisonia subcordata*, and *Prosopis pallida* (Brandeis et al. 2009b, Colón et al. 2011). *Leucaena leucocephala* is considered native to Puerto Rico in Brandeis et al. (2009b), but considered in Acevedo-Rodríguez and Strong (2012) to be introduced.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Ruderal dry forests closer to large natural native forests (such as the Guánica Forest Biosphere Reserve, in Puerto Rico) have higher native tree species diversity, and are more floristically similar to natural native forests, than ruderal dry forests surrounded by farmland farther away from large natural native forests (Colón et al. 2011). Forest fragmentation has been very high, so many examples of ruderal dry forest are far from large native dry forests, but even small native forest fragments can serve as dispersal sources for native trees, and provide habitat for bird and bat species which disperse tree seeds (Colón et al. 2011).

ENVIRONMENT

Environmental Description: Occurs in leeward areas on islands of the Greater Antilles, and on rapidly drained soils in some areas of higher rainfall. In the Lesser Antilles, where orthographic factors have little influence on rainfall patterns, it occurs in a wide variety of sites. Ruderal forests mainly occur on sites which were formerly used for agriculture, agroforestry or grazing (Lugo and Helmer 2004, Colón et al. 2011, Lugo 2013). Ruderal forests have higher soil bulk densities due to past soil compaction. Also there is much less leaf litter and soil organic matter than in mature native forests, but soil organic matter increases in ruderal forests over time following abandonment of agriculture or grazing (Weaver et al. 1987, Lugo and Helmer 2004).

DISTRIBUTION

***Geographic Range:** This group is found in the Greater Antilles, Lesser Antilles, Bahamas, and southern Florida.

Nations: BS, CU, DO, JM, KN, PR, US, VI, XC, XD

States/Provinces: FL

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	III.B.1.N.a. <i>Leucaena leucocephala</i> Shrubland Alliance	Areces-Mallea et al. 1999	
<	III.B.1.N.a. <i>Acacia macracantha</i> - <i>Acacia farnesiana</i> Shrubland Alliance	Areces-Mallea et al. 1999	
<	Mesquite Savana -- 72.3	Dansereau 1966	
<	Leucaena Thicket -- 23.4	Dansereau 1966	
<	Leucaena Woodland -- 23.2	Dansereau 1966	
<	ProPal	Brandeis et al. 2009b	

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	LeuLeu	Brandeis et al. 2009b	
<	AcaMur/PisSub	Brandeis et al. 2009b	
<	AcaFar	Brandeis et al. 2009b	
><	II.B.1.N.a. <i>Prosopis pallida</i> -(<i>Bucida buceras</i>) Woodland Alliance	Areces-Mallea et al. 1999	
=	Novel dry forests	Colón et al. 2011	

AUTHORSHIP

***Primary Concept Source [if applicable]:** T.J. Brandeis, E. Helmer, H. Marciano Vega, and A.E. Lugo (2009b)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** C.W. Nordman

Acknowledgments [optional]:

Version Date: 11 Oct 2016

REFERENCES

***References [Required if used in text]:**

- Acevedo-Rodríguez, P., and M. T. Strong. 2012. Catalogue of seed plants of the West Indies. Smithsonian Contributions to Botany 98:1-1192.
- Areces-Mallea, A. E., A. S. Weakley, X. Li, R. G. Sayre, J. D. Parrish, C. V. Tipton, and T. Boucher. 1999. A guide to Caribbean vegetation types: Preliminary classification system and descriptions. The Nature Conservancy, Arlington, VA. 166 pp.
- Brandeis, T. J., E. H. Helmer, H. Marciano-Vega, and A. E. Lugo. 2009b. Climate shapes the novel plant communities that form after deforestation in Puerto Rico and the US Virgin Islands. *Forest Ecology and Management* 258(7):1704-1718.
- Colón, S. M., A. E. Lugo, and O. M. R. González. 2011. Novel dry forests in southwestern Puerto Rico. *Forest Ecology and Management* 262:170-177.
- Dansereau, P. 1966. Studies on the vegetation of Puerto Rico. Part I. Description and integration of the plant-communities. University of Puerto Rico, Institute of Caribbean Sciences. Special Publication No. 1. Mayagüez, Puerto Rico. 287 pp.
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- Lugo, A. E. 2013. Novel tropical forests: Nature's response to global change. *Tropical Conservation Science*. Special Issue 6(3):325-337. [www.tropicalconservationscience.org]
- Lugo, A. E., and E. Helmer. 2004. Emerging forests on abandoned land: Puerto Rico's new forests. *Forest Ecology and Management* 190:145-161.
- Weaver, P. L., R. A. Birdsey, and A. E. Lugo. 1987. Soil organic matter in secondary forests of Puerto Rico. *Biotropica* 19:17-23.

1.A.2.Eg. Caribbean-Mesoamerican Lowland Humid Forest (D091)

M281. Caribbean Lowland Humid Forest

1. Forest & Woodland

1.A.2.Eg. Caribbean-Mesoamerican Lowland Humid Forest

G845. Caribbean Lowland Ruderal Rainforest

Type Concept Sentence: This is a widespread broad-leaved ruderal forest which occurs in moist lowland areas on islands of the Caribbean, on sites which were mostly cultivated or used for pasture in the past.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.A.2.Eg.1. Caribbean Lowland Humid Forest (M281)

Elcode: G845

***Scientific Name:** Caribbean Lowland Ruderal Rainforest Group

***Common (Translated Scientific) Name:** Caribbean Lowland Ruderal Rainforest Group

***Colloquial Name:** Caribbean Lowland Ruderal Rainforest

***Type Concept:** This is a widespread broad-leaved ruderal forest which occurs in moist lowland areas on islands of the Caribbean. These sites were mostly cultivated or used for pasture in the past, from the colonial period to the middle of the 20th century. After abandonment of agriculture and grazing, forests of native and exotic trees reestablished on these sites. Over time, more native trees regenerate on many of the sites.

***Diagnostic Characteristics:** This is a widespread ruderal forest which occurs in moist lowland areas on islands of the Caribbean.

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Evergreen or semi-deciduous forest.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Dominant trees and shrubs include *Casearia arborea*, *Cecropia schreberiana*, *Citrus x sinensis*, *Guarea guidonia*, *Inga vera*, *Mangifera indica*, *Spathodea campanulata*, *Syzygium jambos*, and *Tabebuia heterophylla*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Native shade-tolerant tree species regenerate in ruderal forests which have the canopy dominated by *Spathodea campanulata*. Many of these native tree species do not regenerate on newly abandoned agricultural or grazing land in Puerto Rico. Natural processes have the potential of making these ruderal forests more diverse (Abelleira Martínez et al. 2010). Because *Spathodea campanulata* tolerates flooding, its dominance may persist longer on alluvial sites than upland sites (Abelleira Martínez et al. 2010). Alluvial forests were mostly cleared for sugar cane cultivation, then abandoned during the middle of the 20th century, allowing ruderal forests to establish. *Syzygium jambos* has invaded riparian areas and old-growth forest stands and appears to inhibit the regeneration of native forest species. To recover native forest in areas that are dominated by *Syzygium jambos*, it will be necessary to reduce the abundance of this species (Aide et al. 2000). *Tabebuia heterophylla* has been extensively planted on the more humid public forest lands in Puerto Rico due to its adaptability to replenish soils degraded by farming. It is widespread in forests, abandoned pastures, secondary forests, forest plantations, and along roadsides and city streets throughout Puerto Rico with the exception of the upper Luquillo and upper Cordillera forest regions (Little and Wadsworth 1964).

ENVIRONMENT

Environmental Description: In moist lowland areas, ruderal forests mainly occur on sites which were formerly used for agriculture, agroforestry or grazing. Included here are upland and alluvial sites which were cultivated in the past. Ruderal forests have higher soil bulk densities due to past soil compaction. Also there is much less leaf litter and soil organic matter than in mature native forests, but soil organic matter increases in ruderal forests over time following abandonment of agriculture or grazing (Weaver et al. 1987, Lugo and Helmer 2004).

DISTRIBUTION

***Geographic Range:** This group occurs on moist lowland sites on islands of the Caribbean.

Nations: CU, DO, JM, PR, VI

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

*Plot Analysis Summary [Med - High Confidence]:

*Plots Used to Define the Type [Med - High Confidence]:

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	I.A.1.N.b. <i>Terminalia catappa</i> Forest Alliance	Areces-Mallea et al. 1999	
<	Roble Prieto Scrub - 63.4	Dansereau 1966	
<	Second-growth Savana - 48.3	Dansereau 1966	
<	Second-growth Woodland -- 48.2	Dansereau 1966	
<	TabHet/CasArb	Brandeis et al. 2009b	
<	CitFru/ExoCar	Brandeis et al. 2009b	
<	SpaCam	Brandeis et al. 2009b	
>>	I.A.1.N.b. <i>Mangifera indica</i> Forest Alliance	Areces-Mallea et al. 1999	
>>	I.A.1.N.b. <i>Syzygium jambos</i> Forest Alliance	Areces-Mallea et al. 1999	
>>	Trumpet-wood Forest - 43.1	Dansereau 1966	
>>	GuaGui/DenArb	Brandeis et al. 2009b	
>>	CecSch/CitSin	Brandeis et al. 2009b	
>>	SyzJam	Brandeis et al. 2009b	

AUTHORSHIP

*Primary Concept Source [if applicable]: T.J. Brandeis, E. Helmer, H. Marcano Vega, and A.E. Lugo (2009b)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: C.W. Nordman

Acknowledgments [optional]:

Version Date: 11 Oct 2016

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1.A.2.Oa. Polynesian Lowland Humid Forest (D066)**M190. Polynesian Ruderal Lowland Rainforest**

1. Forest & Woodland

1.A.2.Oa. Polynesian Lowland Humid Forest

G390. Polynesian Ruderal Lowland Rainforest

Type Concept Sentence: This Polynesian lowland ruderal group contains all mesic and wet forests and woodlands that are strongly dominated (>90% relative canopy cover) by non-native trees in the tree canopy such as *Acacia confusa*, *Araucaria columnaris*, *Casuarina* spp. (coastal areas), *Coffea arabica*, *Grevillea robusta*, *Mangifera indica*, *Morella faya*, *Phyllostachys nigra*, *Phoenix dactylifera*, *Psidium cattleianum*, *Psidium guajava*, *Schefflera actinophylla*, *Schinus terebinthifolius*, *Syzygium cumini*, *Syzygium jambos*, *Thespesia populnea* (common along coasts), and native tree canopy dominated or codominated by *Acacia koa* with exotic ruderal understory.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.A.2.Oa.90. Polynesian Ruderal Lowland Rainforest (M190)

Elcode: G390

***Scientific Name:** *Psidium* spp. - *Syzygium jambos* - *Grevillea robusta* Ruderal Lowland Rainforest Group

***Common (Translated Scientific) Name:** Guava species - Malabar Plum - Silk-oak Ruderal Lowland Rainforest Group

***Colloquial Name:** Polynesian Ruderal Lowland Rainforest

***Type Concept:** This Polynesian lowland ruderal group contains all mesic and wet forests and woodlands that are strongly dominated (>90% relative canopy cover) by non-native trees in the tree canopy. Numerous species may dominate these disturbed stands, including *Acacia confusa*, *Araucaria columnaris*, *Casuarina* spp. (coastal areas), *Coffea arabica*, *Eucalyptus* spp., *Grevillea robusta*, *Mangifera indica*, *Morella faya*, *Phyllostachys nigra*, *Phoenix dactylifera*, *Psidium cattleianum*, *Psidium guajava*, *Schefflera actinophylla*, *Schinus terebinthifolius*, *Syzygium cumini*, *Syzygium jambos*, *Thespesia populnea* (common along coasts), and *Trema orientale*. Also included are stands with a tree canopy dominated or codominated native species, such as *Acacia koa* or *Metrosideros polymorpha*, with a severely degraded understory that is altered beyond the point that the natural plant community can be determined, and the community has converted to a ruderal or novel type (usually dominated by non-native species with >90% relative cover). There are numerous, invasive, exotic understory species, especially trees *Psidium cattleianum* and *Morella faya*, and herbaceous species *Ageratum conyzoides*, *Andropogon virginicus*, *Axonopus fissifolius*, *Melinis minutiflora*, *Paspalum conjugatum*, *Sacciolepis indica*, and *Sphagneticola trilobata*. Stands in this group occur in Hawai'i, Moloka'i, Maui, Kaua'i and O'ahu, and elsewhere in Polynesia. Sites occur along the coasts inland from 5 to 1500 m (15-4920 feet) elevation, but are generally found below

1000 m (3280 feet). Coastal forests also occur on windward sides where they intercept sufficient orographic rainfall to maintain a forest condition, yet may be influenced by coastal factors such as salt spray. The mesic forests have relatively even, moderate precipitation throughout the year or have a distinct, seasonally dry period and typically do not experience extended periods of drought like the dry forests and woodlands. Annual rainfall is 1200-2500 mm (47-98 inches) and falls largely from October to March. Rainforests are typically wet year round. Annual rainfall generally exceeds 2500 mm (98 inches). Substrates are highly variable but are generally well-drained and include steep, rocky talus, shallow to deep soils over weathered rock and gravelly alluvium, rocky shallow organic muck.

***Diagnostic Characteristics:**

***Classification Comments:** This ruderal group includes stands dominated by tree species that were introduced by Polynesians such as *Aleurites moluccanus*, *Morinda citrifolia*, *Syzygium malaccense*, and *Thespesia populnea*, recently (post-European contact) escaped ornamental and fruit trees *Psidium* spp., *Melaleuca quinquenervia*, and *Morella faya*, and non-native timber species that are invasive and naturalize in areas outside plantations. Although plantations may share some common timber species, the ruderal stands have often a multi-aged, mixed-species tree canopy rather than even-aged, near-monoculture of timber trees with clear stand plantation boundaries. Exotic timber species may include *Acacia auriculiformis*, *Acacia confusa*, *Acacia mangium*, *Acacia mearnsii*, *Acacia melanoxylon*, *Albizia chinensis*, *Albizia lebeck*, *Casuarina cunninghamiana*, *Eucalyptus globulus*, *Eucalyptus grandis*, *Eucalyptus saligna*, *Falcataria moluccana* (= *Albizia moluccana*), *Grevillea robusta*, *Pithecellobium dulce*, and *Toona ciliata* and are generally treated as ruderal, unless found in plantations.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This ruderal Polynesian group contains all mesic and wet forests and woodlands that are strongly dominated (>90% relative canopy cover) by non-native trees in the tree canopy such as *Acacia confusa*, *Araucaria columnaris*, *Casuarina* spp. (coastal areas), *Coffea arabica*, *Eucalyptus* spp., *Grevillea banksii*, *Grevillea robusta*, *Mangifera indica*, *Morella faya*, *Phyllostachys nigra*, *Phoenix dactylifera*, *Psidium cattleianum*, *Psidium guajava*, *Schefflera actinophylla*, *Schinus terebinthifolius*, *Syzygium cumini*, *Syzygium jambos*, *Thespesia populnea* (common along coasts), and *Trema orientale*. Also included are stands with a tree canopy dominated or codominated native species, such as *Acacia koa* or *Metrosideros polymorpha*, with a severely degraded understory that is altered beyond the point that the natural plant community can be determined, and the community has converted to a ruderal or novel type (usually dominated by non-native species with >90% relative cover). There are numerous, exotic understory species, including the especially invasive trees *Psidium cattleianum* and *Morella faya*, shrubs *Caesalpinia decapetala*, *Lantana camara*, and *Triumfetta rhomboidea*, and herbaceous species *Ageratum conyzoides*, *Andropogon virginicus*, *Axonopus fissifolius*, *Cynodon dactylon*, *Melinis minutiflora*, *Paspalum conjugatum*, *Sacciolepis indica*, and *Sphagneticola trilobata*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description: This lowland ruderal Polynesian forest and woodland group is found in mesic to wet areas of Hawai'i, Moloka'i, Maui, Kaua'i and O'ahu. Stands occur along the coasts inland from 5 to 1500 m (15-4920 feet) elevation, but are generally found below 1000 m (3280 feet). Coastal forests also occur on windward sides where they intercept sufficient orographic rainfall to maintain a forest condition, yet may be influenced by coastal factors such as salt spray.

Climate: The tropical climate ranges from mesic to wet. Moisture zones are seasonally mesic and moist mesic (Zones 4 and 5) on sites between the dry leeward and wet windward, and moderately wet to very wet windward sites (Zones 6 and 7) of the 7 Moisture Zones developed for the Hawaiian Islands by Price et al. (2007). The mesic forests have relatively even, moderate precipitation throughout the year or have a distinct, seasonally dry period and typically do not experience extended periods of drought like the dry forests and woodlands. Annual rainfall is 1200-2500 mm (47-98 inches) and falls largely from October to March. Annual rainfall in rainforests generally exceeds 2500 mm (98 inches).

Soil/substrate/hydrology: Substrates are highly variable ranging from gray acidic clays on older islands to thin organic mucks over lava flows and ash beds on Hawai'i. Soils are generally well-drained and include steep, rocky talus, shallow to deep soils over weathered rock and gravelly alluvium, rocky shallow organic muck.

DISTRIBUTION

***Geographic Range:** This lowland ruderal forest and woodland group is found in mesic to wet areas of Hawai'i, Moloka'i, Maui, Kaua'i and O'ahu.

Nations: US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
><	Lowland Mesic Forest	Gagne and Cuddihy 1990	

AUTHORSHIP

***Primary Concept Source [if applicable]:** K.A. Schulz, in Faber-Langendoen et al. (2016)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** K.A. Schulz

Acknowledgments [optional]:

Version Date: 26 May 2016

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1.A.3.Eg. Caribbean-Mesoamerican Montane Humid Forest (D228)**M598. Caribbean Montane Humid Forest**

1. Forest & Woodland

1.A.3.Eg. Caribbean-Mesoamerican Montane Humid Forest

G846. Caribbean Montane Ruderal Forest

Type Concept Sentence: These Caribbean ruderal forests are dominated by *Syzygium jambos*, *Guarea guidonia*, *Prestoea acuminata* var. *montana*, and other pioneer or secondary forest trees. They occur in high rainfall montane and submontane areas which were landslides or were formerly used for coffee production, other agriculture, agroforestry, or grazing.

OVERVIEW

Hierarchy Level:** GroupPlacement in Hierarchy:** 1.A.3.Eg.1. Caribbean Montane Humid Forest (M598)

Elcode: G846

Scientific Name:** Caribbean Montane Ruderal Forest GroupCommon (Translated Scientific) Name:** Caribbean Montane Ruderal Forest Group***Colloquial Name:** Caribbean Montane Ruderal Forest

***Type Concept:** This ruderal forest occurs in high rainfall montane and submontane areas on islands in the Caribbean. Montane ruderal forests mainly occur on sites which were formerly used for coffee production, other agriculture, agroforestry, or grazing. Some ruderal forests occur on montane landslide areas. Stands are dominated by native and exotic pioneer or secondary forest trees. The native palm *Prestoea acuminata* var. *montana* is a dominant tree species in areas formerly small clearings and in small regenerating patches of mature forest, especially on slopes. *Guarea guidonia* is a native tree species that was maintained for coffee shade; it has the ability to successfully regenerate in abandoned coffee shade and out-compete other species, and it has become very common. *Syzygium jambos* is an exotic tree which occurs in montane forests of Puerto Rico, especially in riparian areas. It appears to inhibit the regeneration of native forest species.

Diagnostic Characteristics:**Classification Comments:*****Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:**Physiognomy and Structure Table [optional]:**

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: *Syzygium jambos* is an exotic tree which occurs in montane forests of Puerto Rico, especially in riparian areas, but it is spreading into other montane sites. In the Luquillo Mountains of northeastern Puerto Rico, *Syzygium jambos* does not appear to be limited by topographic, soil nutrient, or elevational conditions (Brown et al. 2006). *Guarea guidonia*, *Dendropanax arboreus*, *Coffea arabica*, *Inga vera*, and *Mangifera indica* occur in areas which were formerly in coffee production (Aide et al. 2000). The native palm *Prestoea acuminata* var. *montana* is a dominant tree species in areas formerly small clearings and in small regenerating patches of mature forest, especially on slopes. Other common trees include the secondary forest species *Casearia arborea*, *Casearia sylvestris*, *Psidium guajava*, *Inga laurina*, *Tabebuia heterophylla*, *Alchornea latifolia*, and the pioneer or secondary forest species *Cecropia schreberiana*, *Citrus x sinensis*, *Ochroma pyramidale*, and *Schefflera morototoni* (Brandeis et al. 2009b, Comita et al. 2010).

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Hurricane disturbance tends to promote secondary forest tree species, both on sites with a history of high-intensity land use (agriculture, agroforestry or grazing), and on sites with more natural forest (Comita et al. 2010). In montane areas *Coffea arabica* was commonly grown with both native and exotic shade trees. Since the 1970s *Coffea arabica* production has declined and former *Coffea arabica* plantations with shade trees have become ruderal forests, dominated by the shade trees.

Guarea guidonia is a native tree species that was maintained for coffee shade along with native *Inga laurina*, *Inga vera*, and *Erythrina poeppigiana*. *Guarea guidonia* has increased in importance to become the second most important tree species in Puerto Rico; it has the ability to successfully regenerate in abandoned coffee shade and out-compete other species (Birdsey and Weaver 1982, Pascarella et al. 2000, Brandeis et al. 2007). *Guarea guidonia* is a native tree species which has responded to the regeneration opportunities provided by human forest management and disturbance that might have otherwise been taken by introduced species (Brandeis et al. 2009b). The importance of *Guarea guidonia* is a possible indication of how much the forests of Puerto Rico have been modified by former land uses, such as coffee cultivation (Brandeis et al. 2009b). *Syzygium jambos* has invaded riparian areas and old-growth forest stands and appears to inhibit the regeneration of native forest species. To recover native forest in areas that are dominated by *Syzygium jambos*, it will be necessary to reduce the abundance of this species (Aide et al. 2000).

ENVIRONMENT

Environmental Description: This ruderal forest occurs in high rainfall montane and submontane areas on islands in the Caribbean. Some ruderal forests occur on montane landslide areas. Ruderal forests mainly occur on sites which were formerly used for coffee production, other agriculture, agroforestry, or grazing. Ruderal forests have higher soil bulk densities due to past soil compaction. Also there is much less leaf litter and soil organic matter than in mature native forests, but soil organic matter increases in ruderal forests over time following abandonment of agriculture or grazing (Weaver et al. 1987, Lugo and Helmer 2004).

DISTRIBUTION

***Geographic Range:** This group occurs on Caribbean islands with mountains above 600-700 m elevation and on different geologies and substrates, including Cuba, Dominican Republic, Jamaica, Puerto Rico and mountainous islands of the Lesser Antilles.

Nations: CU, DO, JM, PR, XD

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	I.C.1.N.b. <i>Inga vera</i> - <i>Erythrina poeppigiana</i> Forest Alliance	Areces-Mallea et al. 1999	
<	Rose-apple Thicket -- 76.4	Dansereau 1966	
<	Inga-coffee Forest - 75.1	Dansereau 1966	
<	CasSyl/PsiGua	Brandeis et al. 2009b	
<	I.A.1.N.b. <i>Cecropia peltata</i> - <i>Ochroma pyramidale</i> Forest Alliance	Areces-Mallea et al. 1999	
>>	I.A.1.N.b. <i>Mangifera indica</i> Forest Alliance	Areces-Mallea et al. 1999	
>>	I.A.1.N.b. <i>Syzygium jambos</i> Forest Alliance	Areces-Mallea et al. 1999	
>>	Sierra-palm Forest - 88.1b	Dansereau 1966	
>>	Trumpet-wood Forest - 43.1	Dansereau 1966	
>>	SyzJam	Brandeis et al. 2009b	
>>	GuaGui/DenArb	Brandeis et al. 2009b	
>>	CecSch/CitSin	Brandeis et al. 2009b	

AUTHORSHIP

*Primary Concept Source [if applicable]: T.J. Brandeis, E. Helmer, H. Marcano Vega, and A.E. Lugo (2009b)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: C.W. Nordman

Acknowledgments [optional]:

Version Date: 11 Oct 2016

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*References [Required if used in text]:

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1.A.3.Oa. Polynesian Montane & Cloud Forest (D068)

M197. Polynesian Ruderal Montane Rainforest

1. Forest & Woodland

1.A.3.Oa. Polynesian Montane & Cloud Forest

G626. Hawaiian Montane Ruderal Forest & Woodland

Type Concept Sentence: This montane to subalpine, mesic and wet forest and woodland ruderal group has a mostly native tree canopy with the understory converted to invasive species *Andropogon virginicus*, *Microlaena stipoides*, *Melinis minutiflora*, *Nephrolepis multiflora*, and *Pennisetum clandestinum*. *Morella faya* may also be present to dominant in the tree canopy, but invasive exotics are less common at higher elevations.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.A.3.Oa.90. Polynesian Ruderal Montane Rainforest (M197)

Elcode: G626

***Scientific Name:** *Morella faya* - *Metrosideros polymorpha* / Non-native Understory Montane Mesic & Wet Ruderal Forest & Woodland Group

***Common (Translated Scientific) Name:** Firetree - `Ohi`a / Non-native Understory Montane Mesic & Wet Ruderal Forest & Woodland Group

***Colloquial Name:** Hawaiian Montane Ruderal Forest & Woodland

***Type Concept:** This montane to subalpine, mesic and wet forest and woodland ruderal group occurs only on the larger, main Hawaiian Islands. It typically has a largely native tree canopy that is frequently dominated or codominated by *Acacia koa* or *Metrosideros polymorpha* with a severely degraded understory converted to invasive species such as *Andropogon virginicus*, *Microlaena stipoides* (= *Ehrharta stipoides*), *Melinis minutiflora*, *Nephrolepis multiflora*, and *Pennisetum clandestinum*. This severely degraded understory is altered to the point that the natural plant community cannot be determined, and the community has converted to a ruderal or novel type (usually dominated by non-native species with >90% relative cover). Native shrubs are typically sparse or absent. Exotic trees are less common at higher elevations, but invasive *Morella faya* may be present to dominant in the tree canopy.

***Diagnostic Characteristics:**

***Classification Comments:** Most stands have a native-dominated or -codominated tree canopy with understory converted to invasive *Andropogon virginicus*, *Microlaena stipoides*, *Melinis minutiflora*, *Nephrolepis multiflora*, *Pennisetum clandestinum*, and numerous other exotic species. Native shrub layers are typically absent. The group concept for this ruderal type includes stands with exotic-dominated tree canopies, but these are less common in the montane and subalpine zones.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G407	Polynesian Ruderal Dry Woodland & Scrub	

Similar NVC Types General Comments [optional]:**VEGETATION****Physiognomy and Structure Summary:****Physiognomy and Structure Table [optional]:**

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This ruderal forest and woodland group occurs only on the larger, main Hawaiian Islands. The tree canopy is typically mostly native and is frequently dominated or codominated by *Acacia koa* or *Metrosideros polymorpha* with a severely degraded understory converted to invasive species such as *Andropogon virginicus*, *Microlaena stipoides* (= *Ehrharta stipoides*), *Melinis minutiflora*, *Nephrolepis multiflora*, and *Pennisetum clandestinum*. Native shrubs are typically sparse or absent and do not characterize the understory. This severely degraded understory is altered beyond the point that the natural plant community can be determined, and the community has converted to a ruderal or novel type (usually dominated by non-native species with >90% relative cover). Exotic trees are less common at higher elevations, but invasive *Morella faya* and other exotic trees may be present to dominant in the tree canopy.

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:**ENVIRONMENT**

Environmental Description: Stands in this group occur in Hawai'i, Moloka'i, Maui, Kaua'i and O'ahu, and elsewhere in Polynesia. Sites occur from 900-2200 m (2950-7000 feet) elevation.

Climate: The tropical climate ranges from mesic to wet. Moisture zones are seasonally mesic and moist mesic (Zones 4 and 5) on sites between the dry leeward and wet windward, and moderately wet to very wet windward sites (Zones 6 and 7) of the 7 Moisture Zones developed for the Hawaiian Islands by Price et al. (2007). The mesic forests have relatively even, moderate precipitation throughout the year or have a distinct, seasonally dry period and typically do not experience extended periods of drought like the dry forests and woodlands. Annual rainfall is 1200-2500 mm (47-98 inches) and falls largely from October to March. Annual rainfall in rainforests generally exceeds 2500 mm (98 inches).

Soil/substrate/hydrology: Substrates are variable. Wet soils generally have a gley horizon 10 to 70 cm (4-28 inches) deep, underlain by lateritic weathered basalt and overlain with organic hummus ranging from 10 to 30 cm (4-12 inches) deep that are nutrient-poor and lateritic due to leaching. Substrates include deep volcanic ash soils and trachyte, rocky mucks, and silty loams derived from weathered `a`a lava (Gagne and Cuddihy 1990).

DISTRIBUTION

***Geographic Range:** This montane-subalpine ruderal forest and woodland group occurs in the larger Hawaiian Islands such as Hawai'i, Moloka'i, Maui, Kaua'i and O'ahu.

Nations: US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: K.A. Schulz, in Faber-Langendoen et al. (2016)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: K.A. Schulz

Acknowledgments [optional]:

Version Date: 26 May 2016

REFERENCES

*References [Required if used in text]:

- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Gagne, W. C., and L. W. Cuddihy. 1990. Vegetation. Pages 45-114 in: W. L. Wagner, D. R. Herbst, and S. H. Sohmer, editors. Manual of the Flowering Plants of Hawaii. 2 volumes. University of Hawaii Press, Honolulu.
- Price, J. P., S. M. Gon, III, J. D. Jacobi, and D. Matsuwaki. 2007. Mapping plant species ranges in the Hawaiian Islands: Developing a methodology and associated GIS layers. Hawai'i Cooperative Studies Unit. Technical Report HCSU-008. Pacific Aquaculture and Coastal Resources Center (PACRC), University of Hawai'i, Hilo. 58 pp., includes 16 figures and 6 tables.

1. Forest & Woodland

1.A.3.Oa. Polynesian Montane & Cloud Forest

G395. Polynesian Ruderal Montane-Subalpine Rainforest

Type Concept Sentence:

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 1.A.3.Oa.90. Polynesian Ruderal Montane Rainforest (M197)

Elcode: G395

*Scientific Name: Polynesian Ruderal Montane-Subalpine Rainforest Group

*Common (Translated Scientific) Name: Polynesian Ruderal Montane-Subalpine Rainforest Group

*Colloquial Name: Polynesian Ruderal Montane-Subalpine Rainforest

***Type Concept:**

***Diagnostic Characteristics:**

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION

***Geographic Range:**

Nations:

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

Author of Description:*Acknowledgments [optional]:**

REFERENCES

***References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

1.A.4.Ob. Polynesian Flooded & Swamp Forest (D003)**M204. Polynesian Ruderal Flooded & Swamp Forest**

1. Forest & Woodland

1.A.4.Ob. Polynesian Flooded & Swamp Forest

G399. Hawaiian Ruderal Flooded & Swamp Forest

Type Concept Sentence: Lowland riparian floodplains dominated by non-native introduced tree species such as *Aleurites moluccanus*, *Cordyline fruticosa*, *Colocasia esculenta*, *Hibiscus tiliaceus*, and *Syzygium malaccense*.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.A.4.Ob.90. Polynesian Ruderal Flooded & Swamp Forest (M204)

Elcode: G399

***Scientific Name:** *Aleurites moluccanus* - *Hibiscus tiliaceus* Ruderal Flooded & Swamp Forest Group

***Common (Translated Scientific) Name:** Kukui - Hou Ruderal Flooded & Swamp Forest Group

***Colloquial Name:** Hawaiian Ruderal Flooded & Swamp Forest

***Type Concept:** This group occurs on low-elevation valley floors (typically up to 122 m [400 feet], but may extend up to 420 m [1380 feet]) containing perennial streams that flood every 1 to 5 years. Valley floors typically widen towards the ocean (up to 1 mile), forming broad floodplains that allow periodic shifting of the stream channel. Soils are alluvial deposits and clay that remain moist due to influence from stream channel flooding, a shallow subsurface water table, and nutrient-rich alluvium deposited during flood events. Vegetation of floodplain forests is typically dominated by Polynesian-introduced lowland wet trees tolerant of occasional flooding. *Aleurites moluccanus* (Polynesian introduction) and *Metrosideros polymorpha* (native) can form a patch mosaic with *Hibiscus tiliaceus* (Polynesian introduction) that extends onto adjacent steeper gulches and coastal areas. *Aleurites moluccanus* mixes in patches and extends up steep gulches well into the lowland zone. Plant species indicative of Polynesian agriculture dominate the majority of the floodplain forest, including *Cordyline fruticosa*, *Colocasia esculenta*, and *Syzygium malaccense*. These

are species that can escape cultivation and invade non-tilled and untended fields, where they may form dominant stands.

***Diagnostic Characteristics:**

***Classification Comments:** This group contains those areas dominated by non-native species *Aleurites moluccanus* and *Hibiscus tiliaceus* that may occur in higher elevation wet areas away from the coast or channels, but are generally on stream terraces and lower slopes above channels.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Tall spreading trees 10-20 m tall with native or non-native undergrowth.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Stands are dominated by *Aleurites moluccanus*, *Cordyline fruticosa*, *Colocasia esculenta*, *Hibiscus tiliaceus*, and/or *Syzygium malaccense*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description: This group occurs on low-elevation valley floors (up to 122 m [400 feet], but may extend up to 420 m [1380 feet]) containing perennial streams that once flooded every 1 to 5 years. Today flows are controlled by dams and irrigation is controlled as much of the valley floor is converted to agriculture. Valley floors typically widen towards the ocean (up to 1 mile), forming broad floodplains that allow periodic shifting of the stream channel.

Climate: The tropical climate varies from arid to humid depending on location. Leeward sites are generally drier than windward sites because of the rainshadow effect from tall mountains and ridges.

Soil/substrate/hydrology: Soils are alluvial deposits and clay that remain moist due to influence from stream channel flooding, a shallow subsurface water table, and nutrient-rich alluvium deposited during flood events. In general Hawaiian watersheds are generally short and steep, and they have small drainage basins and minimal channel storage of water.

DISTRIBUTION

***Geographic Range:** This group occurs as narrow bands of terrestrial vegetation bordering perennial streams from near sea level to 915 m (3000 feet) elevation on Kaua'i, O'ahu, Moloka'i, Lâna'i, Maui, and Hawai'i.

Nations: US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP***Primary Concept Source [if applicable]:** W.C. Gagne and L.W. Cuddihy (1990)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel

Acknowledgments [optional]:

Version Date: 26 May 2016

REFERENCES***References [Required if used in text]:**

- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Gagne, W. C., and L. W. Cuddihy. 1990. Vegetation. Pages 45-114 in: W. L. Wagner, D. R. Herbst, and S. H. Sohmer, editors. Manual of the Flowering Plants of Hawaii. 2 volumes. University of Hawaii Press, Honolulu.
- Loope, L. L., R. J. Nagata, and A. C. Medeiros. 1992. Alien plants in Haleakala National Park. In: C. P. Stone, C. W. Smith, and T. Tunison, editors. Alien plant invasions in native ecosystems of Hawaii: Management and research. Cooperative National Park Resources Study Unit, Department of Botany Technical Report. University of Hawaii Press, Honolulu.

1. Forest & Woodland

1.A.4.Ob. Polynesian Flooded & Swamp Forest

G400. Central & Southern Polynesian Ruderal Flooded & Swamp Forest**Type Concept Sentence:****OVERVIEW*****Hierarchy Level:** Group***Placement in Hierarchy:** 1.A.4.Ob.90. Polynesian Ruderal Flooded & Swamp Forest (M204)

Elcode: G400

Scientific Name:** Central & Southern Polynesian Ruderal Flooded & Swamp Forest GroupCommon (Translated Scientific) Name:** Central & Southern Polynesian Ruderal Flooded & Swamp Forest Group***Colloquial Name:** Central & Southern Polynesian Ruderal Flooded & Swamp Forest***Type Concept:**

***Diagnostic Characteristics:**

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION

***Geographic Range:**

Nations:

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description:

Acknowledgments [optional]:

REFERENCES

*References [Required if used in text]:

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

1. Forest & Woodland

1.A.4.Ob. Polynesian Flooded & Swamp Forest

G401. Micronesian Ruderal Flooded & Swamp Forest

Type Concept Sentence:

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 1.A.4.Ob.90. Polynesian Ruderal Flooded & Swamp Forest (M204)

Elcode: G401

*Scientific Name: Micronesian Ruderal Flooded & Swamp Forest Group

*Common (Translated Scientific) Name: Micronesian Ruderal Flooded & Swamp Forest Group

*Colloquial Name: Micronesian Ruderal Flooded & Swamp Forest

*Type Concept:

*Diagnostic Characteristics:

*Classification Comments:

*Similar NVC Types [if applicable]:

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION

***Geographic Range:**

Nations:

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:**

Acknowledgments [optional]:

REFERENCES

***References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

1.A.5.Wb. Indo-West Pacific Mangrove (D071)**M209. Indo-West Pacific Ruderal Mangrove**

1. Forest & Woodland

1.A.5.Wb. Indo-West Pacific Mangrove

G404. West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Mangrove

Type Concept Sentence:

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.A.5.Wb.90. Indo-West Pacific Ruderal Mangrove (M209)

Elcode: G404

***Scientific Name:** West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Mangrove Group

***Common (Translated Scientific) Name:** West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Mangrove Group

***Colloquial Name:** West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Mangrove

***Type Concept:**

***Diagnostic Characteristics:**

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION***Geographic Range:****Nations:****States/Provinces:**

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS***Plot Analysis Summary [Med - High Confidence]:*****Plots Used to Define the Type [Med - High Confidence]:****CONFIDENCE LEVEL****USNVC Confidence Level:**

USNVC Confidence Comments [optional]:

HIERARCHY***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS**Supporting Concepts [optional]:**

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP***Primary Concept Source [if applicable]:** Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:**

Acknowledgments [optional]:

REFERENCES***References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

1.B.1.Na. Southeastern North American Forest & Woodland (D006)**M305. Southeastern North American Ruderal Forest**

1. Forest & Woodland

1.B.1.Na. Southeastern North American Forest & Woodland

G031. Southeastern Native Ruderal Forest

Type Concept Sentence: This native ruderal forest group is found on former agricultural or forest plantation sites, or arises from degraded native forest sites in the warmer temperate regions of the southeastern United States.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.B.1.Na.90. Southeastern North American Ruderal Forest (M305)

Elcode: G031

***Scientific Name:** *Pinus taeda* - *Liquidambar styraciflua* - *Triadica sebifera* Ruderal Forest Group

***Common (Translated Scientific) Name:** Loblolly Pine - Sweetgum - Chinese Tallow Ruderal Forest Group

***Colloquial Name:** Southeastern Native Ruderal Forest

***Type Concept:** This ruderal native forest group occurs in old-field and other human-disturbed sites across the southeastern United States. The vegetation shows evidence of former and heavy human use, such as formerly cleared and/or planted sites, but which has been allowed to succeed more-or-less spontaneously, as determined by the vegetation being dominated (>80% cover) by ruderal native tree species. Understory shrub and herb species may be a mix of exotic species and native generalists. Some typical native ruderal species include conifer *Pinus taeda*, and hardwoods *Catalpa bignonioides*, *Catalpa speciosa*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Maclura pomifera*, and *Quercus nigra*. Exotic associates may include *Albizia julibrissin*, *Broussonetia papyrifera*, *Triadica sebifera* (= *Sapium sebiferum*), and *Maclura pomifera*. *Maclura pomifera* is a native species in a narrow region of the eastern U.S., but is so widely planted outside of its range that it is effectively exotic. Where both the ground layer and tree layer are native ruderals, the stand may overlap with degraded phases of other native forest types.

***Diagnostic Characteristics:** Stands are dominated by some combination of weedy or native generalist tree species, such as *Pinus taeda*, *Catalpa bignonioides*, *Catalpa speciosa*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, or *Quercus nigra*. Minor associates may include the exotic tree species *Albizia julibrissin*, *Broussonetia papyrifera*, *Triadica sebifera*, and *Maclura pomifera*.

***Classification Comments:** This group is somewhat separated from ~Eastern North American Native Ruderal Forest Group (G030)\$\$ by the absence of ruderal species of generally northern distribution, such as *Populus tremuloides*, *Betula populifolia*, *Prunus pennsylvanica*, *Juglans nigra*, *Gleditsia triacanthos*, *Robinia pseudoacacia*, and even *Liriodendron tulipifera*. Native forest plantation stands (tracked in 7. ~Agricultural & Developed Vegetation Cultural Class (CCL01)\$\$) could become this ruderal type if not intensively managed, as the planted trees begin to die out, and the ground layer is invaded by native ruderal species.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G032	Eastern North American Exotic Ruderal Forest	
G030	Eastern North American Native Ruderal Forest	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Tree canopy varies from hardwood-dominated to conifer-dominated, with open to closed canopy cover. Stands have an irregular structure, though remnants of abandoned forest plantation structure, such as row plantings, may be evident in some cases.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: The vegetation is dominated (>80% cover) by ruderal native tree species. Understory shrub and herb species may be a mix of exotic species and native generalists. Some typical native ruderal species include conifer *Pinus taeda*, and hardwoods *Catalpa bignonioides*, *Catalpa speciosa*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Maclura pomifera*, and *Quercus nigra*. Minor exotic associates may include *Albizia julibrissin*, *Broussonetia papyrifera*, *Triadica sebifera* (= *Sapium sebiferum*), and *Maclura pomifera*. *Maclura pomifera* is a native species in a narrow region of the eastern U.S., but is so widely planted outside of its range that it is effectively exotic. Where both the ground layer and tree layer are native ruderals, the stand may overlap with degraded phases of other native forest types.

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Native ruderal tree species may initiate establishment before exotics or outcompete exotics. Canopy cover may be as low as 10%, but eventually stands may have more-or-less continuous canopy, leading to a shift to a more shade-tolerant ground layer. The successional stages of this type have been described in many studies, particularly the early stages of tree invasion into old fields (e.g., Singleton et al. 2001). See also Wright and Fridley (2010) for the biogeographic variation among stands of this type. This type may also form in other ways. First, native forest plantation stands (tracked in 7. ~Agricultural & Developed Vegetation Cultural Class (CCL01)\$\$) could become native ruderal stands if not intensively managed and the planted trees begin to die out. Second, native forest stands that have not been plowed or planted may be stressed to the point where the characteristic native combination of species is altered (Curtis 1959). These stands are probably best tracked as altered variants of native types until the overstory itself is substantially altered to the point where exotics tree species are the dominant.

ENVIRONMENT

Environmental Description: Sites include uplands and marginally wet sites that have been altered by logging, clearing for agriculture or other activities. Sites are often on dry-mesic to wet-mesic sites, suitable for agriculture or forest plantations.

DISTRIBUTION

***Geographic Range:** This ruderal native forest group occurs in old-field and other human-disturbed sites across the southeastern United States.

Nations: US

States/Provinces: AL, AR, FL, GA, KY, LA, MD, MO?, MS, NC, OK, SC, TN, TX, VA

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3231	<i>Pinus taeda</i> - <i>Liriodendron tulipifera</i> - <i>Liquidambar styraciflua</i> Ruderal Forest Alliance
A3232	<i>Liquidambar styraciflua</i> - <i>Celtis laevigata</i> - <i>Quercus nigra</i> Ruderal Forest Alliance
A4114	<i>Crataegus flava</i> - <i>Quercus incana</i> Ruderal Sandhills Scrub Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: D. Faber-Langendoen and S. Menard (2006)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: D. Faber-Langendoen

Acknowledgments [optional]:

Version Date: 12 May 2015

REFERENCES

*References [Required if used in text]:

- Curtis, J. T. 1959. The vegetation of Wisconsin: An ordination of plant communities. Reprinted in 1987. University of Wisconsin Press, Madison. 657 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Faber-Langendoen, D., and S. Menard. 2006. A key to eastern forests of the United States: Macrogroups, groups, and alliances. September 15, 2006. NatureServe, Arlington, VA.
- Singleton, R., S. Gardescu, P. L. Marks, and M. A. Geber. 2001. Forest herb colonization of postagricultural forests in central New York State, USA. *Journal of Ecology* 89:325-338.
- Wright, J. P., and J. D. Fridley. 2010. Biogeographic synthesis of secondary succession rates in eastern North America. *Journal of Biogeography* 37:1584-1596.

1. Forest & Woodland

1.B.1.Na. Southeastern North American Forest & Woodland

G029. Southeastern Exotic Ruderal Forest

Type Concept Sentence: This ruderal forest group is dominated by exotic tree species that establish on former agricultural or forest plantation sites, or on degraded native forest sites, in the southeastern United States.

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 1.B.1.Na.90. Southeastern North American Ruderal Forest (M305)

Elcode: G029

*Scientific Name: *Pinus taeda* - *Pinus* spp. Ruderal Forest Group

*Common (Translated Scientific) Name: Loblolly Pine - Pine species Ruderal Forest Group

*Colloquial Name: Southeastern Exotic Ruderal Forest

*Type Concept: The vegetation of this group shows evidence of former and heavy human disturbance, particularly to the soils, such as through plowing, grading, skidding, etc., but has otherwise been allowed to succeed more-or-less spontaneously. The vegetation is a disparate mix of exotic species, and the ecological and floristic organization of the vegetation is not clear. The tree layer is dominated (>80% cover) by exotic tree species. Understory shrub and herb species may be a mix of exotic and native generalists. Dominant exotic tree species include *Albizia julibrissin*, *Broussonetia papyrifera*, *Triadica sebifera* (= *Sapium sebiferum*), and *Maclura pomifera*. *Maclura pomifera* is a native species in a narrow region of the eastern U.S., but is so widely planted outside of its range that it is effectively exotic. Minor native associates include conifer *Pinus taeda*, and hardwoods *Catalpa bignonioides*, *Catalpa speciosa*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Maclura pomifera*, and *Quercus nigra*. Some plantation stands are planted for restoration purposes (e.g., to provide cover on abandoned farmland or land prone to erosion), and these may be allowed to mature and die, with native trees invading into the understory and eventually into the canopy.

*Diagnostic Characteristics: A specified list of exotic tree species [see Floristics] form mono-dominant stands and typically have associated shrub and herb layers that contain native generalist or exotic species. The exotics are >80% (>90%?) of the canopy. Sites may show evidence of former and heavy human use as either agricultural fields or plantations. Regeneration of tree species, if present at all, rarely consists of the current overstory, and understory shrub and herb species are often native generalists or exotics.

*Classification Comments:

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G032	Eastern North American Exotic Ruderal Forest	

Similar NVC Types General Comments [optional]:**VEGETATION**

Physiognomy and Structure Summary: This group includes spontaneously formed exotic tree-dominated stands, with irregular structure, or abandoned forest plantations, which may still show some evidence of row planting. Dominant trees may be hardwood or conifer.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: The tree layer is dominated (>80% cover) by exotic tree species. Understory shrub and herb species may be a mix of exotic species and native generalists. Dominant exotic tree species include *Albizia julibrissin*, *Broussonetia papyrifera*, *Triadica sebifera* (= *Sapium sebiferum*), and *Maclura pomifera*. *Maclura pomifera* is a native species in a narrow region of the eastern U.S., but is so widely planted outside of its range that it is effectively exotic. Minor native associates conifer *Pinus taeda*, and hardwoods *Catalpa bignonioides*, *Catalpa speciosa*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Maclura pomifera*, and *Quercus nigra*.

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Const-ancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Exotic tree species may initiate establishment before natives or outcompete natives. Canopy cover may be as low as 10%, but eventually stands may have more-or-less continuous canopy, leading to a shift to a more shade-tolerant ground layer. The successional stages of this type have been described in many studies, particularly the early stages of tree invasion into old fields (e.g., Singleton et al. 2001). See also Wright and Fridley (2010) for the biogeographic variation among stands of this type. This type may also form in other ways. First, exotic forest plantation stands (tracked in 7. ~Agricultural & Developed Vegetation Cultural Class (CCL01)\$)\$) could become exotic ruderal stands if not intensively managed and the planted trees begin to die out. But because exotic planted trees only rarely regenerate on sites where they are planted, these stands more typically are invaded by native generalist trees and succeed to ~Eastern North American Native Ruderal Forest Group (G030)\$\$. Second, native forest stands that have not been plowed or planted may be stressed to the point where the characteristic native combination of species is altered (Curtis 1959). These stands are probably best tracked as altered variants of native types until the overstory itself is substantially altered to the point where exotics tree species are dominant.

ENVIRONMENT

Environmental Description: The sites where this vegetation occurs have experienced heavy former human use, including farming, pasture establishment and grazing, mining, repeated logging, etc. These sites may have been formerly cleared and/or planted, and the subsequent and current disturbance may be minimal to continuous.

DISTRIBUTION

***Geographic Range:** This type occurs in the south-central and southeastern United States.

Nations: US

States/Provinces: AL, AR, FL, GA, KY, LA, MO?, MS, NC, OK, SC, TN, TX, VA?

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3233	<i>Albizia julibrissin</i> - <i>Broussonetia papyrifera</i> - <i>Triadica sebifera</i> Ruderal Forest Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** D. Faber-Langendoen and S. Menard (2006)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** D. Faber-Langendoen

Acknowledgments [optional]:

Version Date: 12 May 2015

REFERENCES

***References [Required if used in text]:**

- Curtis, J. T. 1959. The vegetation of Wisconsin: An ordination of plant communities. Reprinted in 1987. University of Wisconsin Press, Madison. 657 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Faber-Langendoen, D., and S. Menard. 2006. A key to eastern forests of the United States: Macrogroups, groups, and alliances. September 15, 2006. NatureServe, Arlington, VA.
- Singleton, R., S. Gardescu, P. L. Marks, and M. A. Geber. 2001. Forest herb colonization of postagricultural forests in central New York State, USA. *Journal of Ecology* 89:325-338.
- Wright, J. P., and J. D. Fridley. 2010. Biogeographic synthesis of secondary succession rates in eastern North America. *Journal of Biogeography* 37:1584-1596.

1.B.1.Nc. Californian Forest & Woodland (D007)**M513. Californian Ruderal Forest**

1. Forest & Woodland

1.B.1.Nc. Californian Forest & Woodland

G678. Californian Ruderal Forest

Type Concept Sentence: These ruderal forests and woodlands are generally found in cismontane California and Baja California, Mexico, and are strongly dominated (>90% relative cover) by exotic tree species such as *Eucalyptus viminalis*, *Myoporum laetum*, and *Schinus* spp. This type also includes degraded natural forests and woodlands with an understory strongly dominated by exotic species (>90% relative cover).

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.B.1.Nc.90. Californian Ruderal Forest (M513)

Elcode: G678

***Scientific Name:** Californian Ruderal Forest Group

***Common (Translated Scientific) Name:** Californian Ruderal Forest Group

***Colloquial Name:** Californian Ruderal Forest

***Type Concept:** These ruderal forests and woodlands are generally found in cismontane California and Baja California, Mexico. Stands have an open to dense tree canopy (>10% tree cover), 5-50 m tall that is strongly dominated (>90% relative cover) by exotic tree species. Exotic dominant/diagnostic species include *Acacia cyclops*, *Acacia dealbata*, *Acacia melanoxylon*, *Acacia redolens*, *Ailanthus altissima*, *Eucalyptus camaldulensis*, *Corymbia citriodora* (= *Eucalyptus citriodora*), *Eucalyptus cladocalyx*, *Eucalyptus globulus*, *Eucalyptus polyanthemos*, *Eucalyptus pulverulenta*, *Eucalyptus sideroxylon*, *Eucalyptus tereticornis*, *Eucalyptus viminalis*, *Ficus carica*, *Myoporum laetum*, *Pinus halepensis*, *Prunus mahaleb*, *Robinia pseudoacacia*, *Schinus molle*, and *Schinus terebinthifolius*. This type also includes degraded natural forests and woodlands with an understory strongly dominated by exotic species (>90% relative cover). Stands occur from near sea level to up to 300 m elevation. Habitats include coastal canyons, foothill and mountain slopes, valleys, and roadsides. Although sites may be relatively mesic, riparian stands are not included in this group. Many of these species were planted as groves and windbreaks, and then naturalized. Birds disperse the colored fruits allowing seedlings to establish in wildland vegetation. Many of the trees are common ornamentals that have escaped from cultivation. Understories in groves of these fast-growing, long-lived trees are usually depauperate. With dominance of *Eucalyptus*, a buildup of allelopathic chemicals may occur in the soil and high volumes of debris inhibit establishment of other plants.

***Diagnostic Characteristics:** These ruderal forests and woodlands occur in generally cismontane California and Baja California, Mexico, and are strongly dominated (>90% relative cover) by exotic tree species such as *Acacia cyclops*, *Acacia dealbata*, *Acacia melanoxylon*, *Acacia redolens*, *Ailanthus altissima*, *Eucalyptus camaldulensis*, *Corymbia citriodora*, *Eucalyptus cladocalyx*, *Eucalyptus globulus*, *Eucalyptus polyanthemos*, *Eucalyptus pulverulenta*, *Eucalyptus sideroxylon*, *Eucalyptus tereticornis*, *Eucalyptus viminalis*, *Ficus carica*, *Myoporum laetum*, *Pinus halepensis*, *Prunus mahaleb*, *Robinia pseudoacacia*, *Schinus molle*, and *Schinus terebinthifolius*. This type also includes degraded natural forests and woodlands with an understory strongly dominated by exotic species (>90% relative cover).

***Classification Comments:** Stands have not been a high priority for descriptive sampling. Therefore, the further evaluation of other ruderal stands containing non-native *Acacia* (several species of Australasian origin) or other tree or shrub taxa are not well-understood in California or adjacent Pacific states and northern Baja California, Mexico. Differentiation between old plantings and adventive stands is sometimes difficult, especially with native species of *Cupressus* or *Pinus radiata*. In addition, some of the characteristic exotic tree species such as species of *Schinus* and *Myoporum* are shared with ruderal types that occur in riparian areas in California such as ~Interior West Ruderal Riparian Forest & Scrub Group (G510)\$\$ (Sawyer et al. 2009). Most stands in this group have native overstory (often oaks) with an exotic herbaceous understory. The criteria defining some of these semi-natural or ruderal stands are more narrowly defined in the USNVC than criteria in Sawyer et al. (2009) requiring >90% relative cover of exotics tree versus >80%.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G624	Western North American Interior Ruderal Grassland & Shrubland	may share some dominant/diagnostic exotic species with ruderal riparian forests in California that would be included in ~Interior West Ruderal Riparian Forest & Scrub Group (G510)\$\$.

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: These are ruderal, mostly broad-leaved, evergreen forests and woodlands and scrub woodlands (*Schinus* spp.). Stand have an open to dense tree canopy (>10% tree cover), 5-50 m tall that is strongly dominated (>90% relative cover) by exotic tree species.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: These ruderal forests and woodlands are generally found in upland cismontane California. Stand have an open to dense tree canopy (>10% tree cover) strongly dominated (>90% relative cover) by exotic tree species. There are many possible dominant/diagnostic trees such as include *Acacia cyclops*, *Acacia dealbata*, *Acacia melanoxylon*, *Acacia redolens*, *Ailanthus altissima*, *Eucalyptus* spp., *Ficus carica*, *Myoporum laetum*, *Pinus halepensis*, *Prunus mahaleb*, *Robinia pseudoacacia*, *Schinus molle*, and *Schinus terebinthifolius*. Many are common ornamentals that have escaped from cultivation. DiTomaso and Healy (2007) consider *Myoporum laetum* and *Pinus halepensis* invasive in California. At least nine species of *Eucalyptus* occur in California: *Eucalyptus camaldulensis*, *Corymbia citriodora* (= *Eucalyptus citriodora*), *Eucalyptus cladocalyx*, *Eucalyptus globulus*, *Eucalyptus polyanthemus*, *Eucalyptus pulverulenta*, *Eucalyptus sideroxylon*, *Eucalyptus tereticornis*, and *Eucalyptus viminalis*, where they invade wildland settings. Some of these exotic tree species also invade riparian areas, but those stands are not considered part of this upland group. Planted woodland and forest stands are considered to be cultural types, not ruderal. This type also includes much degraded natural forests and woodlands with an understory strongly dominated by herbaceous exotic species (>90% relative cover). Common invasive herbaceous species may include graminoids *Bromus hordeaceus*, *Bromus madritensis*, *Bromus rubens*, *Cynosurus echinatus*, *Hordeum murinum*, *Lolium perenne*, *Schismus arabicus*, *Schismus barbatus*, *Vulpia bromoides*, and *Vulpia myuros*, and forbs *Brassica nigra*, *Cerastium glomeratum*, *Carduus pycnocephalus*, *Centaurea* spp., *Conium maculatum*, *Daucus pusillus*, *Erodium botrys*, *Erodium cicutarium*, *Foeniculum vulgare*, *Geranium dissectum*, *Hirschfeldia incana*, *Hypochaeris glabra*, *Hypochaeris radicata*, *Leontodon taraxacoides*, *Medicago polymorpha*, *Melilotus indicus*, *Raphanus sativus*, *Rumex acetosella*, *Rumex crispus*, *Silybum marianum*, *Taeniatherum caput-medusae*, *Trifolium hirtum*, and *Vicia villosa*.

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Many of the dominant/diagnostic species in this group, such as species of *Eucalyptus*, *Myoporum*, and *Schinus*, are fire-adapted and sprout after being top-killed by fire (Sawyer et al. 2009). Many are evergreen with aromatic compound leaves. Birds disperse the colored fruits allowing seedlings to establish in wildland vegetation. Many are common ornamentals that have escaped from cultivation.

ENVIRONMENT

Environmental Description: These ruderal forests and woodlands are generally found in cismontane California and Baja California, Mexico. They occur from near sea level to up to 300 m elevation (Sawyer et al. 2009). Habitats include coastal canyons, foothill and mountain slopes, valleys, and roadsides. Although sites may be relatively mesic, riparian stands are not included in this group. Many species of *Eucalyptus* occur in California. The following remarks from Sawyer et al. (2009) mainly refer to *Eucalyptus globulus*, but management considerations are similar for the other species where they invade wildland settings. The genus is native to Australia. It was planted as groves and windbreaks and become naturalized on uplands and stream courses. Understories in groves of these fast-growing, long-lived trees are usually depauperate. A buildup of allelopathic chemicals in the soil and high volumes of debris inhibit establishment of other plants, though sometimes other non-natives, such as *Hedera helix*, clamber extensively in stands.

Climate: The climate is Mediterranean. *Soil/substrate/hydrology:* This broadly defined, ruderal group occurs on a variety of soils derived from many different substrates.

DISTRIBUTION

***Geographic Range:** This group is found in California coastal areas, the Central Valley, and southern California ranges and valleys, as well as Baja California, Mexico.

Nations: MX, US

States/Provinces: CA, MXBC

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL**USNVC Confidence Level:** Moderate**USNVC Confidence Comments [optional]:****HIERARCHY*****Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A0084	<i>Eucalyptus</i> spp. Ruderal Forest Alliance
A3329	<i>Schinus molle</i> - <i>Schinus terebinthifolius</i> - <i>Myoporum laetum</i> Ruderal Woodland Alliance

DISCUSSION**Discussion [optional]:****CONCEPT HISTORY*****Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS**Supporting Concepts [optional]:**

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	<i>Schinus (molle, terebinthifolius) - Myoporum laetum</i> (Pepper tree or Myoporum groves) Semi-natural Stands	Sawyer et al. 2009	79.200.00
<	<i>Eucalyptus (globulus, camaldulensis)</i> (Eucalyptus groves) Semi-natural Stands	Sawyer et al. 2009	79.100.00

AUTHORSHIP***Primary Concept Source [if applicable]:** Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** M.S. Reid and K.A. Schulz**Acknowledgments [optional]:** T. Keeler-Wolf

Version Date: 21 May 2015

REFERENCES***References [Required if used in text]:**

- DiTomaso, J. M., and E. A. Healy. 2007. Weeds of California and other western States. Two volumes. Publication 3488. University of California, Agriculture and Natural Resources, Oakland, CA. 1808 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Sawyer, J. O., T. Keeler-Wolf, and J. Evens. 2009. A manual of California vegetation. Second edition. California Native Plant Society, Sacramento CA. 1300 pp.

1.B.2.Na. Eastern North American Forest & Woodland (D008)**M013. Eastern North American Ruderal Forest**

1. Forest & Woodland

1.B.2.Na. Eastern North American Forest & Woodland

G030. Eastern North American Native Ruderal Forest

Type Concept Sentence: This native ruderal forest group is found on former agricultural or forest plantation sites, or arises from degraded native forest sites, in the cool temperate regions of the eastern United States and Canada.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.B.2.Na.90. Eastern North American Ruderal Forest (M013)

Elcode: G030

***Scientific Name:** *Juniperus virginiana* - *Liriodendron tulipifera* / *Lonicera tatarica* Ruderal Forest Group

***Common (Translated Scientific) Name:** Eastern Red-cedar - Tuliptree / Tatarian Honeysuckle Ruderal Forest Group

***Colloquial Name:** Eastern North American Native Ruderal Forest

***Type Concept:** This native ruderal forest group is found in the cool temperate regions of eastern United States and Canada, from the East Coast, west to the Great Lakes and Tallgrass Prairie region and south to the south-central United States. The vegetation of this group shows evidence of former and heavy human disturbance, particularly to the soils, such as through plowing, grading, skidding, etc., but has otherwise been allowed to succeed more-or-less spontaneously. The vegetation is a somewhat disparate mix of weedy and native species, and the ecological and floristic organization of the vegetation is not clear. The tree layer is dominated (>50% cover) by "weedy" or generalist native tree species, sometimes accompanied by exotic/invasive tree species. The list of ruderal tree species is as follows: **Conifers:** *Juniperus virginiana*, *Pinus rigida*, *Pinus strobus*, *Pinus virginiana*. **Hardwoods:** *Acer negundo*, *Acer rubrum*, *Amelanchier* spp., *Betula populifolia*, *Crataegus* spp., *Crataegus crus-galli*, *Crataegus mollis*, *Diospyros virginiana*, *Fraxinus americana*, *Gleditsia triacanthos*, *Gymnocladus dioica*, *Juglans nigra*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Morus* spp., *Malus fusca*, *Morus rubra*, *Populus tremuloides*, *Prunus pensylvanica*, *Prunus serotina*, *Prunus americana*, and *Robinia pseudoacacia*. Naturalized exotics include the conifer *Pinus thunbergii* and hardwoods *Acer platanoides* and *Ailanthus altissima*. *Robinia pseudoacacia*, although a native in the central hardwoods region, is so widely planted outside of its range that it is essentially exotic in character. The weedy natives often form mono-dominant or mixed dominance stands. Understory shrub and herb species vary from exotic invasives to native generalists. Invasive shrub species include a variety of honeysuckles (*Lonicera japonica*, *Lonicera morrowii*, *Lonicera tatarica*, *Lonicera x bella*), *Rhamnus cathartica*, and others. Sites show evidence of former and heavy human use, particularly with extensive and intensive soil disturbances, including plowing, grading, skidding, etc. Sites are often on dry-mesic to wet-mesic sites, suitable for agriculture or forest plantations.

***Diagnostic Characteristics:** A specified list of "weedy" or generalist native species [see Floristics] form mono-dominant stands and typically have associated shrub and herb layers that contain generalist native or exotic species. The weedy natives are >80% (>90%?) of the canopy.

***Classification Comments:** This group is defined by a specified list of generalist native species, sometimes accompanied by naturalized exotics. The concept of this group is being tested by a USGS Forest Inventory and Analysis (FIA) project with NatureServe staff and USFS staff (Faber-Langendoen and Menard 2006). Species that typify the ruderal category include those that are able to establish on disturbed sites, especially when the disturbance includes soil alternation, such as plowing, landfills, graded sites, etc. Species traits include shade intolerance, wind dispersal, and high reproductive capacity. More information on the characteristic dominant trees on these ruderal sites is needed to distinguish this group from ~Southeastern Native Ruderal Forest Group (G031)\$. Species more typical of that group include *Carya illinoensis*, *Catalpa* spp. (including *Catalpa bignonioides*, *Catalpa speciosa*), or *Maclura pomifera*. Where the ground layer is native and the ruderal tree species is native (e.g., *Cornus florida*), the stand may better fit into a successional phase of a native type. This group could be split into conifer-dominated versus hardwood-dominated stands, or by dry versus mesic sites, or by native versus exotics species. Decisions will be deferred until alliances are better developed.

Native forest plantation stands (tracked in 7. ~Agricultural & Developed Vegetation Cultural Class (CCL01)\$\$) could become this ruderal type if not intensively managed, as the planted trees begin to die out and the ground layer is invaded by native ruderal species.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G031	Southeastern Native Ruderal Forest	
G032	Eastern North American Exotic Ruderal Forest	
G059	Eastern North American Ruderal Meadow & Shrubland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Tree canopy varies from hardwood-dominated to conifer-dominated, with open to closed canopy cover. Stands have an irregular structure, though remnants of abandoned forest plantation structure, such as row plantings, may be evident in some cases.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: The vegetation is a somewhat disparate mix of weedy and native species, and the ecological and floristic organization of the vegetation is not clear. The tree layer is dominated by >80% (>90%?) cover of "weedy" or generalist native tree species, as compared to exotic/invasive tree species. The list of ruderal tree species is as follows: **Conifers:** *Juniperus ashei*, *Juniperus virginiana*, *Pinus rigida*, *Pinus strobus*, *Pinus virginiana*. **Hardwoods:** *Acer negundo*, *Acer platanoides*, *Acer rubrum*, *Ailanthus altissima*, *Amelanchier* spp., *Betula populifolia*, *Crataegus* spp., *Crataegus crus-galli*, *Crataegus mollis*, *Diospyros virginiana*, *Fraxinus americana*, *Gleditsia triacanthos*, *Gymnocladus dioicus*, *Juglans nigra*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Morus* spp., *Malus fusca*, *Morus rubra*, *Populus tremuloides*, *Prunus pensylvanica*, *Prunus serotina*, *Prunus americana*, and *Robinia pseudoacacia*. These species form mono-dominant or mixed dominance stands. Understory shrub and herb species vary from exotic invasives to native generalists. Invasive shrub species include a variety of honeysuckles (*Lonicera japonica*, *Lonicera morrowii*, *Lonicera tatarica*, *Lonicera x bella*), *Rhamnus cathartica*, and others.

*Floristics Table [Med - High Confidence]:

*Number of Plots:

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Stands most typically represent the tree-dominated stage in the development of vegetation on sites that were heavily disturbed by humans, including plowing, grading, skidding, etc. In these cases, earlier stages of vegetation include annual and perennial weeds, grasslands and shrublands [see ~Eastern North American Ruderal Meadow & Shrubland Group (G059)\$\$. Because the extensive soil disturbances typically lead to a mix of weedy native and exotic shrub and herb species, the stands take on a ruderal composition, even if native trees invade or are planted. Canopy cover may be as low as 10%, but eventually stands may have more-or-less continuous canopy, leading to a shift to a more shade-tolerant ground layer.

The successional stages of this type have been described in many studies, particularly the early stages of tree invasion into old fields (e.g., Singleton et al. 2001), as have the limited recovery of these ruderal forests to a composition resembling the historic native forests of the region (Bellemare et al. 2002). See also Wright and Fridley (2010) for the biogeographic variation among stands of this type.

This type may also form in other ways. First, native forest plantation stands (tracked in 7. ~Agricultural & Developed Vegetation Cultural Class (CCL01)\$)\$) could become ruderal stands if not intensively managed, as the planted trees begin to die out, and the ground layer is invaded by native species. Second, native forest stands that have not been plowed or planted may be stressed to the point where the characteristic native combination of species is altered (Curtis 1959). These stands are probably best tracked as altered variants of native types until the overstory itself is substantially altered.

ENVIRONMENT

Environmental Description: Sites show evidence of former and heavy human use, particularly with extensive and intensive soil disturbances, including plowing, grading, skidding, etc. Sites are often on dry-mesic to wet-mesic sites, suitable for agriculture or forest plantations.

DISTRIBUTION

***Geographic Range:** This native ruderal forest group is found in the cool temperate regions of eastern United States and Canada, from the East Coast, west to the Great Lakes and Tallgrass Prairie region and south to the south-central United States.

Nations: CA, US

States/Provinces: CT, DC, DE, IA, IL, IN, KS, KY, MA, MB?, MD, ME, MI, MN, MO, NB, NC, ND, NE, NF, NH, NJ, NS, NY, OH, ON, PA, PE, QC, RI, SC, SD, TN, VA, VT, WI, WV

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS***Plot Analysis Summary [Med - High Confidence]:*****Plots Used to Define the Type [Med - High Confidence]:****CONFIDENCE LEVEL****USNVC Confidence Level:** Low**USNVC Confidence Comments [optional]:****HIERARCHY*****Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3229	<i>Acer rubrum</i> - <i>Prunus serotina</i> - <i>Pinus strobus</i> Ruderal Forest Alliance
A4183	<i>Acer negundo</i> - <i>Fraxinus pennsylvanica</i> - <i>Populus tremuloides</i> Ruderal Forest Alliance
A3227	<i>Juniperus virginiana</i> - <i>Pinus virginiana</i> - <i>Pinus echinata</i> Ruderal Forest Alliance
A3228	<i>Liriodendron tulipifera</i> - <i>Juglans nigra</i> - <i>Robinia pseudoacacia</i> Ruderal Forest Alliance
A4184	<i>Populus deltoides</i> Ruderal Upland Forest Alliance
A2023	<i>Juniperus ashei</i> Southeast Great Plains Ruderal Forest Alliance

DISCUSSION**Discussion [optional]:****CONCEPT HISTORY*****Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS**Supporting Concepts [optional]:**

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP***Primary Concept Source [if applicable]:** D. Faber-Langendoen and S. Menard (2006)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** D. Faber-Langendoen**Acknowledgments [optional]:** S. Franklin, J. Vanderhorst

Version Date: 05 May 2015

REFERENCES***References [Required if used in text]:**

- Bellemare, J., G. Motzkin, and D. R. Foster. 2002. Legacies of the agricultural past in the forested present: An assessment of historical land-use effects on rich mesic forests. *Journal of Biogeography* 29:1401-1420.
- Curtis, J. T. 1959. The vegetation of Wisconsin: An ordination of plant communities. Reprinted in 1987. University of Wisconsin Press, Madison. 657 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Faber-Langendoen, D., and S. Menard. 2006. A key to eastern forests of the United States: Macrogroups, groups, and alliances. September 15, 2006. NatureServe, Arlington, VA.
- NatureServe. No date. International Ecological Classification Standard: International Vegetation Classification. Central Databases. NatureServe, Arlington, VA.
- Singleton, R., S. Gardescu, P. L. Marks, and M. A. Geber. 2001. Forest herb colonization of postagricultural forests in central New York State, USA. *Journal of Ecology* 89:325-338.

Wright, J. P., and J. D. Fridley. 2010. Biogeographic synthesis of secondary succession rates in eastern North America. *Journal of Biogeography* 37:1584-1596.

1. Forest & Woodland

1.B.2.Na. Eastern North American Forest & Woodland

G032. Eastern North American Exotic Ruderal Forest

Type Concept Sentence: This ruderal forest group is dominated by exotic tree species that establish on former agricultural or forest plantation sites, or on degraded native forest sites, in the cool temperate regions of the eastern United States and Canada.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.B.2.Na.90. Eastern North American Ruderal Forest (M013)

Elcode: G032

***Scientific Name:** *Acer platanoides* - *Robinia pseudoacacia* - *Pinus sylvestris* Exotic Ruderal Forest Group

***Common (Translated Scientific) Name:** Norway Maple - Black Locust - Scotch Pine Exotic Ruderal Forest Group

***Colloquial Name:** Eastern North American Exotic Ruderal Forest

***Type Concept:** This native ruderal forest group is found in the cool temperate regions of the eastern United States and Canada, from the East Coast, west to the Great Lakes and Tallgrass Prairie region and south to the south-central United States. The vegetation of this group shows evidence of former and heavy human disturbance, particularly to the soils, such as through plowing, grading, skidding, etc., but has otherwise been allowed to succeed more-or-less spontaneously. The vegetation is a disparate mix of exotic species, and the ecological and floristic organization of the vegetation is not clear. The tree layer is dominated (>80% cover) by exotic tree species. The list of exotic tree species include Conifers: *Pinus thunbergii* and Hardwoods: *Acer platanoides*, *Ailanthus altissima*, *Malus fusca*, and *Robinia pseudoacacia*. Although *Robinia pseudoacacia* is a native in the central hardwoods region, it is so widely planted outside of its range that it is exotic in character. Understory shrub and herb species vary from exotic invasives to native generalists. Invasive shrub species include a variety of honeysuckles (*Lonicera japonica*, *Lonicera morrowii*, *Lonicera tatarica*, *Lonicera x bella*), *Rhamnus cathartica*, and others. The most common exotic tree species found in abandoned plantations include *Larix decidua*, *Picea abies*, and *Pinus sylvestris*. Sites are often on dry-mesic to wet-mesic sites, suitable for agriculture or forest plantations.

***Diagnostic Characteristics:** A specified list of exotic species [see Floristics] form mono-dominant stands and typically have associated shrub and herb layers that contain generalist native or exotic species. The exotics are >80% (>90%?) of the canopy. Sites may show evidence of former and heavy human use as either agricultural fields or plantations. The most common exotics species found in abandoned plantations include *Larix decidua*, *Picea abies*, and *Pinus sylvestris*. Regeneration of tree species, if present at all, rarely consists of the current overstory, and understory shrub and herb species are often native generalists or exotics.

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G029	Southeastern Exotic Ruderal Forest	
G031	Southeastern Native Ruderal Forest	
G030	Eastern North American Native Ruderal Forest	
G059	Eastern North American Ruderal Meadow & Shrubland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: This group includes spontaneously formed exotic tree-dominated stands, with irregular structure, or abandoned forest plantations, which may still show some evidence of row planting. Dominant trees may be hardwood or conifer.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: The tree layer is dominated (>80% cover) by exotic tree species. The list of exotic tree species include Conifers: *Pinus thunbergii* and Hardwoods: *Acer platanoides*, *Ailanthus altissima*, *Malus fusca*, and *Robinia pseudoacacia*. Although *Robinia pseudoacacia* is a native in the central hardwoods region, it is so widely planted outside of its range that it is exotic in character. Understory shrub and herb species vary from exotic invasives to native generalists. Invasive shrub species include a variety of honeysuckles (*Lonicera japonica*, *Lonicera morrowii*, *Lonicera tatarica*, *Lonicera x bella*), *Rhamnus cathartica*, and others. Sites show evidence of former and heavy human use, particularly with extensive and intensive soil disturbances, including plowing, grading, skidding, etc. The most common exotic tree species found in abandoned plantations include *Larix decidua*, *Picea abies*, and *Pinus sylvestris*. They may be mixed with native tree species, including *Picea glauca*, *Pinus banksiana*, *Pinus resinosa*, *Pinus strobus*, and *Pinus virginiana*, particularly when these stands form from abandoned plantations.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Const-ancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Stands most typically represent the tree-dominated stage in the development of vegetation on sites that were heavily disturbed by humans, including plowing, grading, skidding, etc. In these cases, earlier stages of vegetation include annual and perennial weeds, grasslands and shrublands [see ~Eastern North American Ruderal Meadow & Shrubland Group (G059)\$\$. Because the extensive soil disturbances typically lead to a mix of weedy native and exotic shrub and herb species, the stands take on a ruderal composition. Exotic tree species may initiate establishment before natives or outcompete natives. Canopy cover may be as low as 10%, but eventually stands may have more-or-less continuous canopy, leading to a shift to a more shade-tolerant ground layer. The successional stages of this type have been described in many studies, particularly the early stages of tree invasion into old fields (e.g., Singleton et al. 2001). See also Wright and Fridley (2010) for the biogeographic variation among stands of this type.

This type may also form in other ways. First, exotic forest plantation stands (tracked in 7. ~Agricultural & Developed Vegetation Cultural Class (CCL01)\$)\$) could become exotic ruderal stands if not intensively managed and the planted trees begin to die out. But because exotic planted trees only rarely regenerate on sites where they are planted, these stands more typically are invaded by native generalist trees and succeed to ~Eastern North American Native Ruderal Forest Group (G030)\$\$. Second, native forest stands that have not been plowed or planted may be stressed to the point where the characteristic native combination of species is altered (Curtis 1959). These stands are probably best tracked as altered variants of native types until the overstory itself is substantially altered to the point where exotics tree species are the dominant.

ENVIRONMENT

Environmental Description: Sites include uplands and marginally wet sites that have been altered by logging, clearing for agriculture or other activities. Sites are often on dry-mesic to wet-mesic sites, suitable for agriculture or forest plantations.

DISTRIBUTION

***Geographic Range:** This native ruderal forest group is found in the cool temperate regions of the eastern United States and Canada, from the East Coast, west to the Great Lakes and Tallgrass Prairie region and south to the south-central United States.

Nations: CA, US

States/Provinces: AR, CT, DC, DE, IA, IL, IN, KS, KY, MA, MB?, MD, ME, MI, MN, MO, NB, NC?, ND, NE, NF, NH, NJ, NS, NY, OH, ON, PA, PE, QC, RI, SC?, SD, TN, VA, VT, WI, WV

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3230	<i>Acer platanoides</i> - <i>Ailanthus altissima</i> - <i>Pinus</i> spp. Exotic Ruderal Forest Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: D. Faber-Langendoen and S. Menard (2006)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: D. Faber-Langendoen

Acknowledgments [optional]:

Version Date: 05 May 2015

REFERENCES

*References [Required if used in text]:

- Curtis, J. T. 1959. The vegetation of Wisconsin: An ordination of plant communities. Reprinted in 1987. University of Wisconsin Press, Madison. 657 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Faber-Langendoen, D., and S. Menard. 2006. A key to eastern forests of the United States: Macrogroups, groups, and alliances. September 15, 2006. NatureServe, Arlington, VA.
- NatureServe. No date. International Ecological Classification Standard: International Vegetation Classification. Central Databases. NatureServe, Arlington, VA.
- Singleton, R., S. Gardescu, P. L. Marks, and M. A. Geber. 2001. Forest herb colonization of postagricultural forests in central New York State, USA. *Journal of Ecology* 89:325-338.
- Wright, J. P., and J. D. Fridley. 2010. Biogeographic synthesis of secondary succession rates in eastern North America. *Journal of Biogeography* 37:1584-1596.

1.B.2.Nd. Vancouverian Forest & Woodland (D192)

M405. Vancouverian Ruderal Forest

1. Forest & Woodland

1.B.2.Nd. Vancouverian Forest & Woodland

G801. Vancouverian Ruderal Forest

Type Concept Sentence: This group covers naturalized stands of non-native tree species that have escaped from cultivation, reside in abandoned plantations, were deliberately planted or have otherwise become naturalized on upland sites; dominant species include *Acer platanoides*, *Crataegus arborea*, *Ilex aquifolium*, *Ilex crenata*, *Pinus nigra*, *Pinus sylvestris*, or *Prunus padus*.

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 1.B.2.Nd.90. Vancouverian Ruderal Forest (M405)

Elcode: G801

***Scientific Name:** Vancouverian Ruderal Forest Group

***Common (Translated Scientific) Name:** Vancouverian Ruderal Forest Group

***Colloquial Name:** Vancouverian Ruderal Forest

***Type Concept:** This group consists of stands of non-native tree species that have escaped cultivation, dominate abandoned plantations or have otherwise become naturalized. These stands are not abundant or even common but they are certainly present and may increase with climate warming and further human disturbances across the landscape. Species include *Acer platanoides*, *Crataegus arborea*, *Ilex aquifolium*, *Ilex crenata*, *Pinus nigra*, *Pinus sylvestris*, or *Prunus padus*. Habitats range from sand dunes to old fields, often are present due to some type of severe disturbance or deliberate planting. Most stands are near current or past human habitations. They occur in Oregon, Washington, British Columbia and possibly Alaska.

***Diagnostic Characteristics:**

***Classification Comments:** Currently, this type is limited to stands dominated by non-native tree species. But the concept of ruderal forests could include old-field or other sites with severe soil disturbance that may have a ground layer of exotic shrubs and herbs with a generalist or "weedy" native overstory.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: No information is available other than dominance in the upper canopy by non-native tree species which may include *Acer platanoides*, *Crataegus arborea*, *Ilex aquifolium*, *Ilex crenata*, *Pinus nigra*, *Pinus sylvestris*, and *Prunus padus*, among others.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description: These forests are uncommon in the Pacific Northwest. They can occur on various upland soil conditions. In Oregon, *Pinus nigra* and *Pinus sylvestris* occur on sand dunes and were planted as a soil erosion measure. In Washington and British Columbia, small stands of various species occur near human habitation.

DISTRIBUTION

***Geographic Range:** This group occurs in Oregon, Washington and British Columbia and is assumed to also occur in Alaska, but its existence there has not yet been confirmed.

Nations: CA, US

States/Provinces: AK?, BC, OR, WA

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]:

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: G. Kittel

Acknowledgments [optional]:

Version Date: 03 Dec 2014

REFERENCES

*References [Required if used in text]:

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

1.B.3.Na. Eastern North American-Great Plains Flooded & Swamp Forest (D011)

M302. Eastern North American Ruderal Flooded & Swamp Forest

1. Forest & Woodland

1.B.3.Na. Eastern North American-Great Plains Flooded & Swamp Forest

G552. Eastern North American Ruderal Flooded & Swamp Forest

Type Concept Sentence: This group consists of forested wetlands found throughout much of the eastern half of the United States and southern Canada with weedy native dominant trees such as *Acer negundo*, *Acer rubrum*, *Acer saccharinum*, *Fraxinus pennsylvanica*, *Ostrya virginiana*, *Populus balsamifera*, *Prunus serotina*, and/or *Salix* spp. The understory is heavily invaded by exotic or invasive native shrub and herbaceous species.

OVERVIEW

*Hierarchy Level: Group

***Placement in Hierarchy:** 1.B.3.Na.90. Eastern North American Ruderal Flooded & Swamp Forest (M302)

Elcode: G552

***Scientific Name:** *Acer rubrum* - *Fraxinus pennsylvanica* - *Acer negundo* Ruderal Flooded & Swamp Forest Group

***Common (Translated Scientific) Name:** Red Maple - Green Ash - Box-elder Ruderal Flooded & Swamp Forest Group

***Colloquial Name:** Eastern North American Ruderal Flooded & Swamp Forest

***Type Concept:** This group consists of forested wetlands throughout much of the eastern half of the United States and southern Canada north of Virginia, Tennessee, and Arkansas and east of the Great Plains. Sites where these forests are found have been extensively affected by disturbance such as logging, agricultural use, or a large change in the hydrologic regime. Sites are in depressional wetlands or along the edges of ponds, lakes or rivers. Dominant trees are early-successional native species adapted to wet conditions, especially *Acer negundo* (exotic in some parts of the range), *Acer rubrum*, *Acer saccharinum*, *Fraxinus pennsylvanica*, *Ostrya virginiana*, *Populus balsamifera*, *Prunus serotina*, and *Salix* spp. Northward *Picea glauca* is an occasional dominant. The understory is heavily invaded by exotic or invasive native shrub and herbaceous species, including exotics such as *Frangula alnus* (= *Rhamnus frangula*), *Rhamnus cathartica*, *Rosa multiflora* (mostly in open floodplains), *Berberis thunbergii* (mostly in floodplains and temporarily flooded swamps), *Ligustrum sinense*, and *Ligustrum vulgare* with occasional generalist native species such as *Cornus amomum* and *Cornus sericea*. Herbaceous exotics include *Alliaria petiolata* (mostly in floodplains), *Barbarea vulgaris*, *Galeopsis* spp., *Glechoma hederacea*, *Hesperis matronalis*, *Hylotelephium telephium*, *Lysimachia nummularia*, *Microstegium vimineum* (more in floodplains but also basin wetlands), *Myosotis scorpioides*, *Phalaris arundinacea*, *Phlox paniculata*, *Phragmites australis*, and many others. They may be mixed with very generalist native herbaceous species such as *Calamagrostis canadensis*, *Cirsium* spp., *Eupatorium* spp., *Galium* spp., *Geum canadense*, *Glyceria striata*, *Impatiens capensis*, *Leersia oryzoides*, *Solidago canadensis*, and *Solidago rugosa*.

***Diagnostic Characteristics:** This group includes wetland forests in the eastern United States and southern Canada that have experienced significant hydrologic or soil profile disturbance or that have been overtaken by exotic species even in the absence of disturbance. This group is distinguished by having an uneven physiognomy (canopy height, canopy cover) and an understory strongly dominated by exotic and/or invasive native plants. Dominance of these species in the understory is at least 80% relative cover. A few generalist native species dominate the canopy, including *Acer rubrum*, *Fraxinus pennsylvanica*, and *Acer negundo*.

***Classification Comments:** The current nominal species are also common in some natural/ruderal swamps. This group is distinguished by having an uneven physiognomy (canopy height, canopy cover) and an understory strongly dominated by exotic and/or invasive native plants.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G045	Laurentian-Acadian-Appalachian Acidic Swamp	
G553	Southeastern Native Ruderal Flooded & Swamp Forest	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: These are tree-dominated wetland forests, but stands can vary from moderately open to closed (25-100% cover) and from short to tall trees. Most stands have a patchy tree canopy and thickets of shrubs. Sites that are recovering from recent extensive disturbance usually have short, young trees and an open canopy with a denser understory. Sites that have not had recent extensive disturbance will have taller trees and a moderately closed to closed canopy. The understory in these stands usually thins out due to less light availability, but even most older stands in this wetland forest allow substantial light to penetrate the canopy. A moderate to vigorous shrub and tree sapling layer is typical. The herbaceous layer is extremely variable in cover but tends to have at least moderate cover due to the available light reaching the forest floor.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This group can have a wide variety of native and non-native species. Species composition varies with time since and nature of disturbance, available seed sources, and habitat characteristics, but common dominants in the tree strata are *Acer negundo* (exotic in some parts of the range), *Acer rubrum*, *Acer saccharinum*, *Fraxinus pennsylvanica*, *Ostrya virginiana*, *Populus balsamifera*, *Prunus serotina*, and *Salix* spp. Northward *Picea glauca* is an occasional dominant. The understory is heavily invaded by

exotic or invasive native shrub and herbaceous species, including exotics such as *Frangula alnus* (= *Rhamnus frangula*), *Rhamnus cathartica*, *Rosa multiflora* (mostly in open floodplains), *Berberis thunbergii* (mostly in floodplains and temporarily flooded swamps), *Ligustrum sinense*, and *Ligustrum vulgare* with occasional generalist native species such as *Cornus amomum* and *Cornus sericea*. Herbaceous exotics include *Alliaria petiolata* (mostly in floodplains), *Barbarea vulgaris*, *Galeopsis* spp., *Glechoma hederacea*, *Hesperis matronalis*, *Hylotelephium telephium*, *Lysimachia nummularia*, *Microstegium vimineum* (more in floodplains but also basin wetlands), *Myosotis scorpioides*, *Phalaris arundinacea*, *Phlox paniculata*, *Phragmites australis*, and many others. They may be mixed with very generalist native herbaceous species such as *Calamagrostis canadensis*, *Cirsium* spp., *Eupatorium* spp., *Galium* spp., *Geum canadense*, *Glyceria striata*, *Impatiens capensis*, *Leersia oryzoides*, *Solidago canadensis*, and *Solidago rugosa*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: These wetland forests are more likely than natural/ruderal forests to be affected by further anthropogenic disturbances. This can include logging or tree clearing of some sort, manipulation of hydrology, continued introduction of seeds of exotic species, etc. In addition, the normal dynamics common to wetland forests can affect examples of this group. Years of higher or lower than normal precipitation, windthrow, and disease can all affect the composition and physiognomy.

ENVIRONMENT

Environmental Description: This group is found on mineral soils or shallow peat (<30 cm) that are flooded for some or all of the growing season. Soils range from coarse (often alluvial soils) to fine-textured.

DISTRIBUTION

***Geographic Range:** These forested wetlands are found throughout much of the eastern half of the United States and southern Canada north of a line from Virginia to Arkansas and east of the Great Plains.

Nations: CA, US

States/Provinces: CT, DC, DE, IA, IL, IN, KY, MA, MD, ME, MI, MN, MO, NB, NH, NJ, NS, NY, OH, ON, PA, PE, QC, RI, VA, VT, WI, WV

USFS Ecoregions (2007) [optional]: 211A:C, 211B:CC, 211C:CC, 211D:CC, 211E:CC, 211F:CC, 211I:CP, 211J:CC, 212H:CC, 212J:CC, 212K:CC, 212L:CC, 212M:CC, 212N:CC, 221A:CC, 221E:CC, 221F:CC, 221H:CC, 222H:CC, 222I:CC, 222J:CC, 222K:CC, 222L:CC, 222M:CC, 222N:CP, 223A:CC, 223D:CC, 223E:CC, 223F:CC, 223G:CC, 231A:CC, 231H:CC, 232A:CC, 232B:CC, 232C:CC, 251C:CC, 251D:CC, 251E:CP, M211A:CP, M211B:CP, M211C:CP, M211D:CP, M221A:CP, M221B:CP, M221C:CP, M221D:CP

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4099	<i>Acer negundo</i> - <i>Betula nigra</i> / <i>Alliaria petiolata</i> Ruderal Floodplain Forest Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: J. Drake, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: J. Drake and D. Faber-Langendoen

Acknowledgments [optional]: Scott Franklin, Sean Basquill

Version Date: 05 Jun 2015

REFERENCES

*References [Required if used in text]:

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1.B.3.Nb. Southeastern North American Flooded & Swamp Forest (D062)

M310. Southeastern North American Ruderal Flooded & Swamp Forest

1. Forest & Woodland

1.B.3.Nb. Southeastern North American Flooded & Swamp Forest

G553. Southeastern Native Ruderal Flooded & Swamp Forest

Type Concept Sentence: This forest group represents vegetation growing on wetland sites which have been subjected to anthropogenic disturbance and are dominated by native trees which are characteristic of disturbed wetland sites (i.e., *Acer rubrum*, *Celtis laevigata*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Pinus taeda*).

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 1.B.3.Nb.90. Southeastern North American Ruderal Flooded & Swamp Forest (M310)

Elcode: G553

*Scientific Name: *Acer rubrum* - *Pinus taeda* - *Liquidambar styraciflua* Ruderal Flooded & Swamp Forest Group

*Common (Translated Scientific) Name: Red Maple - Loblolly Pine - Sweetgum Ruderal Flooded & Swamp Forest Group

*Colloquial Name: Southeastern Native Ruderal Flooded & Swamp Forest

*Type Concept: This forest group represents vegetation growing on wetland sites which have been subjected to anthropogenic disturbance and are dominated by native trees which are characteristic of disturbed wetland sites, such as *Acer rubrum*, *Celtis laevigata*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, and *Pinus taeda*. Managed tree plantations are not included here, except for planted stands which are not managed and have become mixed with other trees. This group does not include stands managed as monocultures of one tree species, for forestry or in orchards. Wetland forests are subject to natural disturbances such as flooding, tornados, and hurricanes. Successional forests in functioning natural landscapes may regenerate following natural disturbances; those forests are not considered ruderal and are not included here.

*Diagnostic Characteristics: These are anthropogenically disturbed (i.e., disturbed by human activity), ruderal wetland forests of the south-central and southeastern United States. *Acer rubrum* and *Liquidambar styraciflua* are typical codominant trees, but the group is floristically variable and lacks diagnostic tree species which can be used for all sites.

***Classification Comments:** The similar NVC types listed include floristically similar but not ruderal forest vegetation found in wetlands of the south-central and southeastern United States. This group concept may be original, a literature review is needed to confirm this.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G190	Wet-Mesic Longleaf Pine Open Woodland	is dominated by <i>Pinus palustris</i> , or <i>Pinus palustris</i> and <i>Pinus elliotii</i> , not by <i>Pinus taeda</i> .
G552	Eastern North American Ruderal Flooded & Swamp Forest	occurs further north, in the cool temperate climate region.
G762	Southeastern Exotic Ruderal Flooded & Swamp Forest	is dominated by exotic trees such as <i>Triadica sebifera</i> , <i>Schinus terebinthifolius</i> , and <i>Melaleuca quinquenervia</i> .
G034	Oak - Sweetgum Floodplain Forest	has significant <i>Quercus</i> spp. component of the tree canopy and usually regeneration.
G037	Coastal Plain Mixed Evergreen Swamp	
G038	Coastal Plain Hardwood Basin Swamp	
G033	Bald-cypress - Tupelo Floodplain Forest	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Usually these forests are of mixed deciduous and evergreen physiognomy.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: These forests are dominated by trees which are characteristic of disturbed wetland sites (i.e., *Acer rubrum*, *Celtis laevigata*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, *Pinus taeda*).

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Many stands of these forests are the result of succession on previously cleared sites, including formerly agricultural land. These forests are prone to the same natural disturbances typical of wetlands in the southeastern United States: flooding (which may be severe), tornados, hurricanes, drought, and in some instances wildland fire (during drought conditions). Freezing temperatures do occur in winter as far south as southern Florida, and many of the ruderal wetland forests there show dominance or codominance of *Acer rubrum*. Many forests which were initiated as tree plantations, but have been subject to severe natural disturbance belong in this group. Also here are stands initiated as tree plantations which have become codominated by other tree species which have naturally persisted or dispersed and regenerated into a stand, and where the stand is not presently intensively managed as a tree plantation.

ENVIRONMENT

Environmental Description: This group occurs in areas prone to flooding, such as along rivers and creeks, or on hydric soil flats which may be extensive and poorly drained. *Climate:* Warm temperate. *Soil/substrate/hydrology:* Generally occurs on hydric soils, or on bottomland and other soils on flats and depressions which are prone to some flooding (but are not hydric).

DISTRIBUTION

***Geographic Range:** This group is found in warm temperate areas in the south-central and southeastern United States, from Virginia to Florida, west to Arkansas and Texas.

Nations: US

States/Provinces: AL, AR, FL, GA, LA, MD, MS, NC?, OK, SC, TN, TX, VA, WV

USFS Ecoregions (2007) [optional]: 231:C, 232:C, 234:C, 255:C, 315:C

Omernik Ecoregions L3, L4 [optional]: 8.3.1.64:C, 8.3.3.71:?, 8.3.4.45:C, 8.3.5.65:C, 8.3.6.74:C, 8.3.7.35:C, 8.3.8.33:C, 8.4.1.67:C, 8.4.4.66:?, 8.4.7.37:?, 8.4.8.36:?, 8.4.9.68:C, 8.5.1.63:C, 8.5.2.73:C, 8.5.3.75:C, 9.4.6.30:C, 9.4.7.32:C, 9.5.1.34:C

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3344	<i>Prosopis glandulosa</i> - <i>Ulmus crassifolia</i> Ruderal Flooded & Swamp Woodland Alliance
A3343	<i>Acer rubrum</i> - <i>Liriodendron tulipifera</i> Ruderal Flooded & Swamp Forest Alliance
A3345	<i>Pinus taeda</i> - <i>Liquidambar styraciflua</i> Ruderal Flooded & Swamp Forest Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	Sweetgum - Yellow-Poplar: 87	Eyre 1980	
><	Sweetgum - Willow Oak: 92	Eyre 1980	
><	Loblolly Pine - Hardwood: 82	Eyre 1980	

AUTHORSHIP

***Primary Concept Source [if applicable]:** C. Nordman, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** C. Nordman

Acknowledgments [optional]:

Version Date: 13 May 2015

REFERENCES

***References [Required if used in text]:**

Eyre, F. H., editor. 1980. Forest cover types of the United States and Canada. Society of American Foresters, Washington, DC. 148 pp.
 Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

1. Forest & Woodland

1.B.3.Nb. Southeastern North American Flooded & Swamp Forest

G762. Southeastern Exotic Ruderal Flooded & Swamp Forest

Type Concept Sentence: These are wetland forests dominated by invasive exotic trees such as *Triadica sebifera*, *Schinus terebinthifolius*, and *Melaleuca quinquenervia*, which occur in the southeastern United States, especially Florida, Louisiana and eastern Texas.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.B.3.Nb.90. Southeastern North American Ruderal Flooded & Swamp Forest (M310)

Elcode: G762

***Scientific Name:** Southeastern Exotic Ruderal Flooded & Swamp Forest Group

***Common (Translated Scientific) Name:** Southeastern Exotic Ruderal Flooded & Swamp Forest Group

***Colloquial Name:** Southeastern Exotic Ruderal Flooded & Swamp Forest

***Type Concept:** These forests occupy wetland sites which may not have been subject to anthropogenic disturbance but have become dominated by invasive exotic trees such as *Triadica sebifera*, *Schinus terebinthifolius*, and *Melaleuca quinquenervia*. Other invasive exotic trees and shrubs may be common, such as *Ligustrum sinense*.

***Diagnostic Characteristics:** Stands are bottomlands, floodplains, wet flats, depressions and other wetlands dominated by invasive exotic trees such as *Triadica sebifera*, *Schinus terebinthifolius*, and *Melaleuca quinquenervia*. Other invasive exotic trees and shrubs may be common, such as *Ligustrum sinense*.

***Classification Comments:** This group has been split from ~Southeastern Native Ruderal Flooded & Swamp Forest Group (G553)\$.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G553	Southeastern Native Ruderal Flooded & Swamp Forest	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: These are evergreen, deciduous, or mixed evergreen and deciduous broad-leaved forests. *Schinus terebinthifolius* and *Melaleuca quinquenervia* are evergreen and are common in the Florida Peninsula. Some forests may have a deciduous canopy of *Triadica sebifera* and an evergreen tall-shrub stratum of *Ligustrum sinense*, but often *Triadica sebifera* is dominant, but mixed with native deciduous trees, shrubs, graminoids and forbs.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Stands are dominated by invasive exotic trees or tall shrubs, such as *Triadica sebifera*, *Schinus terebinthifolius*, and *Melaleuca quinquenervia*. *Triadica sebifera* stands may have an evergreen tall-shrub stratum of *Ligustrum sinense*, but often *Triadica sebifera* is dominant, but mixed with native deciduous trees, shrubs, graminoids and forbs. In more open stands of *Melaleuca quinquenervia* in southern Florida, *Cladium mariscus ssp. jamaicense* may be an herbaceous stratum dominant. There are a variety of other ruderal native and exotic trees which may occur in these wetlands.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: This vegetation is spreading, aided by bird dispersal of seeds of *Triadica sebifera* and *Schinus terebinthifolius*, and wind and water dispersal of seeds of *Melaleuca quinquenervia*. While fire provides some control of *Triadica sebifera* in the Gulf Coastal

Prairies region, in southwest Florida fire promotes the dispersal of *Melaleuca quinquenervia* seeds. These invasive exotic trees easily reproduce and thrive in southern wetlands, and are spreading. It has been estimated that the range of *Triadica sebifera* will increase to 1.58 million hectares (3.8 million acres) by 2023; its spread is being increased by hurricane and feral hog damage to native forests (Wang et al. 2011), and by forest management practices (Fan et al. 2012). *Melaleuca quinquenervia* transpires large amounts of water, and was widely planted in southern Florida in order to dry out wetlands. *Schinus terebinthifolius* and *Melaleuca quinquenervia* are sensitive to cold, which has limited their northward spread.

ENVIRONMENT

Environmental Description: Sites are bottomlands, floodplains, wet flats, depressions and other wetlands which have become dominated by invasive exotic trees. *Triadica sebifera* is especially common in the former Gulf Coastal Prairies from southern Mississippi to Louisiana and east Texas. *Schinus terebinthifolius* and *Melaleuca quinquenervia* are common in a variety of wetlands in the Florida Peninsula, including the Big Cypress area of southwest Florida. *Schinus terebinthifolius* is common in formerly farmed and rock-plowed areas in south Florida. *Triadica sebifera* leaf litter is toxic to amphibians (Saenz et al. 2013) and can change natural forest conditions (Fan et al. 2012).

DISTRIBUTION

***Geographic Range:** *Schinus terebinthifolius* and *Melaleuca quinquenervia* are naturalized in the Florida Peninsula, *Schinus terebinthifolius* also occurs along the southern coast of Texas. *Triadica sebifera* is naturalized and very common in the Gulf Coastal Prairies region of Texas, Louisiana and southern Mississippi. It also occurs near the coast and in wetlands of Alabama, Florida, and as far north as North Carolina.

Nations: US

States/Provinces: AL, AR, FL, GA, LA, MS, NC, SC, TN, TX

USFS Ecoregions (2007) [optional]: 231:C, 232:C, 234:C, 255:C, 411:C

Omernik Ecoregions L3, L4 [optional]: 8.3.4.45:C, 8.3.5.65:C, 8.3.6.74:C, 8.3.7.35:C, 8.3.8.33:C, 8.4.1.67:?, 8.4.7.37:?, 8.4.8.36:?, 8.4.9.68:?, 8.5.1.63:C, 8.5.2.73:C, 8.5.3.75:C, 9.4.5.29:?, 9.4.7.32:C, 9.5.1.34:C, 15.4.1.76:C

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3339	<i>Triadica sebifera</i> - <i>Melaleuca quinquenervia</i> - <i>Schinus terebinthifolius</i> Ruderal Flooded & Swamp Forest Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
>	Invasive exotic monoculture	FNAI 2010b	
<	Brazilian Pepper Monoculture	Hilsenbeck et al. 1979	

AUTHORSHIP

***Primary Concept Source [if applicable]:** C.W. Nordman, in Faber-Langendoen et al. (2015)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** C.W. Nordman

Acknowledgments [optional]: We acknowledge the many researchers and agency personnel who have helped to increase our understanding of the threats posed by invasive exotic trees in wetlands of the southern United States.

Version Date: 13 May 2015

REFERENCES

***References [Required if used in text]:**

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Saenz, D., E. M. Fucik, and M. A. Kwiatkowski. 2013. Synergistic effects of the invasive Chinese tallow (*Triadica sebifera*) and climate change on aquatic amphibian survival. *Ecology and Evolution* 3(14):4828-4840.

Wang, H., W. E. Grant, T. M. Swannack, J. Gan, W. E. Rogers, T. E. Koralewski, J. H. Miller and J. W. Taylor, Jr. 2011. Predicted range expansion of Chinese tallow tree (*Triadica sebifera*) in forestlands of the southern United States. *Diversity and Distributions* 17:552-565.

1.B.3.Nd. Western North American Interior Flooded Forest (D013)

M298. Interior West Ruderal Flooded & Swamp Forest & Woodland

1. Forest & Woodland

1.B.3.Nd. Western North American Interior Flooded Forest

G510. Interior West Ruderal Riparian Forest & Scrub

Type Concept Sentence: Stands of *Tamarix* spp., *Elaeagnus angustifolia*, or other introduced facultative wet-tolerant species in low-elevation riparian areas throughout the western U.S. and into Mexico.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 1.B.3.Nd.90. Interior West Ruderal Flooded & Swamp Forest & Woodland (M298)

Elcode: G510

***Scientific Name:** *Tamarix* spp. - *Elaeagnus angustifolia* Ruderal Riparian Forest & Scrub Group

***Common (Translated Scientific) Name:** Tamarisk species - Russian-olive Ruderal Riparian Forest & Scrub Group

***Colloquial Name:** Interior West Ruderal Riparian Forest & Scrub

***Type Concept:** This group consists of low-elevation riparian areas, seeps and springs throughout the southwestern U.S. and into Mexico that are dominated by non-native invasive woody species. Present to abundant species include *Elaeagnus angustifolia*, *Myoporum laetum*, *Phoenix canariensis*, *Prunus mahaleb*, *Robinia pseudoacacia*, *Schinus molle*, *Schinus terebinthifolius*, *Tamarix* spp., *Ulmus pumila*, or *Washingtonia robusta*. Salt-cedar habitats tend to support fewer species and individuals than native habitats. If present, native species contribute less than 10% relative cover. Elevation ranges from sea level to above 2135 m (7000 feet). Sites are typically streambanks and benches, floodplains and canyons with permanent, intermittent or temporary waterflow.

***Diagnostic Characteristics:** Tall, deciduous trees dominated by naturalized, invasive species not considered native to North America or, if native to North America, naturalized beyond their native ranges.

***Classification Comments:** The name is "scrub" rather than forest or woodland to capture lower heights and more open canopy densities and the fact that some dominant species are multi-stemmed and may not meet "forest" or "woodland" criteria. Planted

stands of *Washingtonia robusta*, *Washingtonia filifera*, and *Phoenix canariensis* are not part of this group but would be considered "cultural" vegetation. *Washingtonia robusta* is native to Mexico, so only naturalized stands within the U.S. belong to this group.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G797	Western Interior Riparian Forest & Woodland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Open- to closed-canopy riparian woodlands that can have a scrubby appearance (multi-stemmed, 1-20 m tall) dominated by non-native woody species, generally following linear paths of adjacent streams, rivers and floodplains.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Present to abundant species include *Elaeagnus angustifolia*, *Myoporum laetum*, *Phoenix canariensis*, *Prunus mahaleb*, *Robinia pseudoacacia*, *Schinus molle*, *Schinus terebinthifolius*, *Tamarix* spp., *Ulmus pumila*, or *Washingtonia robusta*. Some of these are not necessarily restricted to riparian/wetland settings. Salt-cedar habitats tend to support fewer species and individuals than native habitats (Smith and Douglas 1989, Barbour et al. 2007, Sogge et al. 2008, Sawyer et al. 2009). Non-native understory species may include *Acroptilon repens*, *Aegilops* sp., *Agrostis gigantea*, *Agrostis stolonifera*, *Alopecurus geniculatus*, *Alopecurus pratensis*, *Arundo donax*, *Conyza canadensis*, *Cirsium arvense*, *Echinochloa crus-galli*, *Eichhornia crassipes*, *Hordeum murinum*, *Phalaris arundinacea*, *Phleum pratense*, *Phragmites australis*, *Poa palustris*, *Poa pratensis*, *Rumex crispus*, and *Sonchus arvensis*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description: Elevation ranges from sea level to above 2135 m (7000 feet). *Climate:* Warm Temperate.

Soil/substrate/hydrology: Sites are typically alluvial streambanks and floodplains, with slightly alkaline soils and water heavy in agricultural runoff (Smith and Douglas 1989, Barbour et al. 2007, Sogge et al. 2008, Sawyer et al. 2009).

DISTRIBUTION

***Geographic Range:** This group is found throughout the western interior of the U.S. and into Mexico.

Nations: MX, US

States/Provinces: AZ, CA, ID, NM, NV, OK, TX

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4160	<i>Rubus armeniacus</i> - <i>Sesbania punicea</i> - <i>Ficus carica</i> Ruderal Riparian Scrub Alliance
A4155	<i>Acer negundo</i> - <i>Populus</i> spp. - <i>Picea</i> spp. Ruderal Riparian Forest Alliance

Elcode	Scientific or Colloquial Name
A4161	<i>Phoenix dactylifera</i> - <i>Washingtonia filifera</i> Ruderal Riparian Woodland Alliance
A4218	<i>Prosopis</i> spp. Lowland Ruderal Understory Wet Scrub Alliance
A3566	<i>Elaeagnus angustifolia</i> Ruderal Riparian Scrub Alliance
A0842	<i>Tamarix</i> spp. Ruderal Riparian Scrub Alliance
A4192	<i>Salix alba</i> - <i>Salix fragilis</i> Ruderal Riparian Forest Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: K.A. Schulz, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: G. Kittel

Acknowledgments [optional]:

Version Date: 11 May 2015

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2.A.1.Ea. Caribbean-Mesoamerican Lowland Grassland, Savanna & Shrubland (D094)

M515. Caribbean-Mesoamerican Lowland Ruderal Grassland & Shrubland

2. Shrub & Herb Vegetation

2.A.1.Ea. Caribbean-Mesoamerican Lowland Grassland, Savanna & Shrubland

G684. Caribbean-Mesoamerican Lowland Ruderal Grassland & Shrubland

Type Concept Sentence: These ruderal grasslands and shrublands include weedy pastures with exotic grasses, scattered small trees and shrubs which occur on a variety of disturbed sites in southern Mexico, Central America, and the Caribbean.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.A.1.Ea.90. Caribbean-Mesoamerican Lowland Ruderal Grassland & Shrubland (M515)

Elcode: G684

***Scientific Name:** Caribbean-Mesoamerican Lowland Ruderal Grassland & Shrubland Group

***Common (Translated Scientific) Name:** Caribbean-Mesoamerican Lowland Ruderal Grassland & Shrubland Group

***Colloquial Name:** Caribbean-Mesoamerican Lowland Ruderal Grassland & Shrubland

***Type Concept:** This group includes weedy pastures which may be grazed and burned periodically, and may include areas which are shrub-dominated, or with small trees. Without grazing, fire or some other disturbance, succession to young forest may occur in less than ten years. These areas are grass-dominated, including many exotic species, which include *Chloris gayana*, *Digitaria eriantha* ssp. *pentzii* (= *Digitaria decumbens*), *Hyparrhenia rufa*, *Melinis minutiflora*, *Pennisetum clandestinum*, *Pennisetum purpureum*, *Urochloa mutica* (= *Brachiaria mutica*), and *Urochloa maxima* (= *Panicum maximum*). These grasslands occur in southern Mexico, Central America, and the Caribbean.

***Diagnostic Characteristics:** Grasslands dominated by exotic species.

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: This is mostly grassland, but includes some savanna and steppe (graminoid-dominated).

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Dense grasses dominate, with scattered shrub or short tree species reaching 3-5 m high. Some landscapes support a recurring mosaic of open savanna with "islands" of dense forest composed of the tree species found across the more open savanna. The following list of grass species is diagnostic for this group: *Andropogon* spp., *Hyparrhenia rufa*, *Paspalum* spp., and shrubs *Acacia collinsii*, *Vachellia farnesiana* (= *Acacia farnesiana*), *Acoelorrhaphe wrightii*, *Byrsonima crassifolia*, *Cameraria latifolia*, *Crescentia alata*, *Curatella americana*, *Erythroxylum guatemalense*, *Gliricidia sepium*, *Quercus oleoides*, and *Roupala montana*. Some of the most prominent invasive grasses (including many forage grasses) of African origin include *Chloris gayana*, *Digitaria eriantha* ssp. *pentzii* (= *Digitaria decumbens*), *Hyparrhenia rufa*, *Melinis minutiflora*, *Pennisetum clandestinum*, *Pennisetum purpureum*, *Urochloa maxima* (= *Panicum maximum*), and *Urochloa mutica* (= *Brachiaria mutica*) (Williams and Baruch 2000). Additional invasive grass species include *Eragrostis curvula*, *Eragrostis lehmanniana*, *Panicum coloratum*, *Pennisetum ciliare*, and *Melinis repens* (= *Rhynchelytrum repens*) (Williams and Baruch 2000). Many grasses are listed as weeds in Puerto Rico, such as *Andropogon bicornis*, *Arundo donax*, *Bothriochloa bladhii*, *Bothriochloa pertusa*, *Pennisetum ciliare* (= *Cenchrus ciliaris*), *Cenchrus echinatus*, *Cyperus esculentus*, *Paspalum* spp., *Rottboellia cochinchinensis*, and *Sporobolus indicus* (Más and Lugo-Torres 2013). Among the invasive species listed for Puerto Rico and the Virgin Islands, *Antigonon leptopus*, *Epipremnum pinnatum*, *Leucaena leucocephala*, *Oeceoclades maculata*, *Pueraria phaseoloides*, *Spathodea campanulata*, *Syngonium podophyllum*, *Syzygium jambos*, *Thunbergia alata*, *Urochloa maxima* (= *Megathyrsus maximus*), and *Urochloa mutica* are some of the most conspicuous in terms of abundance (Rojas-Sandoval and Acevedo-Rodríguez 2015), and some of the most widespread and damaging invasive trees and shrubs are *Albizia lebeck*, *Leucaena leucocephala*, *Pinus caribaea*, *Spathodea campanulata*, *Syzygium jambos*, *Tabebuia rosea*, and *Terminalia catappa* (Rojas-Sandoval and Acevedo-Rodríguez 2015).

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Frequent or annual burning is a common practice. Sites that are not grazed, burned or periodically disturbed in some way would naturally succeed to young forest, generally initially dominated by a mix of native and exotic trees, but over time native trees mostly will gain dominance (Lugo and Helmer 2004).

ENVIRONMENT

Environmental Description: *Climate:* Occurs in dry to wet tropical climates. *Soil/substrate/hydrology:* Occurs on inland or coastal plateaus, midslopes or toeslopes with soils of various origins and textures, volcanic or sedimentary, alluvial, or clayish (verticos), usually acidic and with low fertility. Most sites are successional, following forest clearing, agriculture, use as pasture, and in some cases abandonment.

DISTRIBUTION

***Geographic Range:** This group is found in southern Mexico, Central America, and the Caribbean Islands.

Nations: BS, BZ, CO, CR, CU, DO, GT, HN, HT, JM, MX, NI, PA, PR, SV, US, VI, XB

States/Provinces: FL

USFS Ecoregions (2007) [optional]:

Omerik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	Puerto Rico land cover type 48, Dry grasslands and pastures	Gould et al. 2008	
<	Puerto Rico land cover type 50, Moist grasslands and pastures	Gould et al. 2008	

AUTHORSHIP

***Primary Concept Source [if applicable]:** C. Josse and C. Nordman, in Faber-Langendoen et al. (2016)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** C. Josse and C. Nordman

Acknowledgments [optional]:

Version Date: 04 Feb 2016

REFERENCES

*References [Required if used in text]:

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2.A.1.OI. Polynesian Lowland Shrubland, Grassland & Savanna (D074)

M220. Polynesian Ruderal Lowland Shrubland, Grassland & Savanna

2. Shrub & Herb Vegetation

2.A.1.OI. Polynesian Lowland Shrubland, Grassland & Savanna

G413. Polynesian Ruderal Lowland Shrubland, Grassland & Savanna

Type Concept Sentence: The Polynesian ruderal lowland dry grassland and shrubland group is characterized by grass or shrub layers dominated by non-native woody species such as *Lantana camara*, *Leucaena leucocephala*, and/or *Schinus terebinthifolius* and non-native herbaceous species such as *Pennisetum setaceum*, *Pennisetum clandestinum*, and *Paspalum vaginatum* with and without a non-native shrub overstory.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.A.1.OI.90. Polynesian Ruderal Lowland Shrubland, Grassland & Savanna (M220)

Elcode: G413

***Scientific Name:** *Leucaena leucocephala* / *Pennisetum* spp. - *Melinis* spp. Polynesian Ruderal Lowland Shrubland, Grassland & Savanna Group

***Common (Translated Scientific) Name:** Koa Haole / Fountaingrass species - Stinkgrass species Polynesian Ruderal Lowland Shrubland, Grassland & Savanna Group

***Colloquial Name:** Polynesian Ruderal Lowland Shrubland, Grassland & Savanna

***Type Concept:** This Polynesian ruderal lowland dry grassland and shrubland group is characterized by grass or shrub layers dominated by non-native species that have become abundant with absence of fire, the introduction of aggressive invasive species and disturbance from changes in land use, such as cattle and feral pig grazing. These non-native grasslands and shrublands have replaced native grasslands and shrublands. Native grasslands were once fairly widespread and were maintained and expanded by regular burning by ancient Hawaiians. Many dry grasslands have been replaced by exotic grass species or converted to exotic shrublands. Stands are dominated by non-native grasses such as *Andropogon virginicus*, *Cynodon dactylon*, *Melinis minutiflora*, *Melinis repens*, *Pennisetum setaceum*, *Pennisetum clandestinum*, *Pennisetum purpureum*, and *Paspalum vaginatum* with and without a non-native shrub overstory. Shrublands can be dominated by the introduced non-natives *Lantana camara*, *Leucaena leucocephala*, and/or *Schinus terebinthifolius*. Native lowland dry shrublands are relatively intolerant to grazing pressure and fire, and are replaced by alien-dominated communities when subjected to these disturbances. Sites range from flat to steep slopes with varying soil depths, as well as rocky cliffs and recent lava flows with sparse to dense coverage, depending on substrate and moisture availability. Elevations extend from sea level to montane zone. Sparsely vegetated rocky cliffs and recent lava flows dominated by non-native species are included in this group because the same species occur as those found in non-sparse stands. The density and height of shrubs may be reduced by recent fire or increased with increased moisture, for example when near riparian areas.

***Diagnostic Characteristics:**

***Classification Comments:** This ruderal group contains all grasslands, shrublands, scrub, savanna, and sparse vegetation that are strongly dominated (>90% relative canopy cover) by non-native shrubs or non-native herbaceous species. This group is most abundant in the more disturbed lowlands, but may extend to the montane zone. This group also includes shrublands with native shrub canopy and an understory so severely degraded that the natural plant community cannot be determined, and community has converted to a ruderal or novel type (usually dominated by non-native species with >90% relative cover).

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Lowland dry grasslands and shrublands characterized by either a grass layer <1 m tall, or an open to closed short-shrub (<2 m tall) layer.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This lowland group is composed of non-native-dominated grasslands, shrublands, savannas and sparse vegetation. Non-native herbaceous species include *Andropogon virginicus*, *Axonopus fissifolius*, *Bothriochloa bladhii*, *Bothriochloa pertusa*, *Cynodon dactylon*, *Dactyloctenium aegyptium*, *Digitaria insularis*, *Hyparrhenia rufa*, *Melinis minutiflora*, *Melinis repens*, *Nephrolepis multiflora*, *Paspalum conjugatum*, *Paspalum vaginatum*, *Pennisetum ciliare*, *Pennisetum clandestinum*, *Pennisetum purpureum*, *Pennisetum setaceum*, *Sacciolepis indica*, *Schizachyrium condensatum*, *Spermacoce assurgens*, *Urochloa maxima*, and/or *Zinnia peruviana*. Scattered to dense layer of shrubs are also included in the group when the shrub layer is dominated by introduced shrub species such as *Lantana camara*, *Leucaena leucocephala*, and/or *Schinus terebinthifolius*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Native grasslands were once fairly widespread and were maintained and expanded by regular burning by ancient Hawaiians. Non-native grasslands have increased the fuel load and consequentially the fire frequency and severity, which is very destructive to most native shrublands and other native vegetation types.

ENVIRONMENT

Environmental Description: This group historically occurred on the leeward side of all the main islands and some of the smaller dry islands, although the shrublands are not reported from Ni`ihau and Kaho`olawe. Elevation ranges from 10 and 1000 m. This group grades into dry strand along the coasts. High-elevation stands transition to montane shrublands near 1000 m elevation. These shrublands occur on open gentle slopes to steep ridges of dissected slopes.

Climate: Climate is tropical with summers hot and dry. Annual precipitation is mostly restricted to the winter months, and ranges from 500 to 1750 mm for shrublands and most grasslands, but grasslands also occur in drier areas (down to 100 mm annual precipitation).

Soil/substrate/hydrology: Substrates are variable. Soils range from silty loams to relatively unweathered pāhoehoe lava. This group also includes coastal dry grasslands that occur outside the coastal effects of salt spray and salinity.

DISTRIBUTION

***Geographic Range:** Leeward side of all the main Hawaiian Islands and some of the smaller dry islands, although the shrublands are not reported from Ni`ihau and Kaho`olawe, and elsewhere in Polynesia.

Nations: MP, US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note
2016-05-26	G441 Hawaiian Ruderal Dry-Site Lava Flow Group	G441 merged into G413

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** W.C. Gagne and L.W. Cuddihy (1990); D. Mueller-Dombois and F.R. Fosberg (1998)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel and K.A. Schulz

Acknowledgments [optional]:

Version Date: 26 May 2016

REFERENCES

***References [Required if used in text]:**

- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
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2.A.2.Oh. Polynesian Montane Shrubland, Grassland & Savanna (D076)**M227. Polynesian Ruderal Montane Shrubland, Grassland & Savanna**

2. Shrub & Herb Vegetation

2.A.2.Oh. Polynesian Montane Shrubland, Grassland & Savanna

G418. Polynesian Ruderal Subalpine-Montane Shrubland & Grassland

Type Concept Sentence: This montane-subalpine ruderal shrubland and grassland group is characterized by a moderate to dense herbaceous layer (<1 m tall) or shrub layer dominated by exotic species. It includes disturbed shrublands dominated by native shrub species with a moderate to dense herbaceous layer strongly dominated by exotic species (>90% relative cover).

OVERVIEW

Hierarchy Level:** GroupPlacement in Hierarchy:** 2.A.2.Oh.90. Polynesian Ruderal Montane Shrubland, Grassland & Savanna (M227)

Elcode: G418

Scientific Name:** *Ulex europaeus* / *Holcus lanatus* - *Pennisetum clandestinum* Ruderal Subalpine-Montane Shrubland & Grassland GroupCommon (Translated Scientific) Name:** Common Gorse / Common Velvetgrass - Kikuyu Grass Ruderal Subalpine-Montane Shrubland & Grassland***Colloquial Name:** Polynesian Ruderal Subalpine-Montane Shrubland & Grassland

***Type Concept:** This montane-subalpine ruderal shrubland and grassland group is characterized by a moderate to dense herbaceous layer (<1 m tall) dominated by exotic species such as *Andropogon virginicus*, *Heterotheca grandiflora*, *Holcus lanatus*, *Melinis minutiflora*, *Melinis repens*, *Nephrolepis multiflora*, *Pennisetum clandestinum*, *Pityrogramma austroamericana*, and many others. Other than *Ulex europaeus* there are relatively few exotic shrubs that dominate montane and subalpine sites. However, this group also includes disturbed shrublands dominated by native shrub species such as *Dodonaea viscosa* and *Styphelia tameiameia* with a moderate to dense herbaceous layer strongly dominated by exotic species (>90% relative cover) that is so altered that the natural plant community cannot be determined. This shrubland and grassland group occurs on slopes of the larger islands in Hawai'i, from near 1000 to 3000 m (3280-9835 feet) elevation. Annual rainfall is generally 400-2500 mm. Soils are generally shallow, over soft, highly weathered `a`a or pahoehoe basaltic lava that retains soil moisture, but includes thin mucky clays, deeper ash deposits and thin, well-drained, cinder-derived soil with many rock outcrops.

Diagnostic Characteristics:**Classification Comments:*****Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: This grassland and shrubland group is characterized by either a grass layer <1 m tall, or an open to closed short (<2-m tall) shrub layer.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This montane-subalpine ruderal shrubland and grassland group is characterized by a moderate to dense herbaceous layer (<1 m tall) dominated by exotic species such as *Andropogon virginicus*, *Heterotheca grandiflora*, *Holcus lanatus*, *Melinis minutiflora*, *Melinis repens*, *Nephrolepis multiflora*, *Pennisetum clandestinum*, *Pityrogramma austroamericana*, and many others. Other than *Ulex europaeus* there are relatively few exotic shrubs that dominate montane and subalpine sites. However, this group also includes disturbed shrublands dominated by native shrub species such as *Dodonaea viscosa* and *Styphelia tameiameia* with a moderate to dense herbaceous layer strongly dominated by exotic species (>90% relative cover) that is so altered that the natural plant community cannot be determined.

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:**ENVIRONMENT**

Environmental Description: This shrubland and grassland group occurs on slopes of the larger islands in Hawai'i, from near 1000 to 3000 m (3280-9835 feet) elevation. Annual rainfall is generally 400-2500 mm. Many sites are wind-exposed. Substrates include cinder, well-drained, sandy loam soils derived from volcanic ash or cinder, and weathered `a`a or pāhoehoe basaltic lava with little soil development.

Climate: Climate is tropical, moderate dry to wet as annual rainfall is ranges from 400-2500 mm with rain distributed fairly evenly throughout the year. Sites range from dry at high elevations to very wet (Zones 2 and 7) of the 7 Moisture Zones developed for the Hawaiian Islands by Price et al. (2007).

Soil/substrate/hydrology: Soils are generally shallow, over soft, highly weathered `a`a or pāhoehoe basaltic lava that retains soil moisture, but includes thin mucky clays, deeper ash deposits and thin, well-drained, cinder-derived soil with many rock outcrops (Gagne and Cuddihy 1990).

DISTRIBUTION

***Geographic Range:** This montane-subalpine ruderal shrubland and grassland group occurs in the larger Hawaiian Islands such as Hawai'i, Moloka'i, Maui, Kaua'i and O`ahu.

Nations: US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note
2016-05-26	G444 Hawaiian Ruderal High Montane Cliff, Scree & Rock Vegetation Group	G444 merged into G418

RELATED CONCEPTS**Supporting Concepts [optional]:**

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP***Primary Concept Source [if applicable]:** K.A. Schulz, in Faber-Langendoen et al. (2016)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** K.A. Schulz

Acknowledgments [optional]:

Version Date: 26 May 2016

REFERENCES***References [Required if used in text]:**

- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Gagne, W. C., and L. W. Cuddihy. 1990. Vegetation. Pages 45-114 in: W. L. Wagner, D. R. Herbst, and S. H. Sohmer, editors. Manual of the Flowering Plants of Hawaii. 2 volumes. University of Hawaii Press, Honolulu.
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2.A.3.Ob. Polynesian Scrub & Herb Coastal Vegetation (D078)**M234. Polynesian Ruderal Scrub & Herb Coastal Strand**

2. Shrub & Herb Vegetation

2.A.3.Ob. Polynesian Scrub & Herb Coastal Vegetation

G423. Polynesian Ruderal Scrub & Herb Coastal Strand

Type Concept Sentence: This ruderal strand group is restricted to the shoreline and the zone immediately back of it where sites are strongly influenced by surf, wind and salt spray and where the vegetation tends to be sparse and patchy. Vegetation includes succulent herbs, low wind-sheared shrubs, grasslands, mixtures of drier shrub and grasses or taller shrublands. The vegetation is strongly dominated by non-native species such as *Atriplex semibaccata*, *Atriplex suberecta*, *Vachellia farnesiana*, *Batis maritima*, *Cocos nucifera*, *Coccinia grandis*, *Cynodon dactylon*, *Kalanchoe pinnata*, *Lantana camara*, *Leucaena leucocephala*, *Melinis repens*, *Pennisetum ciliare*, *Pluchea indica*, *Prosopis pallida*, *Sphagneticola trilobata*, *Tetragonia tetragonioides*, and *Verbesina encelioides*.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.A.3.Ob.90. Polynesian Ruderal Scrub & Herb Coastal Strand (M234)

Elcode: G423

- *Scientific Name:** *Cocos nucifera* / *Pennisetum polystachion* - *Pennisetum purpureum* Ruderal Scrub & Herb Coastal Strand Group
***Common (Translated Scientific) Name:** Coconut Palm / Mission Grass - Elephant Grass Ruderal Scrub & Herb Coastal Strand Group
***Colloquial Name:** Polynesian Ruderal Scrub & Herb Coastal Strand

***Type Concept:** This ruderal strand group is restricted to the shoreline and the zone immediately back of it where sites are strongly influenced by surf, wind and salt spray and where the vegetation tends to be sparse and patchy. Vegetation includes succulent herbs, low wind-sheared shrubs, grasslands, dry shrubs and grasses or taller shrublands, often with scattered trees, especially *Cocos nucifera*. The vegetation is strongly dominated by non-native species. Characteristic species include *Atriplex semibaccata*, *Vachellia farnesiana* (= *Acacia farnesiana*), *Batis maritima*, *Cocos nucifera*, *Coccinia grandis*, *Cynodon dactylon*, *Kalanchoe pinnata*, *Lantana camara*, *Leucaena leucocephala*, *Melinis repens*, *Morinda citrifolia*, *Pennisetum ciliare*, *Pluchea indica*, *Prosopis pallida*, *Sphagneticola trilobata*, *Tetragonia tetragonioides*, *Thespesia populnea*, *Tournefortia argentea*, and *Verbesina encelioides*. Stands occur along disturbed coasts of the Hawaiian Islands and are restricted to the shoreline and the zone immediately back of it. Elevation is generally below 30 m. Sites may be rocky shorelines or sandy beaches, some with adjacent dunes or low alkaline flats above the saturated zone and behind the high-tide mark. Climate is warm, tropical. Annual precipitation ranges from over 3500 mm for wet strand, down to 1200 mm on seasonally mesic sites, and less than 1200 mm for dry strand. Substrates are variable, ranging from sandy beaches to cobbly shores, derived from volcanic tuff, recent lava flows or old disintegrating lava (basalt), or raised coral beds (limestone).

***Diagnostic Characteristics:**

***Classification Comments:** This group is similar to ~Hawaiian Ruderal Coastal Salt Marsh Group (G433)\$\$; however, stands in this group are restricted to strand sites that are strongly influenced by surf, wind and salt spray. Strand stands with distinct tree canopies should likely be classified in similar lowland forest groups ~Polynesian Ruderal Lowland Rainforest Group (G390)\$\$ or ~Polynesian Ruderal Dry Woodland & Scrub Group (G407)\$\$.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G433	Hawaiian Ruderal Coastal Salt Marsh	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: This ruderal group tends to be sparse and patchy and include succulent herbs, low wind-sheared shrubs, grasslands, mixtures of drier shrub and grasses or taller shrublands.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Vegetation is disturbed in this ruderal group and tends to be a sparse and patchy mixture of non-native shrubs, grasses, herbs and scattered trees. Characteristic species include *Atriplex semibaccata*, *Vachellia farnesiana* (= *Acacia farnesiana*), *Batis maritima*, *Chloris barbata*, *Cocos nucifera*, *Coccinia grandis*, *Cynodon dactylon*, *Kalanchoe pinnata*, *Lantana camara*, *Leucaena leucocephala*, *Melinis repens*, *Morinda citrifolia*, *Pennisetum ciliare*, *Pluchea indica*, *Prosopis pallida*, *Sphagneticola trilobata*, *Tetragonia tetragonioides*, *Thespesia populnea*, *Tournefortia argentea*, and *Verbesina encelioides*. If the stand forms a distinct tree canopy then it should be classified in the ruderal coastal or lowland forest groups ~Polynesian Ruderal Lowland Rainforest Group (G390)\$\$ or ~Polynesian Ruderal Dry Woodland & Scrub Forest Group (G407)\$\$.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Const-ancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description: This ruderal group occurs along disturbed coasts of the Hawaiian Islands. Stands are restricted to the shoreline and the zone immediately back of it where sites are strongly influenced by surf, wind and salt spray. Elevation is generally

below 30 m. Sites may be rocky shorelines or sandy beaches, some with adjacent dunes or low alkaline flats above the saturated zone and behind the high-tide mark.

Climate: Climate is warm, tropical. Annual precipitation ranges from over 3500 mm for wet strand, down to 1200 mm on seasonally mesic sites, and less than 1200 mm for dry strand. The wet to mesic strand occurs within the seasonally mesic, moist mesic, and moderately wet zones (Zones 4, 5 and 6) and the arid to moderately dry coastal strand occurs within the arid, very dry, and moderately dry zones (Zones 1, 2 and 3) of the 7 Moisture Zones developed for the Hawaiian Islands by Price et al. (2007).

Soil/substrate/hydrology: Substrates are variable, ranging from sandy beaches to cobbly shores, derived from volcanic tuff, recent lava flows or old disintegrating lava (basalt), or raised coral beds (limestone).

DISTRIBUTION

***Geographic Range:** This ruderal strand group occurs along disturbed coasts of the Hawaiian Islands and may include the smaller, arid islands and atolls that are widespread in the northwestern Hawaiian Islands.

Nations: MP, US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	Coastal Wet Shrubland	Gagne and Cuddihy 1990	

AUTHORSHIP

***Primary Concept Source [if applicable]:** K.A. Schulz, in Faber-Langendoen et al. (2016)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** K.A. Schulz

Acknowledgments [optional]:

Version Date: 26 May 2016

REFERENCES

***References [Required if used in text]:**

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- Gagne, W. C., and L. W. Cuddihy. 1990. Vegetation. Pages 45-114 in: W. L. Wagner, D. R. Herbst, and S. H. Sohmer, editors. Manual of the Flowering Plants of Hawaii. 2 volumes. University of Hawaii Press, Honolulu.
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- Warshauer, F. R., J. D. Jacobi, and J. P. Price. 2008. Native coastal flora and plant communities in Hawai'i: Their composition, distribution and status. Technical Report HCSU-014, USGS Hawai'i Cooperative Studies Unit, University of Hawai'i at Hilo.

2.B.1.Na. Californian Scrub & Grassland (D327)**M046. Californian Ruderal Grassland, Meadow & Scrub**

2. Shrub & Herb Vegetation

2.B.1.Na. Californian Scrub & Grassland

G497. Californian Ruderal Grassland, Meadow & Scrub

Type Concept Sentence: This warm-temperate Californian ruderal grassland, forbland and scrub group is most commonly dominated by non-native annual or perennial herbaceous species which compose >75% of the foliar cover and include many graminoids such as *Avena barbata*, *Avena fatua*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus madritensis*, *Cortaderia jubata*, *Cortaderia selloana*, *Lolium perenne ssp. multiflorum*, *Hordeum murinum*, *Taeniatherum caput-medusae*, *Vulpia bromoides*, *Vulpia myuros*, and forbs, including *Carduus pycnocephalus*, *Centaurea spp.*, *Erodium botrys*, *Erodium cicutarium*, *Medicago polymorpha*, *Geranium dissectum*, *Hypochaeris glabra*, and *Raphanus sativus*. [Now includes EVT 9337 Californian Ruderal Scrub \(G802\).](#)

OVERVIEW

Hierarchy Level:** GroupPlacement in Hierarchy:** 2.B.1.Na.90. Californian Ruderal Grassland, Meadow & Scrub (M046)

Elcode: G497

Scientific Name:** *Avena fatua* - *Bromus diandrus* Ruderal Grassland, Meadow & Scrub GroupCommon (Translated Scientific) Name:** Wild Oat - Ripgut Brome Ruderal Grassland, Meadow & Scrub Group***Colloquial Name:** Californian Ruderal Grassland, Meadow & Scrub

***Type Concept:** This group encompasses the non-native-dominated annual or perennial grasslands and forblands found in warm-temperate or Mediterranean California. They occur on the coastal plains, in the Central Valley, in the foothills and in disturbed rural and urban areas. Native graminoid and forb species can be present with low or insignificant cover. The overwhelming dominance of the introduced species is undeniable. Non-native species make up 50-96% of the foliar cover. Dominant introduced graminoid species include *Aegilops triuncialis*, *Avena fatua*, *Avena barbata*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus madritensis*, *Cortaderia jubata*, *Cortaderia selloana*, *Lolium perenne ssp. multiflorum* (= *Lolium multiflorum*), *Hordeum murinum*, *Pennisetum ciliare*, *Pennisetum setaceum*, *Taeniatherum caput-medusae*, *Vulpia bromoides*, and *Vulpia myuros*. Introduced forb species include *Brassica nigra*, *Carduus pycnocephalus*, *Centaurea spp.*, *Erodium botrys*, *Erodium cicutarium*, *Medicago polymorpha*, *Geranium dissectum*, *Hypochaeris glabra*, *Medicago polymorpha*, and *Raphanus sativus*. Species in non-native shrublands include *Ulex europaeus*, *Cytisus scoparius*, and species of *Genista* and *Spartium*, among others. There are many more species that can be dominant. California annual grassland is found on a wide variety of soils, sometimes in complex mosaics. Most are noncalicic Mollisols, medium to heavy texture, about 0.5 m deep.

***Diagnostic Characteristics:** Dominance by exotic, introduced and/or non-native annual or perennial grass and forb species, such as *Aegilops triuncialis*, *Avena barbata*, *Avena fatua*, *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus madritensis*, *Bromus rubens*, *Cortaderia jubata*, *Cortaderia selloana*, *Cynosurus echinatus*, *Hordeum murinum*, *Lolium perenne ssp. multiflorum*, *Hordeum murinum*, *Pennisetum ciliare*, *Pennisetum setaceum*, *Taeniatherum caput-medusae*, *Vulpia*

bromoides, and *Vulpia myuros*. Introduced forb species include *Brassica nigra*, *Carduus pycnocephalus*, *Centaurea solstitialis*, *Centaurea melitensis*, *Centaurea virgata*, *Conium maculatum*, *Foeniculum vulgare*, *Erodium botrys*, *Erodium cicutarium*, *Medicago polymorpha*, *Geranium dissectum*, *Hypochaeris glabra*, *Medicago polymorpha*, and *Raphanus sativus*. Species in non-native shrublands include *Ulex europaeus*, *Cytisus scoparius*, and species of *Genista* and *Spartium*, among others. Native herbaceous species may be present, but these with less than 10% relative cover in the herbaceous layer.

***Classification Comments:** Non-native scrub types were added to this group. They need better characterization. Preliminary notes include the following observations: Some exotic grasses, forbs and shrubs of this macrogroup are shared with ~Southern Vancouverian Lowland Ruderal Grassland & Shrubland Group (G648)\$\$, including *Cytisus scoparius* and *Ulex europaeus*. It is not clear whether sufficient diagnostics provide an effective way to discriminate stands dominated by these exotics across divisions (cool-temperate Pacific coastal versus warm-temperate/Mediterranean California).

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G496	Californian Perennial Grassland	differs in that native species have 10% or greater relative cover in the herbaceous layer and 5% or greater absolute cover.
G648	Southern Vancouverian Lowland Ruderal Grassland & Shrubland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Herbaceous vegetation composed of perennial or annual grasses and forbs. Height variable, but generally <0.5 m, although some can be much taller (e.g., *Cortaderia* spp. stands).

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Graminoids include *Aegilops triuncialis*, *Avena barbata*, *Avena fatua*, *Brachypodium distachyon*, *Briza maxima*, *Bromus diandrus*, *Bromus hordeaceus*, *Bromus madritensis*, *Bromus rubens*, *Cortaderia jubata*, *Cortaderia selloana*, *Cynosurus echinatus*, *Hordeum murinum*, *Lolium perenne* ssp. *multiflorum* (= *Lolium multiflorum*), *Pennisetum ciliare*, *Pennisetum setaceum*, *Schismus arabicus*, *Schismus barbatus*, *Taeniatherum caput-medusae*, *Vulpia bromoides*, and *Vulpia myuros*. Forb species include *Brassica nigra*, *Carduus pycnocephalus*, *Centaurea melitensis*, *Centaurea solstitialis*, *Centaurea virgata*, *Conium maculatum*, *Erodium botrys*, *Erodium cicutarium*, *Foeniculum vulgare*, *Geranium dissectum*, *Hypochaeris glabra*, *Medicago polymorpha*, and *Raphanus sativus*.

Species in non-native shrublands include *Ulex europaeus*, *Cytisus scoparius*, and species of *Genista* and *Spartium*, among others. Native herbaceous species may be present, but these with less than 10% relative cover in the herbaceous layer. The most ubiquitous ruderal shrub species in central California is *Genista monspessulana*. It tends to colonize bare soils exposed on construction sites in the California Coast Ranges and northern Sierra Nevada foothills. It quickly builds up a seed bank and, for invasives control, removal of shrubs must be followed up with repeated removal of seedlings for years. Hybrids of several species of introduced *Genista* and *Cytisus* have colonized slopes in central and southern coastal California.

Floristic information is summarized from the following sources: Evens and San (2004, 2006), Klein and Evens (2005), Keeler-Wolf and Evens (2006), and Sawyer et al. (2009).

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Stands are a result of historic or recent heavy continuous grazing or other disturbance. Classification to this ruderal group does not preclude the possibility of successful restoration back to the native California grassland group. Stands dominated by these annual and perennial species are adapted to frequent fires and summer droughts. Stands dominated by introduced cool-season, annual grasses have germinating seeds that survive the sporadic wetting and drying cycles that occur though the growing season.

Most seeds germinate after the first significant rain in the fall. Plants set seed and die by the end of the growing season in the spring (Sawyer et al. 2009).

ENVIRONMENT

Environmental Description:

DISTRIBUTION

***Geographic Range:** This group occurs in the warm-temperate ("Mediterranean") California coastal plain and Central Valley, also in the southeastern portions of the state in transitions to California desert regions.

Nations: MX, US

States/Provinces: CA, OR?

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4214	<i>Brassica nigra</i> - <i>Raphanus</i> spp. Ruderal Annual Forb Meadow Alliance
A3870	<i>Avena fatua</i> - <i>Bromus</i> spp. Ruderal Annual Grassland Alliance
A3872	<i>Centaurea virgata</i> ssp. <i>squarrosa</i> - <i>Conium maculatum</i> - <i>Foeniculum vulgare</i> Ruderal Meadow Alliance
A1203	<i>Cortaderia jubata</i> - <i>Cortaderia selloana</i> Ruderal Grassland Alliance
A3871	<i>Lolium perenne</i> Ruderal Grassland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note
2015-12-10	G802 Californian Ruderal Scrub Group	G802 merged into G497

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** G. Kittel, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel, M. Reid and D. Faber-Langendoen

Acknowledgments [optional]:

Version Date: 13 Jan 2016

REFERENCES

***References [Required if used in text]:**

- Bartolome, J. W. W. J. Barry, T. Griggs, and P. Hopkinson. 2007. Valley grassland. Pages 367-393 in: M. G. Barbour, T. Keeler-Wolf and A. A. Schoenherr. Terrestrial vegetation of California, 3rd ed. University of California Press, Berkeley.
- Buck-Diaz, J., J. Ratchford, and J. M. Evens. 2013. California rangeland monitoring and mapping: Focusing upon Great Valley and Carrizo Plain grassland habitats, California. Unpublished report submitted to the Natural Resources Conservation Service. California Native Society, Sacramento, CA. [http://cnps.org/cnps/vegetation/pdf/grassland_nrnc_report-2013c.pdf]
- Buck-Diaz, J., S. Batiuk, and J. M. Evens. 2012. Vegetation alliances and associations of the Great Valley ecoregion, California. California Native Society, Sacramento, CA. [http://cnps.org/cnps/vegetation/pdf/great_valley_eco-vegclass2012.pdf]
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- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Keeler-Wolf, T., and J. Evens. 2006. Vegetation classification of the Santa Monica Mountains National Recreation Area and environs in Ventura and Los Angeles counties, California. A report submitted to National Park Service, Santa Monica Mountains National Recreation Area by California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch and The California Native Plant Society, Vegetation Program, Sacramento, CA.
- Klein, A., and J. Evens. 2006. Vegetation alliances of western Riverside County, California. Contract Number: P0185404. Final report prepared for The California Department of Fish and Game, Habitat Conservation Division. California Native Plant Society, Sacramento, CA. 332 pp. [http://www.dfg.ca.gov/biogeodata/vegcamp/pdfs/VegMappingRpt_Western_Riverside.pdf]
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- Shiflet, T. N., editor. 1994. Rangeland cover types of the United States. Society for Range Management. Denver, CO. 152 pp.

2.B.2.Na. Western North American Grassland & Shrubland (D022)**M493. Western North American Ruderal Grassland & Shrubland**

2. Shrub & Herb Vegetation

2.B.2.Na. Western North American Grassland & Shrubland

G624. Western North American Interior Ruderal Grassland & Shrubland

Type Concept Sentence: This group includes grasslands dominated by the non-native grass *Elymus repens* and is known from disturbed valley bottoms, alluvial flats, fans and lower valley wall sites in western Colorado and northwestern Montana.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.B.2.Na.90. Western North American Ruderal Grassland & Shrubland (M493)

Elcode: G624

***Scientific Name:** Western North American Interior Ruderal Grassland & Shrubland Group

***Common (Translated Scientific) Name:** Western North American Interior Ruderal Grassland & Shrubland Group

***Colloquial Name:** Western North American Interior Ruderal Grassland & Shrubland

***Type Concept:** This montane, mesic to subhygric herbaceous group has low overall species diversity due to the dominance of *Elymus repens*, an exotic rhizomatous grass. *Elymus repens* is a highly invasive species in mesic areas and tends to exclude other species once established. Overall herbaceous cover ranges from 25-85% with *Elymus repens* clearly dominating with 5-80% cover.

This group occurs in western Colorado, northwestern Montana, and southern Idaho. Sites include disturbed valley bottoms, alluvial flats, fans and lower valley wall sites between 1450 and 2300 m in elevation.

***Diagnostic Characteristics:**

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G678	Californian Ruderal Forest	
G819	North American Warm Desert Ruderal Scrub	
G677	North American Warm Desert Ruderal Grassland	
G600	Great Basin-Intermountain Ruderal Dry Shrubland & Grassland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION

***Geographic Range:**

Nations: CA, US

States/Provinces: CA, CO, KS, MT, ND, NE, NV, SD, UT, WY

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4191	<i>Rumex crispus</i> - (other FAC & Dryland Forb Species) Ruderal Meadow Alliance
A2658	<i>Elymus repens</i> Ruderal Grassland Alliance
A3254	<i>Agropyron cristatum</i> - <i>Bromus inermis</i> - <i>Poa pratensis</i> Ruderal Grassland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: K.A. Schulz, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: G. Kittel

Acknowledgments [optional]:

Version Date: 23 Nov 2016

REFERENCES

*References [Required if used in text]:

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

2. Shrub & Herb Vegetation

2.B.2.Na. Western North American Grassland & Shrubland

G648. Southern Vancouverian Lowland Ruderal Grassland & Shrubland

Type Concept Sentence: This group is dominated by non-native invasive shrub or herbaceous species, such as *Agrostis capillaris*, *Anthoxanthum odoratum*, *Cytisus scoparius*, *Rubus armeniacus*, or many other introduced species, generally occurring on disturbed land throughout Pacific coastal areas below approximately 1500 m (5000 feet) in elevation.

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 2.B.2.Na.90. Western North American Ruderal Grassland & Shrubland (M493)

Elcode: G648

*Scientific Name: Southern Vancouverian Lowland Ruderal Grassland & Shrubland Group

*Common (Translated Scientific) Name: Southern Vancouverian Lowland Ruderal Grassland & Shrubland Group

*Colloquial Name: Southern Vancouverian Lowland Ruderal Grassland & Shrubland

***Type Concept:** This group is dominated by non-native species, such as introduced and invasive shrubs *Cytisus scoparius*, *Rubus armeniacus*, *Ulex europaeus*, and the introduced grasses *Agrostis capillaris*, *Anthoxanthum odoratum*, *Bromus hordeaceus*, *Holcus lanatus*, and/or *Poa pratensis*. It is abundant in waste areas and disturbed land throughout Pacific coastal areas either as abandoned pastures, roadside margins or other weedy places, below approximately 1500 m (5000 feet) in elevation. Sites are not mowed or otherwise maintained. Generally, these are areas that have been heavily disturbed by heavy equipment, such as old plowed fields, townsites, and abandoned millsites, livestock holding areas, and other once heavily used places that have been left as "waste" places.

*Diagnostic Characteristics:

***Classification Comments:** Restoration stands of planted or seeded native grasses such as *Festuca idahoensis ssp. roemerii*, *Festuca rubra*, or *Leymus mollis* are considered ruderal due to the fact that the planted species are the only native species present. If long-term restoration efforts succeed in reestablishing composition typical of a native plant associations, then stands could be reclassified into that type.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G497	Californian Ruderal Grassland, Meadow & Scrub	
G647	North Pacific Maritime Coastal Ruderal Dune	
G677	North American Warm Desert Ruderal Grassland	
G819	North American Warm Desert Ruderal Scrub	
G600	Great Basin-Intermountain Ruderal Dry Shrubland & Grassland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Sites are dominated by non-native herbaceous species, or introduced shrubs such as *Cytisus scoparius*, *Rubus armeniacus*, *Ulex europaeus*, and *Lupinus arboreus*, or areas planted/seeded with native grasses undergoing restoration. In some areas, stands may be dominated by native herbaceous species; however, these cases occur on clearly disturbed ground. Non-native graminoids that can be abundant include *Agrostis avenacea*, *Agrostis capillaris*, *Agrostis stolonifera*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Bromus diandrus ssp. rigidus* (= *Bromus rigidus*), *Bromus hordeaceus*, *Bromus madritensis*, *Bromus sterilis*, *Cynosurus echinatus*, *Schedonorus arundinaceus* (= *Schedonorus phoenix*), *Lolium perenne*, and *Vulpia bromoides* (= *Festuca bromoides*). Other graminoids that are present to abundant include *Aira caryophyllea*, *Aira praecox*, *Dactylis glomerata*, *Elymus repens*, *Holcus lanatus*, and *Poa pratensis*. Some areas are dominated by non-native forbs such as *Cirsium arvense*, *Hypochaeris radicata*, *Leucanthemum vulgare*, *Medicago lupulina*, *Rumex acetosella*, *Sisymbrium altissimum*, *Taraxacum officinale*, *Teesdalia nudicaulis*, and *Trifolium dubium*.

Of course, some waste areas are a mix of non-native grasses and forbs, or a mix of native and non-native species. Other non-native forbs that may be present include *Centaureum erythraea*, *Cirsium vulgare*, *Trifolium pratense*, *Vicia hirsuta*, and *Vicia sativa*. Native graminoids that may be present include *Carex inops*, *Bromus sitchensis*, *Elymus glaucus*, *Festuca rubra ssp. rubra*, and *Leymus mollis*. Stands of planted or seeded areas of native grasses (areas undergoing restoration) are included in this group until they mature into recognizable native plant associations. Native forbs and ferns that can be increasers with disturbance may be present and include *Cerastium arvense*, *Galium aparine*, *Heracleum maximum*, *Marah oreganus*, and *Pteridium aquilinum*. Some native shrubs may be scattered about with low abundance and include *Rubus ursinus*, *Symphoricarpos albus* and *Rosa nutkana*. Some areas have small to extensive patches of the introduced shrub *Rubus armeniacus* that is usually interspersed with the non-native grasses mentioned above.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Const-ancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: This group is generally a product of disturbance or abandonment of human or livestock activity, and once established is a quite permanent part of the landscape.

ENVIRONMENT

Environmental Description: This group is widespread throughout the coastal areas of the Pacific Northwest, but has been intensively studied in the Puget Sound specifically. Stands occur on soils that have been disturbed in the past from plowing, grazing or animal holding areas such as old corrals or rabbit warrens. Soils are mostly shallow and textures range from gravel, sand, sandy loam to loam. These areas are mostly flat or on low slopes and are usually well-drained. Hydrology ranges from very dry south-facing slopes to somewhat mesic north-facing protected sites. This group does not include sand dunes.

DISTRIBUTION

***Geographic Range:** This group occurs in the Pacific Northwest in disturbed sites and waste areas along the coast from California to Washington and possibly elsewhere.

Nations: CA?, US

States/Provinces: BC?, CA, OR, WA

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A2063	<i>Anthoxanthum odoratum</i> - <i>Holcus lanatus</i> Ruderal Coastal Grassland Alliance
A2062	<i>Cytisus scoparius</i> - <i>Ulex europaeus</i> Coastal Ruderal Scrub Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** G. Kittel, in Faber-Langendoen et al. (2012)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel

Acknowledgments [optional]:

Version Date: 20 May 2015

REFERENCES

***References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

2.B.2.Nb. Central North American Grassland & Shrubland (D023)

M498. Great Plains Ruderal Grassland & Shrubland

2. Shrub & Herb Vegetation

2.B.2.Nb. Central North American Grassland & Shrubland

G680. Great Plains Comanchian Ruderal Grassland & Shrubland

Type Concept Sentence: This group is dominated by a variety of non-native invasive or native adventive grasses, forbs, or shrubs and is found from Oklahoma through central Texas to western and southern Texas and into Mexico. [Name in LANDFIRE EVT_LUT = Southern Plains & Texas Ruderal & Planted Grassland & Shrubland \(EVT code 9325\).](#)

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.B.2.Nb.90. Great Plains Ruderal Grassland & Shrubland (M498)

Elcode: G680

***Scientific Name:** Great Plains Comanchian Ruderal Grassland & Shrubland Group

***Common (Translated Scientific) Name:** Great Plains Comanchian Ruderal Grassland & Shrubland Group

***Colloquial Name:** Great Plains Comanchian Ruderal Grassland & Shrubland

***Type Concept:** This group is found from Oklahoma through central Texas to western and southern Texas, and eastern New Mexico, south into Mexico. It is dominated by non-native invasive or native adventive grasses, forbs, or shrubs that become abundant after significant disturbance, often associated with agricultural activities, or a disruption of natural disturbance regimes. Common disturbances which favor establishment of this group include long-term, heavy grazing, planting exotic species for livestock forage, plowing land and then abandoning it, and a disruption of the natural fire regime. Vegetation cover varies from low to very high. Abundant species vary greatly in this group, depending on the geographic location, seed sources, and nature of land use. This group includes pastures characterized by non-native invasive grasses such as *Bothriochloa ischaemum*, *Dichanthium annulatum*, *Dichanthium sericeum*, *Pennisetum ciliare* (= *Cenchrus ciliaris*), and *Setaria* spp. It includes pastures and other disturbed areas dominated by native increasers such as *Bouteloua dactyloides* (= *Buchloe dactyloides*), and successional shrublands of old fields, pastures and other cleared areas that were previously forested and dominated by native species of *Crataegus*, *Rhus lanceolata*, or *Baccharis neglecta*. In some cases, areas dominated by these species were originally planted, but now the species have become completely naturalized, and may dominate large areas. This group also includes native upland shortgrass prairie areas dominated by invasive *Prosopis glandulosa*.

***Diagnostic Characteristics:** This group is dominated by non-native invasive or native adventive grasses, forbs, or shrubs that become abundant after significant disturbance, often associated with agricultural activities, or a disruption of natural disturbance regimes. Common disturbances which favor establishment of this group include long-term, heavy grazing, planting exotic species for livestock forage, plowing land and then abandoning it, and a disruption of the natural fire regime.

***Classification Comments:** Although *Prosopis glandulosa* was reported in the Texas Panhandle in 1849 and along the Canadian River in New Mexico in 1715 prior to extensive cattle grazing (Hart 2008), in the last hundred years it has expanded into upland areas in the shortgrass prairie where it did not occur historically and is considered to be ruderal or novel vegetation.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G679	Northern & Central Great Plains Ruderal Grassland & Shrubland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Examples of this group range from herbaceous-dominated to shrub-dominated.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This group includes pastures characterized by non-native invasive grasses such as *Bothriochloa ischaemum*, *Dichanthium annulatum*, *Dichanthium sericeum*, *Pennisetum ciliare* (= *Cenchrus ciliaris*), and *Setaria* spp. It includes pastures and other disturbed areas dominated by native increasers such as *Bouteloua dactyloides* (= *Buchloe dactyloides*), and successional shrublands of old fields, pastures and other cleared areas that were previously forested and dominated by native species of *Crataegus*, *Rhus lanceolata*, or *Baccharis neglecta*. This group also includes native upland shortgrass prairie areas dominated by invasive *Prosopis glandulosa*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Const-ancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: It is dominated by non-native invasive or native adventive grasses, forbs, or shrubs that become abundant after significant disturbance, often associated with agricultural activities, or a disruption of natural disturbance regimes. Common disturbances which favor establishment of this group include long-term, heavy grazing, planting exotic species for livestock forage, plowing land and then abandoning it, and a disruption of the natural fire regime.

Historically, mesquite-dominated shrublands and tree savannas probably occurred as a natural component on more fertile soils and along drainages where soils are deep in the short- and midgrass prairie, but mesquite has expanded its range into prairie uplands in recent decades (Sims and Risser 2000). Previously, periodic fire limited the development of woody cover to widely scattered large mesquite trees or possibly denser trees resembling a tree savanna (Archer 1989). Livestock grazing reduces fine fuels that carry fire and disperse seeds away from seed predators in animal dung which provides favorable conditions for germination and establishment (Archer 1989, Brown and Archer 1989). These recent invasive upland mesquite shrublands are considered ruderal or novel in the shortgrass prairie where it did not occur historically.

ENVIRONMENT

Environmental Description: This vegetation occupies a variety of landscape positions and soil types.

DISTRIBUTION

***Geographic Range:** This group is found from Oklahoma through central Texas to western and southern Texas, and eastern New Mexico, south into Mexico.

Nations: MX, US

States/Provinces: MXCO, MXNU, MXTM, NM, OK, TX

USFS Ecoregions (2007) [optional]: 255A:CC, 255B:CC, 255C:CC, 255D:CC, 315E:CC

Omernik Ecoregions L3, L4 [optional]: 8.3.8.33:C, 9.4.2.27:C, 9.4.5.29:C, 9.4.7.32:C, 9.5.1.34:C, 9.6.1.31:C

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4233	Great Plains Comanchian Ruderal Grassland Alliance
A4232	Great Plains Comanchian Ruderal Shrubland Alliance
A3952	<i>Prosopis glandulosa</i> Shortgrass Prairie Ruderal Scrub Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]:

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: J. Teague, K.A. Schulz

Acknowledgments [optional]:

Version Date: 10 Nov 2015

REFERENCES

*References [Required if used in text]:

- Archer, S. 1989. Have southern Texas savannas been converted to woodlands in recent history? *The American Naturalist* 134:545-561.
- Brown, J. R., and S. Archer. 1989. Woody plant invasion of grasslands: Establishment of honey mesquite (*Prosopis glandulosa* var. *glandulosa*) on sites differing in herbaceous biomass and grazing history. *Oecologia* 80:19-26.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Hart, R. H. 2008. Land-use history on the Shortgrass Steppe. Pages 55-69 in: W. K. Lauenroth and I. C. Burke, editors. *Ecology of the shortgrass steppe: A long-term perspective*. Oxford University Press, New York.
- Sims, P. L., and P. G. Risser. 2000. Grasslands. Pages 325-356 in: M. G. Barbour and W. D. Billings, editors. *North American terrestrial vegetation*. Second edition. Cambridge University Press, New York. 434 pp.

2. Shrub & Herb Vegetation

2.B.2.Nb. Central North American Grassland & Shrubland

G679. Northern & Central Great Plains Ruderal Grassland & Shrubland

Type Concept Sentence: This group is found in the Great Plains from Nebraska and Colorado north where exotic grasses and forbs constitute >75% of the herbaceous cover and trees and shrubs each have less than 25% cover.

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 2.B.2.Nb.90. Great Plains Ruderal Grassland & Shrubland (M498)

Elcode: G679

*Scientific Name: *Poa pratensis* - *Phleum pratense* - *Cirsium arvense* Northern & Central Plains Ruderal Grassland & Shrubland Group

*Common (Translated Scientific) Name: Kentucky Bluegrass - Timothy - Canada Thistle Northern & Central Plains Ruderal Grassland & Shrubland Group

*Colloquial Name: Northern & Central Great Plains Ruderal Grassland & Shrubland

*Type Concept: This group occurs in the northern two-thirds of the Great Plains. Sites are strongly dominated by exotic grasses and forbs, mostly perennial species but sometimes annuals. Examples range from having a mix of species to sites strongly dominated by one or two species. Abundant species vary across the group, depending on land-use history, including what may have been planted on the site, nearby seed sources, whether a site is mesic or dry, and other factors. Common abundant or dominant species include the grasses *Agropyron cristatum*, *Agrostis gigantea*, *Agrostis stolonifera*, *Bromus inermis*, *Lolium perenne*, *Phleum pratense*, *Poa annua*, *Poa pratensis*, and *Thinopyrum intermedium* and the forbs *Ambrosia* spp., *Cirsium arvense*, *Cirsium vulgare*, *Euphorbia esula*, and *Melilotus officinalis*.

*Diagnostic Characteristics: This group is found in the northern half of the Great Plains and is strongly dominated (>75%) by exotic and weedy native herbaceous species.

***Classification Comments:** This group occurs when the floristics of a site are so changed that the natural vegetation type is no longer recognizable. This requires a very high cover by exotic and native weedy species. The cut-off is currently in the range of 75-90% cover.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G680	Great Plains Comanchian Ruderal Grassland & Shrubland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Grasses and forbs dominate this group with shrubs and trees sometimes present but with less than 25% cover. The herbaceous stratum is generally 0.5-1 m tall with some stands dominated by species approximately 2 m tall. Perennial species are typically most abundant but sites in the western part of the group's range or those that were recently disturbed may have significant amounts of annuals.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Examples range from having a mix of species to sites strongly dominated by one or two species. Abundant species vary across the group, depending on land-use history, including what may have been planted on the site, nearby seed sources, whether a site is mesic or dry, and other factors. Common abundant or dominant species include the grasses *Agropyron cristatum*, *Agrostis gigantea*, *Agrostis stolonifera*, *Bromus inermis*, *Lolium perenne*, *Phleum pratense*, *Poa annua*, *Poa pratensis*, and *Thinopyrum intermedium* and the forbs *Ambrosia* spp., *Cirsium arvense*, *Cirsium vulgare*, *Euphorbia esula*, and *Melilotus officinalis*. Other common species include the annual grasses *Bromus arvensis*, *Bromus catharticus*, *Bromus hordeaceus*, *Bromus racemosus*, *Bromus secalinus*, *Bromus tectorum*, *Digitaria* spp., *Setaria faberi*, *Setaria italica*, *Setaria pumila*, *Setaria verticillata*, and *Setaria viridis* and the forbs *Bassia scoparia*, *Carduus* spp., *Centaurea* spp., *Chenopodium album*, *Datura stramonium*, *Lotus corniculatus*, *Rumex acetosella*, *Rumex crispus*, *Salsola* spp., *Sonchus* spp., *Trifolium arvense*, *Trifolium aureum*, *Trifolium campestre*, *Trifolium dubium*, *Trifolium hybridum*, *Trifolium repens*, and *Trifolium pratense*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Examples of this group are, by definition, a result of a change in ecological processes or a direct introduction of exotic species. This is usually the result of some combination of a reduction in fire frequency, increased grazing pressure, intentional planting of exotic species or the unintentional spread of exotic species from nearby sources. Many of the exotic species are persistent once they are established on a site so reversion to a native vegetation type is not certain even if the disturbance that allowed the formation of this group is removed.

ENVIRONMENT

Environmental Description: This group can be found on a variety of environmental settings. It can occur on wet-mesic to dry-mesic sites ranging from swales and floodplains to drier ridges and slopes.

DISTRIBUTION

***Geographic Range:** This group is found across the northern two-thirds of the Great Plains from Colorado and Nebraska north with possible outlier occurrences in Utah. It is likely in Kansas, as well.

Nations: CA, US

States/Provinces: AB, CO, KS?, MB, MT, ND, NE, SD, SK, UT, WY

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]:

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: J. Drake

Acknowledgments [optional]:

Version Date: 07 May 2015

REFERENCES

*References [Required if used in text]:

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

2.B.2.Nc. Eastern North American Grassland & Shrubland (D024)

M123. Eastern North American Ruderal Grassland & Shrubland

2. Shrub & Herb Vegetation

2.B.2.Nc. Eastern North American Grassland & Shrubland

G059. Eastern North American Ruderal Meadow & Shrubland

Type Concept Sentence: This group encompasses old fields in the northern and central regions of the eastern United States dominated by native and exotic forbs, grasses, ferns and shrubs that occur on sites that have been cleared and plowed (for farming or development), and then abandoned.

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 2.B.2.Nc.90. Eastern North American Ruderal Grassland & Shrubland (M123)

Elcode: G059

*Scientific Name: *Solidago altissima* - *Poa pratensis* - *Cornus foemina* Ruderal Meadow & Shrubland Group

***Common (Translated Scientific) Name:** Tall goldenrod - Kentucky Bluegrass - Stiff Dogwood Ruderal Meadow & Shrubland Group

***Colloquial Name:** Eastern North American Ruderal Meadow & Shrubland

***Type Concept:** This group encompasses shrub or herb meadows or old fields in the northern and central regions of the eastern United States and adjacent Canada dominated by native and exotic forbs, grasses, ferns and shrubs that occur on sites that have been cleared and plowed (for farming or development), and then abandoned. Characteristic herbs and shrubs include three variants. Dry variants are less well-described. The mesic open old-field meadow variant has characteristic forbs that include *Asclepias syriaca*, *Cerastium arvense*, *Centaurea stoebe* ssp. *micranthos* (= *Centaurea maculosa*), *Daucus carota*, *Euthamia graminifolia*, *Fragaria virginiana*, *Oenothera biennis*, *Picris hieracioides*, *Potentilla simplex*, *Rudbeckia hirta*, *Solidago altissima*, *Solidago canadensis*, *Solidago nemoralis*, *Solidago rugosa*, *Solidago juncea*, *Symphotrichum lateriflorum* (= *Aster lateriflorus*), and *Symphotrichum novae-angliae* (= *Aster novae-angliae*). Common grasses include *Anthoxanthum odoratum*, *Bromus inermis*, *Dactylis glomerata*, *Elymus repens* (= *Agropyron repens*), *Phleum pratense*, *Poa compressa*, and *Poa pratensis*. Shrubs may be present, but collectively they have less than 25% cover. Characteristic shrubs include *Cornus amomum*, *Cornus racemosa* (= *Cornus foemina* ssp. *racemosa*), *Cornus sericea*, *Juniperus virginiana*, *Lonicera* spp., *Rubus* spp., *Rhus typhina*, *Rhus glabra*, and *Viburnum recognitum*. The mesic old-field shrubland variant includes *Amelanchier* spp., *Cornus racemosa*, *Cornus sericea*, *Crataegus* spp., *Prunus americana*, *Prunus virginiana*, *Rhus glabra*, *Rhus typhina*, *Rubus* spp., *Viburnum lentago*, and *Viburnum recognitum*. The exotic shrubs *Elaeagnus angustifolia*, *Lonicera* spp., *Rhamnus cathartica*, and *Rosa multiflora* may be invasive in some areas. The dry old-field grassland and shrubland is found on sandy or rock substrates and includes *Andropogon virginicus*, *Poa compressa*, *Solidago nemoralis*, *Schizachyrium scoparium*, and an assortment of dry weedy species such as *Centaurea stoebe* ssp. *micranthos*.

***Diagnostic Characteristics:** Occurs on abandoned farmland sites, often in formerly forested sites. Sites contain a mix of native and exotic shrubs and herbs, often with some woody sapling establishment from surrounding forests.

***Classification Comments:** Other natural types that originate through both natural and human disturbances, but have natural analogs are placed in other "natural" groups, such as ~Laurentian-Acadian Acidic Scrub & Grassland Group (G788)\$\$ and ~North-Central Appalachian Acidic Scrub & Grassland Group (G789)\$\$\$. For example, blueberry heaths are dominated by ericaceous shrubs that occur on sites with acidic soils that have been cleared for logging, farming, etc., but can also develop on forest sites with a severe fire or persist for a long time with periodic fire. Another example are the northern and midwestern sandplain grasslands that develop on sandplains that have been cleared and plowed for farming or development, and then abandoned, or they can develop in response to severe fire in native forests, or persist for a long time with periodic fire. A well-studied example are the "old field" sand barrens of the upper Midwest, studied at Cedar Creek Natural History Area (Inouye et al. 1987). They are treated here as "native successional grasslands" within ~Central Tallgrass Prairie Group (G333)\$\$\$, because they are very similar to naturally occurring sand barrens and oak barrens types in the surrounding landscape, within 10-25 years. Examples of these natural sandplain associations include ~*Vaccinium angustifolium* / *Schizachyrium scoparium* - *Carex lucorum* Shrub Grassland (CEGL006393)\$\$\$.

On the flip side, recently harvested crop fields may quickly become very early-successional old fields, dominated by *Ambrosia artemisiifolia*, *Hieracium* spp., *Taraxacum officinale*, etc. Practically speaking, they may be treated as fallow cropland under Cultural Vegetation, as long as a more-or-less continuous cover of vegetation is not present.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G030	Eastern North American Native Ruderal Forest	
G032	Eastern North American Exotic Ruderal Forest	
G583	Southeastern Ruderal Grassland & Shrubland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: The vegetation is dominated by forbs, grasses, ferns and shrubs. Tree saplings may form a growing percentage of the cover should succession lead to a forested state.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This group encompasses shrub or herb meadows in the northern and central regions of the eastern United States dominated by forbs, grasses, ferns and shrubs that occur on sites that have been cleared and plowed (for farming or development), and then abandoned. Characteristic herbs and shrubs include three variants. Dry variants are less well-described.

The mesic old-field meadow variant is dominated by forbs and grasses that occur on sites that have been cleared and plowed (for farming or development), and then abandoned. Forbs include *Asclepias syriaca*, *Cerastium arvense*, *Centaurea stoebe ssp. micranthos* (= *Centaurea maculosa*), *Daucus carota*, *Euthamia graminifolia*, *Fragaria virginiana*, *Oenothera biennis*, *Picris hieracioides*, *Potentilla simplex*, *Rudbeckia hirta*, *Solidago altissima*, *Solidago canadensis*, *Solidago nemoralis*, *Solidago rugosa*, *Solidago juncea*, *Symphyotrichum lateriflorum* (= *Aster lateriflorus*), and *Symphyotrichum novae-angliae* (= *Aster novae-angliae*). Common grasses include *Anthoxanthum odoratum*, *Bromus inermis*, *Dactylis glomerata*, *Elymus repens* (= *Agropyron repens*), *Phleum pratense*, *Poa compressa*, and *Poa pratensis*. Shrubs may be present, but collectively they have less than 25% cover. Characteristic shrubs include *Cornus amomum*, *Cornus racemosa* (= *Cornus foemina ssp. racemosa*), *Cornus sericea*, *Juniperus virginiana*, *Lonicera* spp., *Rubus* spp., *Rhus typhina*, *Rhus glabra*, and *Viburnum recognitum*. The mesic old-field shrubland variant includes *Amelanchier* spp., *Cornus racemosa*, *Cornus sericea*, *Crataegus* spp., *Prunus americana*, *Prunus virginiana*, *Rhus glabra*, *Rhus typhina*, *Rubus* spp., *Viburnum lentago*, and *Viburnum recognitum*. The exotic shrubs *Elaeagnus angustifolia*, *Lonicera* spp., and *Rosa multiflora* may be invasive in some areas (Edinger et al. 2002). The dry old-field grassland and shrubland is found on sandy or rock substrates and includes *Andropogon virginicus*, *Poa compressa*, *Solidago nemoralis*, *Schizachyrium scoparium*, and an assortment of dry weedy species such as *Centaurea stoebe ssp. micranthos*. See also Wright and Fridley (2010) for the biogeographic variation among stands of this type.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Depending on the availability of adjacent seed sources, ongoing mowing, etc., sites may either remain as herb- and shrub-dominated meadows for 20-50+ years, or may succeed to forests. Sites in which *Rhamnus cathartica* establishes may persist in a small-tree state for many years.

ENVIRONMENT

Environmental Description: Sites where this group is found have typically been cleared and plowed (for farming or development), and then abandoned. Mesic sites are typically relatively flat to rolling and fairly moist, because of their desirability for agricultural activities. Drier, sand, rocky or steeper sloped sites are subject to other kinds of development or weedy invasion, and are not well-described.

DISTRIBUTION

***Geographic Range:** This group occurs widely across the northern and central regions of the United States and adjacent Canada, extending westward into the tallgrass region of the midwestern United States.

Nations: CA, US

States/Provinces: CT, DE, IA, IL, IN, KS, KY, MA, MB, MD, ME, MI, MN, MO, NB, NC?, ND, NE, NH, NJ, NS, NY, OH, ON, PA, PE, QC?, RI, SD, TN, VA, VT, WI, WV

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3934	<i>Poa compressa</i> - <i>Solidago nemoralis</i> - <i>Centaurea stoebe ssp. micranthos</i> Ruderal Dry Meadow & Shrubland Alliance
A1190	<i>Dactylis glomerata</i> - <i>Festuca</i> spp. - <i>Solidago canadensis</i> Ruderal Mesic Meadow Alliance
A3935	<i>Rhamnus cathartica</i> - <i>Rosa multiflora</i> - <i>Elaeagnus umbellata</i> Ruderal Mesic Shrubland Alliance
A4246	<i>Rhododendron maximum</i> Ruderal Shrubland Alliance
A0898	<i>Corylus cornuta</i> - <i>Amelanchier</i> spp. / <i>Poa pratensis</i> Ruderal Scrub & Grassland Alliance
A3906	<i>Danthonia spicata</i> - <i>Danthonia compressa</i> - <i>Solidago rugosa ssp. aspera</i> Ruderal Montane Grassland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	Successional old field	Edinger et al. 2002	
<	Successional shrubland	Edinger et al. 2002	
<	Successional fern meadow	Edinger et al. 2002	

AUTHORSHIP

*Primary Concept Source [if applicable]: D. Faber-Langendoen, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: D. Faber-Langendoen and S.C. Gawler

Acknowledgments [optional]:

Version Date: 05 May 2015

REFERENCES

*References [Required if used in text]:

- Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero, editors. 2002. Ecological communities of New York state. Second edition. A revised and expanded edition of Carol Reschke's ecological communities of New York state. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
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2.B.2.Ne. Southeastern North American Grassland & Shrubland (D102)

M307. Southeastern Ruderal Grassland & Shrubland

2. Shrub & Herb Vegetation

2.B.2.Ne. Southeastern North American Grassland & Shrubland

G583. Southeastern Ruderal Grassland & Shrubland

Type Concept Sentence: This is vegetation that occurs on disturbed sites that were cleared and the soils disturbed, including old fields, abandoned quarries, old homesteads, etc. Stands may be dominated by native or exotic species, or combinations of these. *Andropogon virginicus* is often the dominant plant during part of the successional sequence.

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 2.B.2.Ne.90. Southeastern Ruderal Grassland & Shrubland (M307)

Elcode: G583

*Scientific Name: *Andropogon virginicus* var. *virginicus* - *Ambrosia artemisiifolia* - *Rubus argutus* Ruderal Grassland & Shrubland Group

***Common (Translated Scientific) Name:** Broomsedge Bluestem - Annual Ragweed - Sawtooth Blackberry Ruderal Grassland & Shrubland Group

***Colloquial Name:** Southeastern Ruderal Grassland & Shrubland

***Type Concept:** This group comprises vegetation that occurs on disturbed sites that were cleared and the soils disturbed (e.g., old fields, abandoned quarries, old homesteads, etc.). Stands may be composed of native or exotic species, or combinations of these. These are combinations of taxa for which no natural analog exists. In the southeastern Piedmont, the herbs and grasses that dominate old fields undergo a rapid turnover in the first three years after abandonment. By the third year, *Andropogon virginicus* often is the dominant plant. Before it achieves dominance, *Ambrosia artemisiifolia*, *Conyza canadensis*, *Digitaria sanguinalis*, and *Symphotrichum pilosum* may be more prominent. Other perennial grasses may include *Andropogon gyrans*, *Andropogon ternarius*, and *Dichanthelium dichotomum*. Shrubs and vines appear in these communities, and some genera may form stands, including the native genera *Baccharis*, *Cornus*, *Prunus*, *Rubus*, and *Sophora secundiflora* (in Texas), as well as the exotics *Ligustrum*, *Pueraria*, and *Wisteria*. This variation is accommodated at the alliance level within this group, as in the absence of disturbance, small trees rapidly overtake them and become dominant.

***Diagnostic Characteristics:** These are combinations of taxa for which no natural analog exists. Stands may be composed of native or exotic species, or combinations of these. Stands of this group occupy sites that were cleared and the soils disturbed (e.g., old fields, abandoned quarries, old homesteads, etc.).

***Classification Comments:** These are combinations of taxa for which no natural analog exists.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G059	Eastern North American Ruderal Meadow & Shrubland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Stands are dominated by short to tall forbs and graminoids. Some stands may exhibit dominance by shrubs, or a combination of all of these. Examples are highly variable from stand to stand, depending on time since disturbance or abandonment, and the vagaries of weed seed dispersal. They are also heterogeneous within stands, with some components occurring in distinct patches.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: By the third year of succession in Piedmont old fields, *Andropogon virginicus* often is the dominant plant. Before it achieves dominance, *Ambrosia artemisiifolia*, *Conyza canadensis*, *Digitaria sanguinalis*, and *Symphotrichum pilosum* may be more prominent. Other perennial grasses may include *Andropogon gyrans*, *Andropogon ternarius*, and *Dichanthelium dichotomum*. Other herbaceous taxa may include *Antennaria plantaginifolia*, *Bulbostylis capillaris*, *Chamaecrista fasciculata*, *Chamaesyce nutans*, *Cyperus compressus*, *Diodia teres*, *Eragrostis pilosa*, *Fimbristylis autumnalis*, *Gamochoeta purpurea* (= *Gnaphalium purpureum*), *Helenium amarum* (= *Helenium tenuifolium*), *Hypericum drummondii*, *Hypericum gentianoides*, *Ipomoea lacunosa*, *Ipomoea pandurata*, *Juncus tenuis*, *Kummerowia striata* (= *Lespedeza striata*), *Plantago aristata*, *Pseudognaphalium obtusifolium* (= *Gnaphalium obtusifolium*), *Rumex acetosella*, *Solanum carolinense*, and *Solidago* sp. (Oosting 1942). Shrubs and vines appear in these communities, and some genera may form stands, including the native genera *Baccharis*, *Cornus*, *Prunus*, *Rubus*, and *Sophora secundiflora* (in Texas). This variation is accommodated at the alliance level within this group. Under disturbance regimes that inhibit succession to tree-dominated vegetation, these shrubs and vines may form small to large patches. Stands may also be dominated by exotic species, including herbaceous *Cynodon dactylon*, *Imperata cylindrica*, *Lolium* spp. (= *Schedonorus* spp.), *Paspalum notatum*, *Sorghum halepense*, and woody shrubs and vines *Ligustrum sinense*, *Pueraria montana* var. *lobata*, *Wisteria sinensis*, etc. In the case of *Cynodon*, *Lolium*, and *Paspalum*, these may be planted, but other species are accidental introductions.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: In the southeastern Piedmont, the herbs and grasses that dominate old fields undergo a rapid turnover in the first three years after abandonment (Oosting 1942). Shrubs and vines appear in these communities, and may dominate stands, but in some other cases small trees rapidly overtake them and become dominant without disturbance. In drier sites, or under disturbance regimes that inhibit succession to tree-dominated vegetation, shrubs may form small to large patches which can be interpreted as constituting other associations.

ENVIRONMENT

Environmental Description: Stands occur on disturbed land, irrespective of inherent environmental conditions. Soils may be fertile and deep, as these were the primary agricultural lands.

DISTRIBUTION

***Geographic Range:** This vegetation is found across the southeastern United States, in the coastal plains and interior.

Nations: MX?, US

States/Provinces: AL, AR, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A0751	<i>Sophora secundiflora</i> Comanchian Ruderal Shrubland Alliance
A4084	<i>Ligustrum</i> spp. Eastern Exotic Ruderal Shrubland Alliance
A4082	<i>Pueraria montana</i> - <i>Wisteria sinensis</i> Exotic Ruderal Vine-Shrubland Alliance
A4083	<i>Phyllostachys aurea</i> Exotic Ruderal Shrubland Alliance
A3321	<i>Andropogon virginicus</i> - <i>Ambrosia artemisiifolia</i> - <i>Conyza canadensis</i> Eastern Ruderal Grassland Alliance
A3322	<i>Rubus</i> spp. - <i>Prunus</i> spp. - <i>Cornus drummondii</i> Eastern Ruderal Shrubland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
=	Abandoned Fields - Upland	Oosting 1942	

AUTHORSHIP

***Primary Concept Source [if applicable]:** H.J. Oosting (1942)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** M. Pyne

Acknowledgments [optional]: C. Lea

REFERENCES

***References [Required if used in text]:**

- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Oosting, H. J. 1942. An ecological analysis of the plant communities of Piedmont, North Carolina. *The American Midland Naturalist* 28:1-127.

2.B.4.Nb. Pacific North American Coastal Scrub & Herb Vegetation (D027)

M511. North Pacific Coastal Ruderal Grassland & Shrubland

2. Shrub & Herb Vegetation

2.B.4.Nb. Pacific North American Coastal Scrub & Herb Vegetation

G647. North Pacific Maritime Coastal Ruderal Dune

Type Concept Sentence: This group consists of sand dunes and other sandy areas dominated by non-native beachgrasses *Ammophila arenaria* and *Ammophila breviligulata* or restoration areas of planted *Leymus mollis ssp. mollis* (the native dunegrass) from California into British Columbia.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.B.4.Nb.90. North Pacific Coastal Ruderal Grassland & Shrubland (M511)

Elcode: G647

***Scientific Name:** North Pacific Maritime Coastal Ruderal Dune Group

***Common (Translated Scientific) Name:** North Pacific Maritime Coastal Ruderal Dune Group

***Colloquial Name:** North Pacific Maritime Coastal Ruderal Dune

***Type Concept:** This group occurs on shifting sands of outer coastal dunes and other sandy areas at sea level from California to Washington and likely British Columbia. Substrates are entirely eolian sands without horizon development or accumulated organic material. These dunes systems are dominated by, and have been physically modified by, the introduction of non-native beachgrasses *Ammophila arenaria* and *Ammophila breviligulata* or restoration areas of planted *Leymus mollis ssp. mollis* (the native dunegrass). In addition, there are areas of introduced low shrubs such as *Mesembryanthemum* spp. and *Carpobrotus* spp. Several other non-native species may be dominant, but generally are limited to those that can invade and thrive in the shifting sand and salt-spray environment of the coastal sand dunes and sandsheets. With time the sand dunes become stabilize and vegetative cover increases, at which point other invasive species may appear. Other non-native species may also be present, including *Bromus diandrus*, *Cirsium vulgare*, *Poa pratensis*, and *Rumex acetosella*.

***Diagnostic Characteristics:** Stands dominated by non-native, dune obligate species.

***Classification Comments:** *Cytisus* and *Ulex* may be present on sand dunes but they are not limited to them. Do those stands belong to ~Southern Vancouverian Lowland Ruderal Grassland & Shrubland Group (G648)\$. *Lupinus arboreus* was listed; however, this is only introduced in Canada. More information is needed about this species in Canada.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G648	Southern Vancouverian Lowland Ruderal Grassland & Shrubland	is also dominated by non-native species but these are not limited to sand dunes and strictly coastal environs.

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Shrub- or perennial herbaceous-dominated, generally <2 m in height, on sandy soils near the coast.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: These dunes are dominated by non-native beachgrasses *Ammophila arenaria* and *Ammophila breviligulata*, restoration areas of planted *Leymus mollis ssp. mollis* (the native dunegrass), or introduced shrubs such as *Carpobrotus* spp., *Mesembryanthemum* spp., and *Lupinus arboreus* (in Canada only). Often they can be a mosaic of patches of shrubs and grasses. Other non-natives present include *Bromus diandrus*, *Cirsium vulgare*, *Cytisus scoparius*, *Poa pratensis*, *Rumex acetosa*, and/or *Teesdalia nudicaulis*. Native herbaceous species that may be present but with very low abundance include *Abronia latifolia*, *Cakile* spp., *Galium aparine*, *Lathyrus littoralis*, *Poa macrantha*, and *Pteridium aquilinum*. Sparsely scattered native shrubs and trees may also occur, particularly near the landward edge, including *Arctostaphylos columbiana*, *Arctostaphylos uva-ursi*, *Gaultheria shallon*, *Ledum glandulosum*, *Lonicera involucrata*, *Pinus contorta*, *Rosa nutkana*, *Rubus ursinus*, and *Salix hookeriana*. These areas can be dense shrublands totally composed of one species or they can be more open mosaics of grassland and shrubland.

*Floristics Table [Med - High Confidence]:

*Number of Plots:

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: *Ammophila arenaria* is native to Europe and was introduced to stabilize dunes in the 1880s. It rapidly naturalized and became dominant over much of the northern Pacific coast. Dense stands of *Ammophila* created steep foredunes, a landform which was rare in the region prior to 1930 (Weidemann 1966). Native foredune and strand communities are threatened by expansion of this vegetation (Barbour and Major 1977). This ruderal type is found in areas that have experienced recent soil disturbance, i.e., sandy soils that have been exposed to physical disturbances such as grazing (Rocchio et al. 2012). Restoration projects that have planted the West Coast native dunegrass *Leymus mollis ssp. mollis* will remain in this group until they successfully mature into a recognizable native plant association.

Cytisus scoparius is native to Spain and is found in waste places throughout the Pacific Northwest and in California in areas below 1000 m in elevation. This group specifically refers to stands on sand dunes along the immediate coast. Other environments where *Cytisus* spp. stands are found belong to another ruderal group, ~Southern Vancouverian Lowland Ruderal Grassland & Shrubland Group (G648)\$.

ENVIRONMENT

Environmental Description: This group occupies coastal dunes and other sandy areas at sea level. Substrates are entirely eolian sands without horizon development or accumulated organic material. These dunes tend to be higher and more stabilized and therefore more abundant than historically due to the introduction of non-native dunegrass.

DISTRIBUTION

***Geographic Range:** This group occurs on shifting sands of outer coastal dunes and other sandy areas at sea level from California to Washington and likely British Columbia.

Nations: CA, MX?, US

States/Provinces: AK?, BC?, CA, OR, WA

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A2061	<i>Ammophila arenaria</i> Coastal Dunegrass Ruderal Grassland Alliance
A1620	<i>Mesembryanthemum</i> spp. - <i>Carpobrotus</i> spp. Ruderal Grassland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP***Primary Concept Source [if applicable]:** G. Kittel, in Faber-Langendoen et al. (2012)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel

Acknowledgments [optional]:

Version Date: 20 May 2015

REFERENCES***References [Required if used in text]:**

- Barbour, M. G., and J. Major, editors. 1977. Terrestrial vegetation of California. John Wiley and Sons, New York. 1002 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Rocchio, F. J., R. C. Crawford, and C. C. Thompson. 2012. San Juan Island National Historical Park vegetation classification and mapping project. Natural Resource Report NPS/NCCN/NRR--2012/603. National Park Service, Fort Collins, CO. 188 pp.
- Rodriguez, D., K. G. Sikes, T. Keeler-Wolf, G. Kittel, J. Curtis, C. Curley, and J. Evens. 2017. Vegetation classification of Channel Islands National Park. Report to the National Park Service, Fort Collins, CO.
- Wiedemann, A. M. 1966. Contributions to the plant ecology of the Oregon coastal sand dunes. Ph.D. dissertation, Oregon State University, Corvallis. 255 pp.

2.C.3.Ef. Caribbean-Mesoamerican Freshwater Marsh, Wet Meadow & Shrubland (D262)**M891. Caribbean-Mesoamerican Ruderal Freshwater Marsh, Wet Meadow & Shrubland**

2. Shrub & Herb Vegetation

2.C.3.Ef. Caribbean-Mesoamerican Freshwater Marsh, Wet Meadow & Shrubland

G815. Caribbean Ruderal Freshwater Wet Meadow & Marsh

Type Concept Sentence: This ruderal Caribbean group consists of freshwater wet meadows and marshes dominated by exotic and invasive species of *Syzygium jambos*, *Pennisetum purpureum*, and *Cyperus involucratus*, among others.

OVERVIEW***Hierarchy Level:** Group***Placement in Hierarchy:** 2.C.3.Ef.3. Caribbean-Mesoamerican Ruderal Freshwater Marsh, Wet Meadow & Shrubland (M891)

Elcode: G815

Scientific Name:** Caribbean Ruderal Freshwater Wet Meadow & Marsh GroupCommon (Translated Scientific) Name:** Caribbean Ruderal Freshwater Wet Meadow & Marsh Group***Colloquial Name:** Caribbean Ruderal Freshwater Wet Meadow & Marsh***Type Concept:** Species include *Syzygium jambos*, *Pennisetum purpureum*, *Cyperus involucratus* (= *Cyperus alternifolius*), among others***Diagnostic Characteristics:*****Classification Comments:*****Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION**Physiognomy and Structure Summary:****Physiognomy and Structure Table [optional]:**

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:***Floristics Table [Med - High Confidence]:*****Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:**ENVIRONMENT****Environmental Description:****DISTRIBUTION*****Geographic Range:****Nations:** BS, CU, PR, US**States/Provinces:** FL**USFS Ecoregions (2007) [optional]:****Omernik Ecoregions L3, L4 [optional]:****MLRAs [optional]:****PLOT SAMPLING AND ANALYSIS*****Plot Analysis Summary [Med - High Confidence]:*****Plots Used to Define the Type [Med - High Confidence]:****CONFIDENCE LEVEL****USNVC Confidence Level:** Moderate**USNVC Confidence Comments [optional]:**

HIERARCHY***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP***Primary Concept Source [if applicable]:**

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:**

Acknowledgments [optional]:

Version Date: 14 Dec 2015

REFERENCES***References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

2.C.3.Ob. Polynesian-Eastern Melanesian Freshwater Marsh (D019)**M246. Polynesian-Eastern Melanesian Ruderal Freshwater Marsh**

2. Shrub & Herb Vegetation

2.C.3.Ob. Polynesian-Eastern Melanesian Freshwater Marsh

G430. Hawaiian Ruderal Freshwater Wet Meadow & Marsh

Type Concept Sentence: Graminoid- or forb-dominated wetlands dominated by non-native plant species. This include freshwater marshes, riparian areas, ditches, wet drainages, or roadsides where soils remain wet all year.

OVERVIEW***Hierarchy Level:** Group***Placement in Hierarchy:** 2.C.3.Ob.90. Polynesian-Eastern Melanesian Ruderal Freshwater Marsh (M246)

Elcode: G430

Scientific Name:** *Typha latifolia* - *Hedychium* spp. - *Urochloa mutica* Ruderal Freshwater Wet Meadow & Marsh GroupCommon (Translated Scientific) Name:** Broadleaf Cattail - Garland-lily species - Paragrass Ruderal Freshwater Wet Meadow & Marsh Group***Colloquial Name:** Hawaiian Ruderal Freshwater Wet Meadow & Marsh

***Type Concept:** This ruderal freshwater marsh group occurs on the northwestern Hawaiian Islands and throughout the main islands as mostly small-patch areas in floodplain, riparian, or basin topography. Vegetation is dominated by non-native emergent herbs such as *Typha latifolia*, *Hedychium flavescens*, *Hedychium coronarium*, *Hedychium gardnerianum* (above 315 m [1000 feet] in elevation), and *Pluchea indica*. Native species such as bulrushes, sedges and grasses, including *Bolboschoenus maritimus*, *Cladium mariscus*, *Cyperus* spp., and *Schoenoplectus* spp., may be present but are no longer the dominant and characteristic plants of the marsh. These are degraded marshes where introduced species have become overwhelmingly dominant.

***Diagnostic Characteristics:** Vegetation is dominated by introduced species, including *Typha latifolia*, *Hedychium flavescens*, *Hedychium coronarium*, *Hedychium gardnerianum*, *Urochloa mutica*, *Paspalum vaginatum*, *Schoenoplectus californicus*, and the subshrub *Pluchea indica*.

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Vegetation is dominated by exotic emergent herbaceous species.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Vegetation is dominated by emergent herbaceous introduced species, including *Typha latifolia*, *Hedychium flavescens*, *Hedychium coronarium*, *Hedychium gardnerianum* (above 315 m [1000 feet] elevation), *Urochloa mutica* (= *Brachiaria mutica*), *Paspalum vaginatum*, *Schoenoplectus californicus*, and the subshrub *Pluchea indica*. Native bulrushes, sedges and grasses, including *Bolboschoenus maritimus*, as well as forbs such as *Bacopa monnieri* and *Ludwigia octovalvis*, may be present but are not the dominant cover.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description: Freshwater marshes occur as a mostly small-patch group confined to limited areas in floodplain or basin topography. This group occupies estuaries, surrounds open bodies of water, occurs in former ponds, and sometimes along streams and springs. *Climate:* Climate is variable depending on where the stand occurs, ranging from arid to very wet (Zones 1-7) of the 7 Moisture Zones developed for the Hawaiian Islands by Price et al. (2007). *Soil/substrate/hydrology:* Soils range from silty clays to deep gley mucks to loams and sand over less permeable subsoils. Water levels in freshwater marshes fluctuate seasonally, but they usually retain standing water most of the year.

DISTRIBUTION

***Geographic Range:** This ruderal freshwater marsh occurs on the northwestern Hawaiian Islands and throughout the main islands.

Nations: US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL**USNVC Confidence Level:** Moderate**USNVC Confidence Comments [optional]:****HIERARCHY*****Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION**Discussion [optional]:****CONCEPT HISTORY*****Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS**Supporting Concepts [optional]:**

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	Lowland Wet Herbland	Gagne and Cuddihy 1990	
<	Ginger (<i>Hedychium</i>) Herbland	Gagne and Cuddihy 1990	

AUTHORSHIP***Primary Concept Source [if applicable]:** W.C. Gagne and L.W. Cuddihy (1990)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel and K.A Schulz**Acknowledgments [optional]:**

Version Date: 27 May 2016

REFERENCES***References [Required if used in text]:**

- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
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2. Shrub & Herb Vegetation

2.C.3.Ob. Polynesian-Eastern Melanesian Freshwater Marsh

G604. Polynesian Ruderal Freshwater Wet Meadow & Marsh**Type Concept Sentence:****OVERVIEW*****Hierarchy Level:** Group***Placement in Hierarchy:** 2.C.3.Ob.90. Polynesian-Eastern Melanesian Ruderal Freshwater Marsh (M246)

Elcode: G604

***Scientific Name:** Polynesian Ruderal Freshwater Wet Meadow & Marsh Group

***Common (Translated Scientific) Name:** Polynesian Ruderal Freshwater Wet Meadow & Marsh Group

***Colloquial Name:** Polynesian Ruderal Freshwater Wet Meadow & Marsh

***Type Concept:**

***Diagnostic Characteristics:**

***Classification Comments:**

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION

***Geographic Range:**

Nations: GU

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

Author of Description:*Acknowledgments [optional]:**

REFERENCES

***References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

2.C.4.Nb. Western North American Temperate & Boreal Freshwater Marsh, Wet Meadow & Shrubland (D031)

M301. Western North American Ruderal Marsh, Wet Meadow & Shrubland

2. Shrub & Herb Vegetation

2.C.4.Nb. Western North American Temperate & Boreal Freshwater Marsh, Wet Meadow & Shrubland

G524. Western North American Ruderal Marsh, Wet Meadow & Shrubland

Type Concept Sentence: This group contains wet meadows dominated by non-native species such as *Agrostis gigantea*, *Agrostis stolonifera*, *Alopecurus pratensis*, *Conyza canadensis*, *Cirsium arvense*, *Sonchus* spp., *Lactuca serriola*, *Phalaris arundinacea*, *Phragmites australis* ssp. *australis*, *Poa palustris*, and/or *Poa pratensis* that occur in the same physical settings as native wet meadows found throughout the western U.S. and Canada.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.C.4.Nb.90. Western North American Ruderal Marsh, Wet Meadow & Shrubland (M301)

Elcode: G524

***Scientific Name:** *Poa pratensis* - *Conyza canadensis* - *Cirsium arvense* Ruderal Marsh, Wet Meadow & Shrubland Group

***Common (Translated Scientific) Name:** Kentucky Bluegrass - Canadian Horseweed - Canada Thistle Ruderal Marsh, Wet Meadow & Shrubland Group

***Colloquial Name:** Western North American Ruderal Marsh, Wet Meadow & Shrubland

***Type Concept:** This group contains disturbed wet meadows found in lowland, montane and subalpine elevations, occasionally reaching into the lower edges of the alpine elevations (sea level to 3600 m) throughout the western U.S. and Canada. Vegetation is dominated by non-native species such as *Agrostis gigantea*, *Agrostis stolonifera*, *Alopecurus pratensis*, *Bromus inermis*, *Conyza canadensis*, *Cirsium arvense*, *Sonchus* spp., *Lactuca serriola*, *Phalaris arundinacea*, *Phragmites australis* ssp. *australis*, *Poa bulbosa*,

Poa palustris, and *Poa pratensis*. Native species may be present but are so low in abundance that the original native plant association is impossible to determine. These can be wet meadows, wet emergent marshes, coastal backwater dunes, sloughs, open wet depressions, basins and flats with low-velocity surface and subsurface flows. They can be large meadows in montane or subalpine valleys, or occur as narrow strips bordering ponds, lakes, and streams, and along toeslope seeps. They are typically found on flat areas or gentle slopes, but may also occur on subirrigated sites with slopes up to 10%. Sites are usually seasonally wet, often drying by late summer, and many occur in a tension zone between perennial wetlands and uplands, where water tables fluctuate in response to long-term climatic cycles. They may have surface water for part of the year, but depths rarely exceed a few centimeters. Soils are mostly mineral and show typical hydric soil characteristics such as low chroma and redoximorphic features; some areas may have high organic content as inclusions or pockets. Due to disturbance, soils may be compacted.

***Diagnostic Characteristics:** Wet graminoid and forb meadow or marsh dominated by non-native species.

***Classification Comments:** This group may be difficult to tease apart from its native counterpart. The test is that the non-native species far outweigh native species in abundance and richness, such that a well-trained observer cannot tell what the native counterpart may have been or to do so is only speculation. This group does not include actively managed irrigated hay meadows that have been historically seeded. Those belong under ~7 Agricultural & Developed Vegetation Class (CCL01)\$.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G517	Vancouverian Freshwater Wet Meadow & Marsh	is dominated by native species.
G521	Vancouverian-Rocky Mountain Montane Wet Meadow & Marsh	is dominated by native species.
G531	Arid West Interior Freshwater Marsh	
G819	North American Warm Desert Ruderal Scrub	
G677	North American Warm Desert Ruderal Grassland	
G600	Great Basin-Intermountain Ruderal Dry Shrubland & Grassland	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Herbaceous wet meadow dominated by perennial herbs introduced to North America.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Vegetation of this group is dominated by non-native species such as *Agrostis gigantea*, *Agrostis stolonifera*, *Alopecurus pratensis*, *Bromus inermis*, *Conyza canadensis*, *Lactuca serriola*, *Cirsium arvense*, *Iris pseudacorus*, *Phalaris arundinacea*, *Phragmites australis*, *Poa bulbosa*, *Poa palustris*, *Poa pratensis*, *Poa trivialis*, and *Scirpus cyperinus*. Native species may be present but are so low in abundance that the original native plant association is impossible to determine. Floristic information was compiled from Whitson et al. (1996), Rondeau (2001), Faber-Langendoen et al. (2008), and Sawyer et al. (2009).

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: This group is a product of disturbance such as continuous heavy grazing by domestic livestock, soil disturbance/compactions, significant change in hydrologic regime, invasion after natural disturbance such as fire, floods or landslides, and are a combination of infestation by non-native invasive plants, and by diminished or lack of competition by native plants.

ENVIRONMENT

Environmental Description: *Soil/substrate/hydrology:* These wet meadows occur in open wet depressions, basins and flats with low-velocity surface and subsurface flows. They can be large meadows in montane or subalpine valleys, or occur as narrow strips

bordering ponds, lakes, and streams, and along toeslope seeps. They are typically found on flat areas or gentle slopes, but may also occur on subirrigated sites with slopes up to 10%. Sites are usually seasonally wet, often drying by late summer, and many occur in a tension zone between perennial wetlands and uplands, where water tables fluctuate in response to long-term climatic cycles. Some sites occur under an agricultural management regime of seasonal sheet irrigation for grazing or haying purposes, and may bear no resemblance to historical types of the area. They may have surface water for part of the year, but depths rarely exceed a few centimeters. Soils are mostly mineral and show typical hydric soil characteristics such as low chroma and redoximorphic features; some areas may have high organic content as inclusions or pockets. Due to disturbance, soils may be compacted.

This group occurs in the same environmental settings as ~Vancouverian-Rocky Mountain Montane Wet Meadow & Marsh Group (G521)\$\$, ~Vancouverian Freshwater Wet Meadow & Marsh Group (G517)\$\$, and ~Arid West Interior Freshwater Marsh Group (G531)\$\$.

DISTRIBUTION

***Geographic Range:** This group is found throughout the entire western U.S. and Canada.

Nations: CA, US

States/Provinces: AB, AK, BC, CA, CO, ID, MT, NM, NV, OR, SD, TX, WA, WY

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A2020	<i>Sorghum halepense</i> Ruderal Desert Grassland Alliance
A3848	<i>Poa pratensis</i> - <i>Agrostis gigantea</i> - <i>Agrostis stolonifera</i> Ruderal Marsh Alliance
A4217	<i>Salix</i> spp. - <i>Artemisia cana</i> Ruderal Understory Wet Shrubland Alliance
A3847	<i>Phragmites australis</i> ssp. <i>australis</i> - <i>Arundo donax</i> - <i>Typha angustifolia</i> Ruderal Marsh Alliance
A3849	<i>Coryza canadensis</i> - <i>Cirsium arvense</i> - <i>Lactuca serriola</i> Ruderal Wet Meadow Alliance
A3846	<i>Phalaris arundinacea</i> Western Ruderal Marsh Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** D. Faber-Langendoen, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel

REFERENCES

*References [Required if used in text]:

- Buck-Diaz, J., S. Batiuk, and J. M. Evens. 2012. Vegetation alliances and associations of the Great Valley ecoregion, California. California Native Society, Sacramento, CA. [http://cnps.org/cnps/vegetation/pdf/great_valley_eco-vegclass2012.pdf]
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Faber-Langendoen, D., J. Rocchio, P. Comer, G. Kudray, L. Vance, E. Byers, M. Schafale, C. Nordman, E. Muldavin, G. Kittel, L. Sneddon, M. Pyne, and S. Menard. 2008a. Overview of Natural Heritage methodology for ecological Element Occurrence ranking based on ecological integrity assessment methods. Draft for Network review. NatureServe, Arlington, VA.
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- Whitson, T. D., L. C. Burrill, S. A. Dewey, D. W. Cudney, B. E. Nelson, R. D. Lee, R. Parker. 2000. Weeds of the West. The Western Society of Weed Science in cooperation with the Western United States Land Grant Universities, Cooperative Extension Services. University of Wyoming, Laramie. 630 pp.

2.C.4.Nd. Eastern North American Temperate & Boreal Freshwater Marsh, Wet Meadow & Shrubland (D323)

M303. Eastern-Southeastern North American Ruderal Marsh, Wet Meadow & Shrubland

2. Shrub & Herb Vegetation

2.C.4.Nd. Eastern North American Temperate & Boreal Freshwater Marsh, Wet Meadow & Shrubland

G557. Southeastern Ruderal Marsh, Wet Meadow & Shrubland

Type Concept Sentence: These ruderal herbaceous and shrub wetlands tend to be dominated by *Andropogon glomeratus*, *Juncus effusus*, and exotic plant species, such as the exotic shrub *Ligustrum sinense* or exotic grasses *Pennisetum purpureum* or *Arundo donax*. Included here are wetlands disturbed by vehicles or equipment.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 2.C.4.Nd.90. Eastern-Southeastern North American Ruderal Marsh, Wet Meadow & Shrubland (M303)

Elcode: G557

***Scientific Name:** *Andropogon glomeratus* - *Juncus effusus* Ruderal Marsh, Wet Meadow & Shrubland Group

***Common (Translated Scientific) Name:** Bushy Bluestem - Common Rush Ruderal Marsh, Wet Meadow & Shrubland Group

***Colloquial Name:** Southeastern Ruderal Marsh, Wet Meadow & Shrubland

***Type Concept:** These are herbaceous wetlands which are characterized by ruderal conditions or dominance by exotic plant species. Also included here are wetlands which may have been severely disturbed by vehicles or equipment, such as coastal plain depressions which have been subjected to intensive forest management (i.e., bedded and site-prepped) and ponds used by recreational off-road vehicles. These ruderal herbaceous and shrub wetlands tend to be dominated by *Andropogon glomeratus*, *Juncus effusus*, and exotic plant species, such as the exotic shrub *Ligustrum sinense* or exotic grasses *Pennisetum purpureum* or *Arundo donax*.

***Diagnostic Characteristics:** *Andropogon glomeratus* and *Juncus effusus* are typical native graminoid species which are found in ruderal wet meadows and marshes. These are herbaceous wetlands which are characterized by ruderal conditions or dominance by exotic plant species. Examples would include wetlands dominated by the exotic grasses *Pennisetum purpureum* or *Arundo donax*. Also included here are wetlands which may have been severely disturbed by vehicles or equipment, such as coastal plain depressions which have been subjected to intensive forest management (i.e., bedded and site-prepped) and ponds used by

recreational off-road vehicles.

***Classification Comments:** These herbaceous wetlands are characterized by ruderal conditions or dominance by exotic plant species.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G129	South Florida Freshwater Marsh & Wet Prairie	
G556	Eastern Ruderal Wet Meadow & Marsh	
G188	Atlantic & Gulf Coastal Plain River & Basin Freshwater Marsh	
G111	Atlantic & Gulf Coastal Plain Pondshore & Wet Prairie	
G187	Atlantic & Gulf Coastal Plain Seep	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: These are herbaceous wetlands which are characterized by graminoid or forb vegetation. The vegetation can include low shrubs as well.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: *Andropogon glomeratus* and *Juncus effusus* are typical native graminoid species which are found in ruderal wet meadows and marshes. This group also includes wetlands dominated by the exotic grasses *Pennisetum purpureum* or *Arundo donax*. Exotic shrub-dominated wetland vegetation is also included here, such as *Ligustrum sinense*- and *Tamarix* spp.-dominated vegetation. This does not include tall shrubs such as *Triadica sebifera*. Also, there is ruderal vegetation dominated by annual plants in open canopy flood zones which are exposed and even dry during the summer. This includes drawdown zones of reservoirs and other wetland habitats. Broadleaf exotic emergent wetland plants are also included here, including *Colocasia esculenta* wetland vegetation.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Const-ancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: These wetlands are subject to natural disturbances, such as flooding or hurricanes. Many sites have been subjected to anthropogenic disturbance or are dominated by invasive exotic plants.

ENVIRONMENT

Environmental Description: Wetlands, which may occur along rivers and creeks, or on extensive flats, or in depressions. *Climate:* Warm temperate. *Soil/substrate/hydrology:* Generally the vegetation is on hydric soils. Sites have often been disturbed, either from natural processes, such as flooding, or anthropogenic actions. Due to their aggressive nature, the dominant species in this group do not require disturbance to remove native species before invading an area.

DISTRIBUTION

***Geographic Range:** This group occurs in the south-central and southeastern United States from North Carolina to Florida, west to Tennessee, Arkansas, Louisiana and Texas.

Nations: MX, US

States/Provinces: AL, AR, FL, GA, KY, LA, MS, MXTM?, NC, OK, SC, TN, TX, VA, WV

USFS Ecoregions (2007) [optional]: 221:C, 223:C, 231:C, 232:C, 234:C, M223:C, M231:C

Omernik Ecoregions L3, L4 [optional]: 8.3.3.71:C, 8.3.4.45:C, 8.3.5.65:C, 8.3.6.74:C, 8.3.7.35:C, 8.4.5.39:C, 8.4.6.38:C, 8.4.7.37:C, 8.4.8.36:C, 8.4.9.68:C, 8.5.1.63:C, 8.5.2.73:C, 8.5.3.75:C

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name
A4151	<i>Vitis rotundifolia</i> - <i>Nekemias arborea</i> - <i>Campsis radicans</i> Ruderal Vine-Shrubland Alliance
A3033	<i>Ludwigia leptocarpa</i> Ruderal Wet Meadow Alliance
A3411	<i>Rotala ramosior</i> - <i>Eleocharis obtusa</i> - <i>Fimbristylis autumnalis</i> Annual Ruderal Wet Meadow Alliance
A3413	<i>Arthraxon hispidus</i> - <i>Cyperus entrerianus</i> - <i>Pennisetum purpureum</i> Ruderal Marsh Alliance
A3409	<i>Ligustrum sinense</i> - <i>Tamarix</i> spp. Southern Ruderal Wet Shrubland Alliance
A3410	<i>Colocasia esculenta</i> - <i>Ludwigia grandiflora</i> ssp. <i>hexapetala</i> Ruderal Marsh Alliance
A3412	<i>Juncus effusus</i> - <i>Andropogon glomeratus</i> var. <i>pumilus</i> - <i>Saccharum giganteum</i> Ruderal Marsh Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	Palustrine Emergent Wetlands	Cowardin et al. 1979	

AUTHORSHIP

*Primary Concept Source [if applicable]: C. Nordman, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: C. Nordman

Acknowledgments [optional]:

Version Date: 19 May 2015

REFERENCES

*References [Required if used in text]:

- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. USDI Fish & Wildlife Service, Office of Biological Services, Washington, DC. 103 pp.
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2. Shrub & Herb Vegetation

2.C.4.Nd. Eastern North American Temperate & Boreal Freshwater Marsh, Wet Meadow & Shrubland

G556. Eastern Ruderal Wet Meadow & Marsh

Type Concept Sentence: This group is found in the eastern half of cool-temperate North America where heavily disturbed emergent wetlands are dominated by exotic or weedy native species such as *Lythrum salicaria*, *Phalaris arundinacea*, *Phragmites australis* ssp. *australis*, *Polygonum cuspidatum*, and *Typha* spp.

OVERVIEW

*Hierarchy Level: Group

***Placement in Hierarchy:** 2.C.4.Nd.90. Eastern-Southeastern North American Ruderal Marsh, Wet Meadow & Shrubland (M303)

Elcode: G556

***Scientific Name:** *Phalaris arundinacea* - *Phragmites australis* - *Typha angustifolia* Ruderal Wet Meadow & Marsh Group

***Common (Translated Scientific) Name:** Reed Canarygrass - Common Reed - Narrowleaf Cattail Ruderal Wet Meadow & Marsh Group

***Colloquial Name:** Eastern Ruderal Wet Meadow & Marsh

***Type Concept:** This group includes heavily disturbed marshes and wet meadows in the eastern half of the United States north of a line running from North Carolina to Arkansas, which are usually dominated or at least have a strong component of exotic species. This group is composed of herbaceous-dominated, seasonal to semipermanently flooded wetlands. Sites often have a history of significant disturbance such as heavy pasturing, chemical and soil run-off from nearby fields or developed areas, or alteration in hydrologic regimes. Along with the wide range in flooding regimes, there can be a wide variety of dominant species, some of which can form near monocultures. Some common dominants include *Lythrum salicaria*, *Phalaris arundinacea*, *Phragmites australis*, *Polygonum cuspidatum*, and *Typha* spp.

***Diagnostic Characteristics:** This group is composed of herbaceous-dominated, seasonal to semipermanently flooded wetlands. Along with the wide range in flooding regimes, there can be a wide variety of dominant species, some of which can form near monocultures. The key distinction between this group and other herbaceous wetlands in the same region is the dominance by ruderal, and often exotic, species and very often a significant disturbance to the natural ecological dynamics of the site.

***Classification Comments:** The general cut-off for this group is >75% relative cover by invasive species. At this point, the stand is judged to have lost any real natural character.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G557	Southeastern Ruderal Marsh, Wet Meadow & Shrubland	
G325	Great Plains Freshwater Marsh	
G771	Laurentian-Northeastern Wet Meadow	
G336	Great Plains Wet Prairie, Wet Meadow & Seepage Fen	
G770	Midwest Wet Prairie & Wet Meadow	
G125	Eastern North American Freshwater Marsh	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: These marshes and wet meadows are dominated by herbaceous species but are variable in physiognomy. Sites can have relatively sparse and low (0.5 m) to very dense and tall (2 m) vegetation.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This group can have a wide variety of dominant and associate species depending on geography, disturbance history, local seed sources, hydrology, and other factors. Many are aggressive species, and low diversity or nearly monotypic stands are not uncommon. *Phalaris arundinacea*, *Phragmites australis*, *Typha angustifolia*, and *Typha x glauca* commonly form dense stands. Other species commonly present to abundant include *Butomus umbellatus*, *Hesperis matronalis*, *Iris pseudacorus*, *Juncus effusus*, *Lythrum salicaria*, *Lysimachia nummularia*, *Myosotis scorpioides*, *Polygonum cuspidatum*, and *Solidago rugosa*. Some species more typical of natural/ruderal marshes are often found in small to moderate amounts. The most common ones are those that can survive in a setting with other aggressive species and often on disturbed sites. *Calamagrostis canadensis*, *Leersia oryzoides*, and *Typha latifolia* are common. Woody species are absent to uncommon but where present typically include *Alnus* spp. (in the north), *Cornus* spp., and *Salix* spp.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Hydrologic variation, increased flooding or drying, can have a great impact on these sites. The variation may be the result of natural causes or, because many sites are significantly impacted by human activities, anthropogenic in origin (flooding or drawing down impoundments, construction activity, etc.).

ENVIRONMENT

Environmental Description: Examples of this group occur in basins, either artificial or natural, along lakeshores or pondshores, or sometimes along slow-moving rivers or streams. They are flooded for at least some portion of the growing season. Flooding can range from short, shallow flooding that dries out during the growing season to semipermanent flooding where surface water is present year-round most years. Sites have often been disturbed, either from natural processes, such as flooding, or anthropogenic actions. Due to their aggressive nature, the dominant species in this group do not require disturbance to remove native species before invading an area. Most sites are eutrophic, either naturally or as a result of increased nutrient input from agricultural or urban sources.

DISTRIBUTION

***Geographic Range:** This group is widespread across the northern and central United States from the Atlantic Ocean to the Great Plains and from Virginia and Missouri north into southern Canada. It likely extends into North Carolina, Tennessee, and possibly Georgia in the Appalachian Mountains.

Nations: CA, US

States/Provinces: CT, DE, GA?, IA, IL, IN, KY, MA, MD, ME, MI, MN, MO, NB, NC, NH, NJ, NS, NY, OH, ON, PA, PE, QC, RI, TN, VA, VT, WI, WV

USFS Ecoregions (2007) [optional]: 211A:C, 211B:CC, 211C:CC, 211D:CC, 211E:CC, 211F:CC, 211I:CP, 211J:CC, 212H:CC, 212J:CC, 212K:CC, 212L:CC, 212M:CC, 212N:CC, 221A:CC, 221E:CC, 221F:CC, 221H:CC, 222H:CC, 222I:CC, 222J:CC, 222K:CC, 222L:CC, 222M:CC, 222N:CP, 223A:CC, 223D:CC, 223E:CC, 223F:CC, 223G:CC, 231A:CC, 231H:CC, 232A:CC, 232B:CC, 232C:CC, 251C:CC, 251D:CC, 251E:CP, M211A:CP, M211B:CP, M211C:CP, M211D:CP, M221A:CP, M221B:CP, M221C:CP, M221D:CP

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Low

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A1381	<i>Phalaris arundinacea</i> Eastern Ruderal Marsh Alliance
A2005	<i>Polygonum cuspidatum</i> Ruderal Wet Meadow Alliance
A1431	<i>Phragmites australis</i> ssp. <i>australis</i> Ruderal Marsh Alliance
A3030	<i>Lythrum salicaria</i> Ruderal Marsh Alliance
A4106	<i>Spiraea tomentosa</i> - <i>Rubus</i> spp. Ruderal Wet Shrubland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: J. Drake, in Faber-Langendoen et al. (2011)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: J. Drake

Acknowledgments [optional]: Sean Basquill

Version Date: 19 May 2015

REFERENCES

*References [Required if used in text]:

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

2.C.5.Wf. Tropical Indo-Pacific Coastal Salt Marsh (D038)

M250. Indo-Pacific Ruderal Coastal Salt Marsh

2. Shrub & Herb Vegetation

2.C.5.Wf. Tropical Indo-Pacific Coastal Salt Marsh

G433. Hawaiian Ruderal Coastal Salt Marsh

Type Concept Sentence: Hawaiian disturbed or damaged tidal salt marshes dominated by the non-native scrub *Batis maritima*.

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 2.C.5.Wf.90. Indo-Pacific Ruderal Coastal Salt Marsh (M250)

Elcode: G433

*Scientific Name: *Atriplex semibaccata* - *Batis maritima* Hawaiian Ruderal Coastal Salt Marsh Group

*Common (Translated Scientific) Name: Australian Saltbush - Turtleweed Hawaiian Ruderal Coastal Salt Marsh Group

*Colloquial Name: Hawaiian Ruderal Coastal Salt Marsh

*Type Concept: These are disturbed or damaged intertidal salt marshes and surrounding saline shallow ponds found throughout the coastal areas of the main Hawaiian Islands. Non-native species are the dominant canopy cover with low scrub species such as *Batis maritima*. They are generally species-poor, although other non-natives are present as well as remnant native species. The vegetation is of low scrub, generally less than 0.25 m tall.

*Diagnostic Characteristics:

*Classification Comments: This group likely displaces native salt marsh communities such as *Sesuvium* (Gagne and Cuddihy 1990).

*Similar NVC Types [if applicable]:

Elcode	Scientific or Colloquial Name	Note
G423	Polynesian Ruderal Scrub & Herb Coastal Strand	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Low scrub <1 m in height.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: Non-native species are the dominant canopy cover with *Batis maritima*, *Pluchea indica*, and *Atriplex semibaccata*. Other non-native species in salt marsh areas include *Achyranthes aspera*, *Cenchrus echinatus*, *Chloris barbata* (= *Chloris inflata*), *Cressa truxillensis*, *Paspalum vaginatum*, and *Reichardia tingitana*. Native species may be present, but at very low abundances, including *Cyperus* spp., *Eleocharis* spp., *Fimbristylis cymosa*, *Ipomoea pes-caprae*, *Sesuvium portulacastrum*, and *Vigna marina*.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description: Salt marshes are defined by high salinity soil and soil water and tidal inundation by seawater daily. Salt marshes occur on silt, sand, or coralline substrates, and on the main islands in depressions and on mudflats adjacent to ponds, and lagoons. Salinity is determined by the ratio of freshwater inflows from streams and groundwater versus the amount of seawater inflows. Marshes on the leeward side of the island typically have higher salinity due to less freshwater influence, while windward salt marshes are less saline due to greater rainfall and more freshwater inputs. Salt marshes occur as small patches at mouths of streams and in depressions behind beaches and rocky shorelines with a hydrologic surface connection to the ocean.

Climate: Climate is warm, tropical. *Soil/substrate/hydrology:* Substrates include mud and silt that are saline, and influenced by tides.

DISTRIBUTION

***Geographic Range:** This ruderal salt marsh group occurs throughout the coastal areas of the main Hawaiian Islands.

Nations: US

States/Provinces: HI

USFS Ecoregions (2007) [optional]: M423:C

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: High

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
=	Pickleweed (<i>Batis</i>) Marsh	Gagne and Cuddihy 1990	

AUTHORSHIP

*Primary Concept Source [if applicable]: W.C. Gagne and L.W. Cuddihy (1990)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: G. Kittel

Acknowledgments [optional]:

Version Date: 27 May 2016

REFERENCES

*References [Required if used in text]:

- Canfield, J. E. 1990. Description and map of the plant communities of the Kaloko-Honokohau National Cultural Park. University of Hawaii Cooperative National Park Resources Studies Unit Technical Report 73, Department of Botany, University of Hawaii, Honolulu. 29 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Gagne, W. C., and L. W. Cuddihy. 1990. Vegetation. Pages 45-114 in: W. L. Wagner, D. R. Herbst, and S. H. Sohmer, editors. Manual of the Flowering Plants of Hawaii. 2 volumes. University of Hawaii Press, Honolulu.
- Mueller-Dombois, D., and F. R. Fosberg. 1998. Vegetation of the tropical Pacific islands. Springer-Verlag, New York. 733 pp.

2. Shrub & Herb Vegetation

2.C.5.Wf. Tropical Indo-Pacific Coastal Salt Marsh

G434. West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Coastal Salt Marsh

Type Concept Sentence:

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 2.C.5.Wf.90. Indo-Pacific Ruderal Coastal Salt Marsh (M250)

Elcode: G434

*Scientific Name: West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Coastal Salt Marsh Group

*Common (Translated Scientific) Name: West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Coastal Salt Marsh Group

*Colloquial Name: West Pacific (East Melanesia, Micronesia, Polynesia) Ruderal Coastal Salt Marsh

*Type Concept:

*Diagnostic Characteristics:

*Classification Comments:

*Similar NVC Types [if applicable]:

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

*Floristics Table [Med - High Confidence]:

*Number of Plots:

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION

*Geographic Range:

Nations:

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

*Plot Analysis Summary [Med - High Confidence]:

*Plots Used to Define the Type [Med - High Confidence]:

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:**

Acknowledgments [optional]:

REFERENCES

***References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

3.A.2.Na. North American Warm Desert Scrub & Grassland (D039)

M512. North American Warm Desert Ruderal Scrub & Grassland

3. Desert & Semi-Desert

3.A.2.Na. North American Warm Desert Scrub & Grassland

G677. North American Warm Desert Ruderal Grassland

Type Concept Sentence: This broadly defined ruderal group occurs in Arizona and northern Mexico and includes all exotic-dominated herbaceous stands without a shrub layer. Characteristic understory species include *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Eragrostis lehmanniana*, *Erodium cicutarium*, and *Schismus barbatus*. [For LANDFIRE ReMap, this group is combined with G819, and is called "North American Warm Desert Ruderal & Planted Scrub & Grassland" \(EVT code 9310\).](#)

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 3.A.2.Na.90. North American Warm Desert Ruderal Scrub & Grassland (M512)

Elcode: G677

***Scientific Name:** *Eragrostis lehmanniana* - *Bromus rubens* - *Brassica tournefortii* Warm Desert Ruderal Grassland Group

***Common (Translated Scientific) Name:** Lehmann's Lovegrass - Red Brome - Asian Mustard Warm Desert Ruderal Grassland Group

***Colloquial Name:** North American Warm Desert Ruderal Grassland

***Type Concept:** This broadly defined ruderal group occurs in Arizona and northern Mexico and elsewhere in the Desert Southwest. It includes all desert scrub with an exotic species-dominated understory (>90% relative cover) in the herbaceous layer as well as exotic-dominated herbaceous stands. These open to dense grasslands and forblands are composed of either exotic annual or biennial grasses or forbs with low cover of perennial species (<10% absolute cover) or stands with a significant perennial herbaceous layer (>10% absolute cover) strongly dominated by exotics (>90% relative cover) with or without annuals and biennials present to dominant. Characteristic understory species include *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Cynodon dactylon*, *Eragrostis lehmanniana*, *Erodium cicutarium*, *Schismus arabicus*, *Schismus barbatus*, and *Sorghum halepense* with little native composition remaining. Other woody species may include *Calliandra eriophylla*, *Gutierrezia sarothrae*, or *Isocoma tenuisecta*. *Gutierrezia microcephala* is abundant in some stands. Remnant native desert grasses may be present with low cover. Other common herbaceous species include *Allionia incarnata*, *Ambrosia confertiflora*, *Boerhavia erecta*, *Mollugo verticillata*, *Cylindropuntia versicolor* (= *Opuntia versicolor*), *Panicum hirticaule*, *Polygala barbeyana*, *Proboscidea parviflora*, and *Phemeranthus aurantiacus* (= *Talinum aurantiacum*). The native annual forb *Amaranthus palmeri* often codominates. This desert grassland and shrubland group occurs in southeastern Arizona on alluvial fans, ridges, hills and valley floors. The elevation range is 960-1100 m (3150-3600 feet). Climate is warm, semi-arid to arid continental. Mean annual precipitation ranges from 22-28 cm, but can vary greatly from year to year. Drought is not uncommon. Sites occur on gentle to moderate slopes. Substrates are variable but are often well-drained sandy loam.

***Diagnostic Characteristics:** This broadly defined upland ruderal group occurs in a warm, semi-arid climate in Arizona and northern Mexico and includes open to dense grasslands and forblands that are composed of either exotic annual or biennial grasses or forbs with low cover of perennial species (<10% absolute cover) or stands with a significant perennial herbaceous layer (>10% absolute cover) strongly dominated by exotics (>90% relative cover) with or without annuals and biennials present to dominant. Characteristic understory species include *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Cynodon dactylon*, *Eragrostis lehmanniana*, *Erodium cicutarium*, *Schismus arabicus*, *Schismus barbatus*, and *Sorghum halepense* with little

native composition remaining. The ruderal native annual forb *Amaranthus palmeri* often dominates or codominates disturbed stands.

***Classification Comments:** Some of the characteristic species are shared with other ruderal types; however, this type is restricted to warm deserts and the transition zone with the southern Great Basin. *Sorghum halepense* and *Cynodon dactylon* grow best in mesic conditions. Stands dominated by these species that occur in riparian areas are not included in this group.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G624	Western North American Interior Ruderal Grassland & Shrubland	has similar ruderal alliances but rather than occurring in cool, semi-arid sites, stands occur in cool, temperate regions and include montane, subalpine and alpine areas. Vegetation lacks obligate wetland species and is not dominated by facultative wetland species.
G648	Southern Vancouverian Lowland Ruderal Grassland & Shrubland	may include similar alliances, but is restricted to lowlands west of the Cascade Range.
G524	Western North American Ruderal Marsh, Wet Meadow & Shrubland	has similar ruderal alliances but occurs on mesic to wet sites and vegetation either includes obligate wetland species or is dominated by facultative wetland species.
G600	Great Basin-Intermountain Ruderal Dry Shrubland & Grassland	may include similar alliances, but is restricted to cool, semi-arid desert regions.

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: The physiognomy of this group includes grasslands and forblands with a sparse to dense, annual- or perennial-dominated herbaceous layer.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This broadly defined ruderal group includes open to dense grasslands and forblands that are composed of either exotic annual or biennial grasses or forbs with low cover of perennial species (<10% absolute cover) or stands with a significant perennial herbaceous layer (>10% absolute cover) strongly dominated by exotics (>90% relative cover) with or without annuals and biennials present to dominant. Characteristic understory species include *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Cynodon dactylon*, *Eragrostis lehmanniana*, *Erodium cicutarium*, *Panicum antidotale*, *Schismus arabicus*, *Schismus barbatus*, and *Sorghum halepense* with little native composition remaining. Other woody species may include *Calliandra eriophylla*, *Gutierrezia sarothrae*, or *Isocoma tenuisecta*. *Gutierrezia microcephala* is abundant in some stands. Remnant desert grasses include *Aristida ternipes*, *Bouteloua chondrosioides*, *Bouteloua curtipendula*, *Bouteloua eriopoda*, *Bouteloua rothrockii*, *Digitaria californica*, and *Eragrostis intermedia*. Other common herbaceous species include *Allionia incarnata*, *Ambrosia confertiflora*, *Boerhavia erecta*, *Mollugo verticillata*, *Cylindropuntia versicolor* (= *Opuntia versicolor*), *Panicum hirticaule*, *Polygala barbeyana*, *Proboscidea parviflora*, and *Phemeranthus aurantiacus* (= *Talinum aurantiacum*). Other associated species such as *Chenopodium berlandieri*, *Chloris virgata*, *Eragrostis cilianensis*, *Eragrostis pectinacea*, *Eriochloa acuminata*, *Ipomoea* spp., *Kallstroemia grandiflora*, *Leptochloa panicea* ssp. *brachiata* (= *Leptochloa filiformis*), *Salsola kali*, and *Solanum elaeagnifolium* are often present. The ruderal native annual forb *Amaranthus palmeri* often dominates or codominates disturbed stands.

Floristics Table [Med - High Confidence]:**Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:**ENVIRONMENT**

Environmental Description: This desert grassland group is found in Arizona in areas that were formerly mixed desert grasslands, in northern Mexico, and possibly in New Mexico and Texas. Elevations range from 960-1100 m (3150-3600 feet). Climate is arid to semi-arid with hot summers. Mean annual precipitation ranges from 22-28 cm, but can vary greatly from year to year. Drought is not uncommon. Annual precipitation has bimodal distribution with the proportion of summer precipitation decreasing westward (Barbour and Major 1977). At Tucson, Arizona, about half of the annual rain falls during July to October with the balance during the winter months. The most arid season is late spring and early summer. The summer rain often occurs as high-intensity convective storms. Stands occur on alluvial fans, ridges, hills and valley floors. Sites occur on gentle and moderate slopes to flats and basins that may be intermittently flooded. Substrates are variable and range from well-drained sandy loam to finer-textured silt loam or clays.

DISTRIBUTION

***Geographic Range:** This ruderal desert grassland group occurs in Arizona and possibly New Mexico and Texas in areas that were formerly mixed desert grasslands. It likely occurs in northern Mexico and is presumably widespread in agricultural areas in this warm semi-arid region.

Nations: MX?, US

States/Provinces: AZ, CA, MXCH?, MXSO?, NM?, NV, TX?

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4081	<i>Cynodon dactylon</i> Ruderal Desert Grassland Alliance
A0878	<i>Cylindropuntia imbricata</i> Ruderal Cacti Scrub Alliance
A3873	<i>Pennisetum setaceum</i> - <i>Pennisetum ciliare</i> Ruderal Grassland Alliance
A4166	<i>Brassica tournefortii</i> - <i>Malcolmia africana</i> Ruderal Desert Forbs Alliance
A2687	<i>Eragrostis lehmanniana</i> - <i>Eragrostis curvula</i> Ruderal Desert Grassland Alliance
A4121	<i>Bromus rubens</i> - <i>Schismus arabicus</i> - <i>Schismus barbatus</i> Ruderal Desert Grassland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note
2013-07-09	G676 Mojave-Sonoran Semi-natural Grassland Group	G676 merged into G677

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: K.A. Schulz, in Faber-Langendoen et al. (2015)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: K.A. Schulz

Acknowledgments [optional]:

Version Date: 06 Nov 2015

REFERENCES

*References [Required if used in text]:

- Barbour, M. G., and J. Major, editors. 1977. Terrestrial vegetation of California. John Wiley and Sons, New York. 1002 pp.
- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Rodriguez, D., K. G. Sikes, T. Keeler-Wolf, G. Kittel, J. Curtis, C. Curley, and J. Evens. 2017. Vegetation classification of Channel Islands National Park. Report to the National Park Service, Fort Collins, CO.

3. Desert & Semi-Desert

3.A.2.Na. North American Warm Desert Scrub & Grassland

G819. North American Warm Desert Ruderal Scrub

Type Concept Sentence: This broadly defined ruderal group occurs in Arizona, New Mexico, western Texas and northern Mexico and includes upland desert scrub dominated by exotic shrub species such as *Caesalpinia gilliesii* or invasive native species (*Prosopis glandulosa* and *Prosopis velutina*) with >90% relative cover and >10% absolute shrub cover. Also included are any desert scrub with an herbaceous layer strongly dominated by an exotic herbaceous species (>90% relative cover). Characteristic exotic understory species include *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Cynodon dactylon*, *Centaurea* spp., *Eragrostis lehmanniana*, *Erodium cicutarium*, and *Schismus barbatus*. [For LANDFIRE ReMap, this group is combined with G677, and is called "North American Warm Desert Ruderal & Planted Scrub & Grassland" \(EVT code 9310\).](#)

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 3.A.2.Na.90. North American Warm Desert Ruderal Scrub & Grassland (M512)

Elcode: G819

*Scientific Name: *Prosopis glandulosa* - *Prosopis velutina* Warm Desert Ruderal Scrub Group

*Common (Translated Scientific) Name: Honey Mesquite - Velvet Mesquite Warm Desert Ruderal Scrub Group

*Colloquial Name: North American Warm Desert Ruderal Scrub

*Type Concept: This broadly defined ruderal scrub group occurs in Arizona, New Mexico, western Texas, northern Mexico and elsewhere in the Desert Southwest. It includes upland desert scrub dominated by invasive native species (*Prosopis glandulosa* and *Prosopis velutina*) with >95% relative cover and >10% absolute shrub cover that has become widespread in the last century. However, *Prosopis* spp.-dominated stands that occur naturally (non-ruderal) in desert lowlands, drainages, washes and riparian areas (bosque) are excluded from this ruderal type. Also included in this ruderal group are stands dominated by exotic shrubs such as *Caesalpinia gilliesii*, as well as any disturbed desert scrub with an herbaceous layer strongly dominated by exotic species (>90% relative cover), such that the former natural community cannot be determined. Characteristic understory species of the upland ruderal mesquite (*Prosopis* spp.) stands include native desert graminoids that were part of the former native upland vegetation invaded by mesquite. Many exotic species may dominate ruderal stands such as *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Centaurea* spp., *Cynodon dactylon*, *Eragrostis lehmanniana*, *Erodium cicutarium*, *Schismus arabicus*, *Schismus barbatus*, and *Sisymbrium altissimum*. Stands occur in southeastern Arizona on alluvial fans, ridges, hills and valley floors. The elevation range is 960-1100 m (3150-3600 feet). Climate is warm, semi-arid to arid continental. Mean annual precipitation ranges from 22-28 cm, but can vary greatly from year to year. Drought is not uncommon. Sites occur on gentle to moderate slopes. Substrates are variable but are often well-drained sandy loam.

*Diagnostic Characteristics: This broadly defined upland ruderal group occurs in a warm, semi-arid climate in the southwestern U.S. and northern Mexico and includes upland mesquite and all desert scrub with an exotic species-dominated understory (>90% relative

cover) in the herbaceous layer of at least 10% cover. Characteristic understory species include *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Cynodon dactylon*, *Eragrostis lehmanniana*, *Erodium cicutarium*, *Schismus arabicus*, *Schismus barbatus*, and *Sorghum halepense* with little native composition remaining. Other woody species may include *Calliandra eriophylla*, *Gutierrezia sarothrae*, or *Isocoma tenuisecta*. The ruderal native annual forb *Amaranthus palmeri* often dominates or codominates disturbed stands.

***Classification Comments:** Heavy grazing in the late 1800s and early 1900s, altered fire regime, climate change, desertification and other factors are thought to have caused mesquite to invade and dominate the upland grasslands where it did not previously occur. Naturally occurring coppice dunes may have been present locally in areas peripheral to active dunes. However, the coppice dunes in the Tularosa Basin and elsewhere are currently extensive, resulting from sand movement due to degradation of desert grasslands. Some of the characteristic species are shared with other ruderal types; however, this type is restricted to warm deserts and the transition zone with the southern Great Basin. Most shrub plots have a native overstory with an exotic herbaceous understory. Most stands of this type are the invasive upland *Prosopis* spp. scrub with or without an exotic herbaceous understory. *Sorghum halepense* and *Cynodon dactylon* grow best in mesic conditions. Stands dominated by these species that occur in riparian areas are not included in this group.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G624	Western North American Interior Ruderal Grassland & Shrubland	has similar ruderal alliances but rather than occurring in cool, semi-arid sites, stands occur in cool, temperate regions and include montane, subalpine and alpine areas. Vegetation lacks obligate wetland species and is not dominated by facultative wetland species.
G648	Southern Vancouverian Lowland Ruderal Grassland & Shrubland	may include similar alliances, but is restricted to lowlands west of the Cascade Range.
G524	Western North American Ruderal Marsh, Wet Meadow & Shrubland	has similar ruderal alliances but occurs on mesic to wet sites and vegetation either includes obligate wetland species or is dominated by facultative wetland species.
G490	Chihuahuan Desert Foothill-Piedmont & Lower Montane Grassland	
G288	Chihuahuan Creosotebush - Mixed Desert Scrub	
G287	Chihuahuan Desert Sand Scrub	
G600	Great Basin-Intermountain Ruderal Dry Shrubland & Grassland	may include similar alliances, but is restricted to cool, semi-arid desert regions.

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: The physiognomy of this group includes open to dense shrublands and shrub-steppe with a sparse to dense, annual- or perennial-dominated herbaceous layer.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This broadly defined ruderal group includes all desert scrub with an exotic species-dominated understory (>90% relative cover) in the herbaceous layer as well as exotic-dominated herbaceous stands. These open to dense grasslands and forblands are composed of either exotic annual or biennial grasses or forbs with low cover of perennial species (<10% absolute

cover) or stands with a significant perennial herbaceous layer (>10% absolute cover) strongly dominated by exotics (>90% relative cover) with or without annuals and biennials present to dominant. This group includes upland desert scrub strongly dominated by invasive native species (*Prosopis glandulosa* and *Prosopis velutina*) with >95% relative cover and >10% absolute shrub cover. *Prosopis* spp. that occur naturally (non-ruderal) in desert lowlands, drainages, washes and riparian areas (bosque) are excluded from this ruderal type. Characteristic understory species include *Brassica nigra*, *Brassica tournefortii*, *Bromus madritensis*, *Bromus rubens*, *Cynodon dactylon*, *Eragrostis lehmanniana*, *Erodium cicutarium*, *Panicum antidotale*, *Schismus arabicus*, *Schismus barbatus*, and *Sorghum halepense* with little native composition remaining. Other woody species may include *Calliandra eriophylla*, *Gutierrezia sarothrae*, or *Isocoma tenuisecta*. *Gutierrezia microcephala* is abundant in some stands. Remnant desert grasses include *Aristida ternipes*, *Bouteloua chondrosioides*, *Bouteloua curtipendula*, *Bouteloua eriopoda*, *Bouteloua rothrockii*, *Digitaria californica*, and *Eragrostis intermedia*. Other common herbaceous species include *Allionia incarnata*, *Ambrosia confertiflora*, *Boerhavia erecta*, *Mollugo verticillata*, *Cylindropuntia versicolor* (= *Opuntia versicolor*), *Panicum hirticaule*, *Polygala barbeyana*, *Proboscidea parviflora*, and *PheMERanthus aurantiacus* (= *Talinum aurantiacum*). Other associated species such as *Chenopodium berlandieri*, *Chloris virgata*, *Eragrostis cilianensis*, *Eragrostis pectinacea*, *Eriochloa acuminata*, *Ipomoea* spp., *Kallstroemia grandiflora*, *Leptochloa panicea* ssp. *brachiata* (= *Leptochloa filiformis*), *Salsola kali*, and *Solanum elaeagnifolium* are often present. The ruderal native annual forb *Amaranthus palmeri* often dominates or codominates disturbed stands.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: During the last century, the area occupied by the ruderal upland mesquite-dominated desert thornscrub group has increased through conversion of desert grasslands as a result of drought, overgrazing and *Prosopis glandulosa* seed dispersion by livestock, and/or decreases in fire frequency (Brown and Archer 1987). It is believed that this group formerly occurred in relatively minor amounts and was largely confined to drainages until cattle distributed seed upland from the bosques into desert grasslands (Brown and Archer 1987, 1989). Shrublands dominated by *Prosopis* spp. have replaced large areas of desert grasslands, especially those formerly dominated by *Bouteloua eriopoda*, in Trans-Pecos Texas, southern New Mexico and southeastern Arizona (York and Dick-Peddie 1969, Hennessy et al. 1983). Studies on the Jornada Experimental Range suggest that combinations of drought, overgrazing by livestock, wind and water erosion, seed dispersal by livestock, fire suppression, shifting dunes, and changes in the seasonal distribution of precipitation have caused this recent, dramatic shift in vegetation physiognomy (Buffington and Herbel 1965, Herbel et al. 1972, Humphrey 1974, McLaughlin and Bowers 1982, Gibbens et al. 1983, Hennessy et al. 1983, Schlesinger et al. 1990, McPherson 1995).

For sandy site desert scrub it is important to differentiate between (1) coppice dunes / associated interdune and (2) sandsheets. Invasive mesquite dominates on coppice dunes, especially where the interdune contains an argillic horizon layer with increased clay content. Mesquite produces large taproots and long lateral roots which enable it to extract moisture from deeper depths and the associated interdune. On sandsheets, as noted by Steven Yanoff (pers. comm.), sandsage dominates. These soils are typically deeper and coarser-textured (sand and loamy sand). The coarse texture allows rapid infiltration and helps decrease wicking of soil moisture to the surface via capillary rise. Common associations on sandsheets dominated by *Artemisia filifolia*, *Psoralea scoparius*, and *Rhus microphylla* occurred historically and are not included in this group with invasive *Prosopis glandulosa* unless there is an herbaceous understory that is dominated by exotic species.

ENVIRONMENT

Environmental Description: This ruderal desert scrub group is found in Arizona in areas that were formerly mixed desert grasslands, in northern Mexico, and possibly in New Mexico and Texas. Elevations range from 960-1100 m (3150-3600 feet). Climate is arid to semi-arid with hot summers. Mean annual precipitation ranges from 22-28 cm, but can vary greatly from year to year. Drought is not uncommon. Annual precipitation has bimodal distribution with the proportion of summer precipitation decreasing westward (Barbour and Major 1977). At Tucson, Arizona, about half of the annual rain falls during July to October with the balance during the winter months. The most arid season is late spring and early summer. The summer rain often occurs as high-intensity convective storms. Stands occur on alluvial fans, ridges, hills and valley floors. Sites occur on flats and basins to moderately steep slopes. Substrates are variable and range from well-drained sandy loam to finer-textured silt loam or clays.

DISTRIBUTION

***Geographic Range:** This ruderal desert scrub group occurs in Arizona and possibly New Mexico and Texas in areas that were formerly mixed desert grasslands. It likely occurs in northern Mexico and is presumably widespread in agricultural areas in this warm semi-arid region.

Nations: MX, US

States/Provinces: AZ, CA, CO, MXCH?, MXCO, MXSO?, NM, NV, OK?, TX

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS***Plot Analysis Summary [Med - High Confidence]:*****Plots Used to Define the Type [Med - High Confidence]:****CONFIDENCE LEVEL**

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A3135	<i>Prosopis glandulosa</i> Ruderal Desert Sand Scrub Alliance
A3162	<i>Prosopis glandulosa</i> Ruderal Desert Scrub Alliance
A3163	<i>Prosopis velutina</i> Ruderal Desert Scrub Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note
2015-12-19	G289 <i>Prosopis glandulosa</i> - <i>Prosopis velutina</i> Upland Ruderal Scrub Group	G289 merged into G819

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
=	Shrub - Scrub Disclimax Series - 143.16	Brown et al. 1979	

AUTHORSHIP***Primary Concept Source [if applicable]:** K.A. Schulz, in Faber-Langendoen et al. (2015)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** K.A. Schulz

Acknowledgments [optional]:

Version Date: 06 Nov 2015

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3.B.1.Ne. Western North American Cool Semi-Desert Scrub & Grassland (D040)

M499. Western North American Cool Semi-Desert Ruderal Scrub & Grassland

3. Desert & Semi-Desert

3.B.1.Ne. Western North American Cool Semi-Desert Scrub & Grassland

G600. Great Basin-Intermountain Ruderal Dry Shrubland & Grassland

Type Concept Sentence: This semi-desert interior western U.S. ruderal shrubland and grassland group includes shrubland, shrub-steppe and grassland stands that are strongly dominated (>90% relative canopy cover) by invasive, exotic species. Additionally, this group contains shrubland and shrub-steppe that are dominated or codominated by native shrub species (>10% relative cover) with a significant herbaceous understory (>10% absolute cover) that is strongly dominated (>90% relative canopy cover) by exotic herbaceous species. [For LANDFIRE ReMap, this Group has been split into 4 EVT's: Great Basin & Intermountain Introduced Annual and Biennial Forbland; Great Basin & Intermountain Introduced Annual Grassland; Great Basin & Intermountain Introduced Perennial Grassland and Forbland; and Great Basin & Intermountain Ruderal Shrubland.](#)

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 3.B.1.Ne.90. Western North American Cool Semi-Desert Ruderal Scrub & Grassland (M499)

Elcode: G600

***Scientific Name:** Great Basin-Intermountain Ruderal Dry Shrubland & Grassland Group

***Common (Translated Scientific) Name:** Great Basin-Intermountain Ruderal Dry Shrubland & Grassland Group

***Colloquial Name:** Great Basin-Intermountain Ruderal Dry Shrubland & Grassland

***Type Concept:** This semi-desert interior western U.S. ruderal shrubland and grassland group includes shrubland, shrub-steppe and grassland stands that are strongly dominated (>90% relative canopy cover) by invasive, exotic species. Diagnostic invasive shrubs include *Alhagi maurorum*, *Cytisus striatus*, *Zygophyllum fabago*, or other exotic shrubs. Herbaceous stands include open to dense grasslands and forblands composed of either exotic annual or biennial grasses or forbs with low cover of perennial species (<10% absolute cover) or stands with a significant perennial herbaceous layer (>10% absolute cover) strongly dominated by exotics (>90% relative cover) with or without annuals and biennials present to dominant. There are relatively few cool, semi-arid invasive perennial graminoids such as *Agropyron cristatum*. Relatively mesic, invasive perennial hay grasses such as *Bromus inermis*, *Dactylis glomerata*, and *Phleum pratense* are typically absent or have low cover and are restricted to mesic microsites as they are more common in higher elevation or higher latitude, temperate climates or relatively mesic sites. Numerous exotic perennial herbaceous species may compose these stands, such as *Acroptilon repens*, *Cardaria draba*, *Centaurea calcitrapa*, *Centaurea diffusa*, *Centaurea iberica*, *Centaurea stoebe ssp. micranthos*, *Centaurea virgata*, *Euphorbia esula*, *Hypericum perforatum*, *Lepidium latifolium*, *Peganum harmala*, or a mixture of other exotic forbs and graminoids. Stands dominated by annuals may be composed of annual grasses such as *Bromus arvensis* (= *Bromus japonicus*), *Bromus hordeaceus*, *Bromus madritensis*, *Bromus tectorum*, *Taeniatherum caput-medusae*, or annual forbs, including *Bassia scoparia* (= *Kochia scoparia*), *Brassica nigra*, *Centaurea melitensis*, *Centaurea solstitialis*, *Crupina vulgaris*, *Cynoglossum officinale*, *Descurainia sophia*, *Erodium cicutarium*, *Hyoscyamus niger*, *Isatis tinctoria*, *Salsola tragus*, *Sisymbrium altissimum*, *Taraxacum officinale*, or a mixture of other exotic annual forbs and grasses. Additionally, this group contains

semi-desert shrublands and shrub-steppe that are dominated or codominated by native shrub species such as *Artemisia tridentata* with a significant herbaceous understory (>10% absolute cover) that is strongly dominated (>90% relative canopy cover) by exotic herbaceous species such as *Agropyron cristatum* or *Bromus tectorum*. Stands occur in disturbed dry to mesic basins, alluvial fans, and foothills elevations up to 2200 m and are restricted to areas with the cool, semi-arid climate found in the intermountain western U.S. region. Stands can be large areas or narrow strips adjacent to roadsides or under powerlines and other disturbed areas. Soils are mostly mineral and well-drained. Due to disturbance, soils may be compacted. It is an early-successional type that may occur in areas disturbed by fire, grazing or mining. This group may grade into wetter areas and may have transition zones where mesic forbs intermix with wetter forbs and graminoids found in ~Western North American Ruderal Marsh, Wet Meadow & Shrubland Group (G524)\$. This group does not include the mesic introduced hay grasses such as *Bromus inermis*, *Dactylis glomerata*, and *Phleum pratense* that have escaped from improved pasture and irrigated meadow to invade montane grasslands. These grasslands are classified in the more temperate ~Western North American Interior Ruderal Grassland & Shrubland Group (G624)\$.

***Diagnostic Characteristics:** This ruderal shrubland and grassland group occurs in the semi-arid interior western U.S. and includes shrubland, shrub-steppe and grassland stands that are strongly dominated (>90% relative canopy cover) by invasive, exotic species. Additionally, this group contains shrubland and shrub-steppe that is dominated or codominated by native shrub species (>10% relative cover) with a significant herbaceous understory (>10% absolute cover) that is strongly dominated (>90% relative canopy cover) by exotic herbaceous species.

***Classification Comments:** This group may be difficult to determine from native degraded shrublands and grasslands when non-native species codominate. The test is that the non-native species, especially invasive species, far outweigh (>90% relative cover) native species in abundance and richness, such that a well-trained observer cannot tell what the native counterpart may have been or to do so is only speculation. Dominant and diagnostic semi-arid exotic species *Agropyron cristatum* can be present to codominant in ~Western North American Interior Ruderal Grassland & Shrubland Group (G624)\$ when codominated by relatively mesic species such as *Bromus inermis* or exotic forage grasses such as *Agrostis stolonifera*, *Dactylis glomerata*, *Phleum pratense*, and *Poa pratensis* that are characteristic of more temperate climates.

This group may grade into wetter areas and may have transition zones where mesic forbs intermix with wetter forbs and graminoids found in ~Western North American Ruderal Marsh, Wet Meadow & Shrubland Group (G524)\$. This group does not include the mesic introduced hay grasses such as *Bromus inermis*, *Dactylis glomerata*, and *Phleum pratense* that have escaped from improved pasture and irrigated meadow to invade montane grasslands. These grasslands are classified in the more temperate ~Western North American Interior Ruderal Grassland & Shrubland Group (G624)\$.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G648	Southern Vancouverian Lowland Ruderal Grassland & Shrubland	may include similar alliances, but is restricted to lowlands west of the Cascade Range.
G624	Western North American Interior Ruderal Grassland & Shrubland	has similar ruderal alliances but rather than occurring in cool, semi-arid sites, stands occur in cool, temperate regions and include montane, subalpine and alpine areas. Vegetation lacks obligate wetland species and is not dominated by facultative wetland species.
G524	Western North American Ruderal Marsh, Wet Meadow & Shrubland	has similar ruderal alliances but occurs on mesic to wet sites and vegetation either includes obligate wetland species or is dominated by facultative wetland species.
G819	North American Warm Desert Ruderal Scrub	
G677	North American Warm Desert Ruderal Grassland	may include similar alliances, but is restricted warm, semi-arid desert regions.

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: This group includes shrubland and shrub-steppe stands that have an open to dense shrub canopy, and annual and perennial grasslands and forblands with an open to dense herbaceous layer.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: This ruderal shrubland and grassland group includes shrubland and shrub-steppe stands that have an open to dense shrub canopy (>10% absolute cover) that is strongly dominated (>90% relative canopy cover) by invasive, introduced shrub species such as *Alhagi maurorum*, *Cytisus striatus*, *Zygophyllum fabago*, or other exotic shrubs. Additionally, this group includes shrubland and shrub-steppe that is dominated or codominated by native shrub species (>10% relative cover) with a significant herbaceous understory (>10% absolute cover) that is strongly dominated (>90% relative canopy cover) by exotic herbaceous species. Herbaceous layers are composed of either exotic annuals with low cover of perennial species, or high cover of exotic perennials. Also included in this group are open to dense ruderal herbaceous stands without a shrub layer (<10% absolute cover). The herbaceous understory (>10% absolute cover) is strongly dominated (>90% relative canopy cover) by exotic herbaceous species. Herbaceous layers are composed of either exotic annuals with low cover of perennial species (<5% absolute cover), or moderate perennial cover (>10% absolute cover) dominated by of exotic perennials, either graminoids or forbs or a combination. There are relatively few cool, semi-arid perennial graminoids such as *Agropyron cristatum* (which has frequently been purposefully seeded to prevent soil erosion or provide livestock forage). The relatively mesic, invasive perennial hay grasses such as *Bromus inermis*, *Dactylis glomerata*, and *Phleum pratense* are typically absent or have low cover and are restricted to mesic microsites as they are more common in higher elevation or higher latitude, temperate climates or relatively mesic sites. Numerous exotic perennial herbaceous species may compose these stands such as *Acroptilon repens*, *Cardaria draba*, *Centaurea calcitrapa*, *Centaurea diffusa*, *Centaurea iberica*, *Centaurea stoebe ssp. micranthos*, *Centaurea virgata*, *Hypericum perforatum*, *Lepidium latifolium*, *Peganum harmala*, or a mixture of other exotic forbs and graminoids. Stands dominated by annuals may be composed of annual grasses such as *Bromus arvensis* (= *Bromus japonicus*), *Bromus hordeaceus*, *Bromus madritensis*, *Bromus tectorum*, *Taeniatherum caput-medusae*, or annual forbs, including *Bassia scoparia* (= *Kochia scoparia*), *Brassica nigra*, *Centaurea melitensis*, *Centaurea solstitialis*, *Crupina vulgaris*, *Cynoglossum officinale*, *Descurainia sophia*, *Erodium cicutarium*, *Hyoscyamus niger*, *Isatis tinctoria*, *Lepidium perfoliatum*, *Salsola tragus*, *Sisymbrium altissimum*, *Taraxacum officinale*, or a mixture of other exotic annual forbs and grasses.

*Floristics Table [Med - High Confidence]:

*Number of Plots:

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: Most of the invasive diagnostic species are cool-season (C3) plants such as *Agropyron cristatum* and *Bromus tectorum*. Cheatgrass expansion has radically changed fire regimes and vegetation over large areas in the Intermountain West. Cheatgrass invades native vegetation such as big sagebrush shrubland, then produces large amounts of fine fuels that readily carry fire, increasing the number, size and frequency of burns (fire-return interval = 3-5 year) which reduces cover of perennial vegetation and favors dominance by annual grasses (Young and Evans 1978, Zouhar 2003). Crested wheatgrass burns quickly and is therefore less susceptible to damage by fire than some native bunchgrass species that have a thick cespitose growth form. The fire may stay longer in the culms, resulting in heat transfer to the ground and the death of the plant (DePuit 1986). In crested wheatgrass, there is usually little heat transfer into the soil, so the tillers and root system are usually undamaged (DePuit 1986). Thus the more frequent fire regime caused by the introduction of *Bromus tectorum* also favors the maintenance of *Agropyron cristatum* over the establishment or survival of native bunchgrasses (S. Rust pers. comm. 2014).

ENVIRONMENT

Environmental Description: This interior western U.S. ruderal shrubland and grassland group is found on disturbed dry to mesic, basins, alluvial fans, and foothills elevations (up to 2200 m). Stands can be large areas or narrow strips adjacent to roadsides or under powerlines, in waste places such as abandoned agricultural fields that are no longer irrigated, oil and gas development areas, and other disturbed areas. *Climate:* This group occurs in the cool, semi-arid, continental, climate found intermountain western U.S. region. *Soil/substrate/hydrology:* Soils are mostly mineral and well-drained. Due to disturbance, soils may be compacted. It is an early-successional type that may occur in areas disturbed by fire, grazing or mining. However, it also occurs over vast acres of heavily overgrazed lands in the arid west, where livestock such as cows and horses have broken soil biotic crust, compacted soil and reduced native plant vigor.

DISTRIBUTION

***Geographic Range:** This ruderal group contains disturbed semi-arid grasslands, meadows, shrublands and shrub-steppe found in the interior western U.S. on disturbed dry to mesic, basins, alluvial fans, and foothills elevations (up to 2200 m). Stands do not extend up into the cool, temperate zone in included mountain ranges. This group does not extend south to the warm deserts or east into the Great Plains or west into cismontane California or the west side of the Cascades.

Nations: CA, US

States/Provinces: AZ, CA, CO, ID, MT, ND, NV, OR, SD, SK, UT, WY

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4213	<i>Artemisia</i> spp. - Mixed Shrub Ruderal Understory Shrubland Alliance
A3257	<i>Centaurea solstitialis</i> - <i>Isatis tinctoria</i> - <i>Salsola tragus</i> Ruderal Annual Forb Alliance
A3253	<i>Alhagi maurorum</i> - <i>Zygophyllum fabago</i> Ruderal Shrubland Alliance
A1814	<i>Bromus tectorum</i> - <i>Taeniatherum caput-medusae</i> Ruderal Annual Grassland Alliance
A3255	<i>Cardaria draba</i> - <i>Centaurea</i> spp. - <i>Lepidium latifolium</i> Ruderal Perennial Forb Alliance
A4148	<i>Agropyron cristatum</i> Western Ruderal Perennial Grassland Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

***Primary Concept Source [if applicable]:** Faber-Langendoen et al. (2015)

Relationship to NVC	Name Used in Source	Short Citation	Note

***Author of Description:** G. Kittel and K.A. Schulz

Acknowledgments [optional]:

Version Date: 16 Apr 2015

REFERENCES

***References [Required if used in text]:**

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5.B.1.Ed. Neotropical Freshwater Aquatic Vegetation (D097)

M892. Neotropical Ruderal Freshwater Aquatic Vegetation

5. Aquatic Vegetation

5.B.1.Ed. Neotropical Freshwater Aquatic Vegetation

G816. Neotropical Ruderal Freshwater Aquatic Vegetation

Type Concept Sentence:

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 5.B.1.Ed.2. Neotropical Ruderal Freshwater Aquatic Vegetation (M892)

Elcode: G816

*Scientific Name: Neotropical Ruderal Freshwater Aquatic Vegetation Group

*Common (Translated Scientific) Name: Neotropical Ruderal Freshwater Aquatic Vegetation Group

*Colloquial Name: Neotropical Ruderal Freshwater Aquatic Vegetation

*Type Concept:

*Diagnostic Characteristics:

*Classification Comments:

*Similar NVC Types [if applicable]:

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

*Floristics Table [Med - High Confidence]:

*Number of Plots:

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:**ENVIRONMENT****Environmental Description:****DISTRIBUTION*****Geographic Range:****Nations:** CU, JM, MX, PR, US, XE**States/Provinces:** FL**USFS Ecoregions (2007) [optional]:****Omernik Ecoregions L3, L4 [optional]:****MLRAs [optional]:****PLOT SAMPLING AND ANALYSIS*****Plot Analysis Summary [Med - High Confidence]:*****Plots Used to Define the Type [Med - High Confidence]:****CONFIDENCE LEVEL****USNVC Confidence Level:** Moderate**USNVC Confidence Comments [optional]:****HIERARCHY*****Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A1727	<i>Pistia stratiotes</i> Ruderal Aquatic Bed Alliance

DISCUSSION**Discussion [optional]:****CONCEPT HISTORY*****Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS**Supporting Concepts [optional]:**

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP***Primary Concept Source [if applicable]:**

Relationship to NVC	Name Used in Source	Short Citation	Note

Author of Description:*Acknowledgments [optional]:****REFERENCES*****References [Required if used in text]:**

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

5.B.1.Ob. Polynesian-Eastern Melanesian Freshwater Aquatic Vegetation (D084)

M261. Polynesian-Eastern Melanesian Ruderal Freshwater Aquatic Vegetation

5. Aquatic Vegetation

5.B.1.Ob. Polynesian-Eastern Melanesian Freshwater Aquatic Vegetation

G438. Polynesian-Eastern Melanesian Ruderal Freshwater Aquatic Vegetation

Type Concept Sentence:

OVERVIEW

*Hierarchy Level: Group

*Placement in Hierarchy: 5.B.1.Ob.90. Polynesian-Eastern Melanesian Ruderal Freshwater Aquatic Vegetation (M261)

Elcode: G438

*Scientific Name: Polynesian-Eastern Melanesian Ruderal Freshwater Aquatic Vegetation Group

*Common (Translated Scientific) Name: Polynesian-Eastern Melanesian Ruderal Freshwater Aquatic Vegetation Group

*Colloquial Name: Polynesian-Eastern Melanesian Ruderal Freshwater Aquatic Vegetation

*Type Concept:

*Diagnostic Characteristics:

*Classification Comments:

*Similar NVC Types [if applicable]:

Elcode	Scientific or Colloquial Name	Note

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary:

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary:

*Floristics Table [Med - High Confidence]:

*Number of Plots:

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics:

ENVIRONMENT

Environmental Description:

DISTRIBUTION

*Geographic Range:

Nations:

States/Provinces:

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

*Plot Analysis Summary [Med - High Confidence]:

*Plots Used to Define the Type [Med - High Confidence]:

CONFIDENCE LEVEL

USNVC Confidence Level:

USNVC Confidence Comments [optional]:

HIERARCHY

*Lower Level NVC Types:

Elcode	Scientific or Colloquial Name

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

*Recent Concept Lineage [if applicable]:

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note

AUTHORSHIP

*Primary Concept Source [if applicable]: Faber-Langendoen et al.

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description:

Acknowledgments [optional]:

REFERENCES

*References [Required if used in text]:

Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]

5.B.2.Na. North American Freshwater Aquatic Vegetation (D049)

M401. North American Temperate Ruderal Aquatic Vegetation

5. Aquatic Vegetation

5.B.2.Na. North American Freshwater Aquatic Vegetation

G595. Eastern North American Ruderal Aquatic Vegetation

Type Concept Sentence: This ruderal aquatic group occurs in temperate and tropical North America where wetlands are strongly dominated by exotic species, typically *Alternanthera philoxeroides*, *Eichhornia crassipes*, *Ludwigia peploides*, *Pistia stratiotes*, and *Salvinia molesta* in warm-temperate regions and *Myriophyllum spicatum*, *Hydrocharis morsus-ranae*, and *Trapa natans* in cool-temperate regions.

OVERVIEW

***Hierarchy Level:** Group

***Placement in Hierarchy:** 5.B.2.Na.90. North American Temperate Ruderal Aquatic Vegetation (M401)

Elcode: G595

***Scientific Name:** *Eichhornia crassipes* - *Alternanthera philoxeroides* - *Trapa natans* Ruderal Freshwater Aquatic Vegetation Group

***Common (Translated Scientific) Name:** Common Water-hyacinth - Alligator-weed - Water Chestnut Ruderal Freshwater Aquatic Vegetation Group

***Colloquial Name:** Eastern North American Ruderal Aquatic Vegetation

***Type Concept:** This ruderal aquatic vegetation occurs in freshwater wetlands of lakes, rivers, and ponds, in areas which are permanently or semipermanently flooded. The dominant growth forms are floating, rooting and submersed aquatic vegetation. The most common species include the exotics *Alternanthera philoxeroides*, *Eichhornia crassipes*, *Ludwigia peploides*, *Pistia stratiotes*, and *Salvinia molesta* in warm-temperate regions. In cool-temperate regions, *Myriophyllum spicatum*, *Hydrocharis morsus-ranae*, and *Trapa natans* are locally common. These exotic species can spread vigorously and form extensive mats that cover the surface or submersed areas of the water.

***Diagnostic Characteristics:** Floating aquatic vegetation dominated by ruderal species such as *Alternanthera philoxeroides*, *Eichhornia crassipes*, *Hydrilla verticillata*, *Ludwigia peploides*, *Myriophyllum spicatum*, and *Pistia stratiotes*. Other species that could be included are *Salvinia molesta* or *Trapa natans* (in cool-temperate areas). Native rooted floating-leaved and submergent species have little cover, generally less than 20-25%.

***Classification Comments:** *Trapa natans* occurs in cool-temperate areas (i.e., New England), rather than the warm-temperate and tropical areas where some of the other species occur. This eastern North American group could be split into cool-temperate ruderal aquatic vegetation separate from warm-temperate and tropical. Or perhaps there is a North American-wide warm-temperate versus cool-temperate group. *Myriophyllum spicatum* occurs in over 40 U.S. states and several provinces of Canada, which may indicate that one North American group is warranted, rather than eastern and western ones or warm-temperate and cool-temperate groups. Perhaps these divisions are more appropriate at the NVC Alliance level.

***Similar NVC Types [if applicable]:**

Elcode	Scientific or Colloquial Name	Note
G325	Great Plains Freshwater Marsh	
G125	Eastern North American Freshwater Marsh	
G110	Atlantic & Gulf Coastal Fresh-Oligohaline Tidal Marsh	
G114	Eastern North American Freshwater Aquatic Vegetation	
G544	Western North American Temperate Freshwater Aquatic Vegetation	

Similar NVC Types General Comments [optional]:

VEGETATION

Physiognomy and Structure Summary: Floating-leaved or submersed herbaceous aquatic plants dominate. They can have sparse to dense cover.

Physiognomy and Structure Table [optional]:

Physiognomy-Structure Category	Prevailing Height (m)	Height Range (opt.)	Mean % Cover	Cover Range (opt.)

Floristics Summary: In the warm-temperate region, *Alternanthera philoxeroides*, *Eichhornia crassipes*, *Ludwigia peploides*, and *Pistia stratiotes* are the typical aquatic exotic species. Other species include *Egeria densa*, *Hydrilla verticillata*, *Myriophyllum aquaticum*, *Myriophyllum spicatum*, *Najas minor*, *Nymphoides peltata*, *Nymphoides cristata*, *Potamogeton crispus*, *Salvinia minima*, *Salvinia natans*, and *Salvinia molesta*. In the cool-temperate region, *Myriophyllum spicatum*, *Hydrocharis morsus-ranae*, and *Trapa natans*

are locally common exotic invasive plants.

***Floristics Table [Med - High Confidence]:**

***Number of Plots:**

Physiognomy-Structure Category	Taxon Name	Specific Growth Form (opt.)	Constancy	Mean % Cover	Cover Range (opt.)	Diagnostic

Dynamics: In the warm-temperate region, cold temperatures can cause damage to most of these plants, and probably limits their ranges to the north. After flooding events, these plants can establish in new areas where the floodwater has carried them. Many of these plants can also be spread to new areas on the prows of boats. Various control methods have been used to reduce nuisance infestations (Gettys et al. 2009).

ENVIRONMENT

Environmental Description: *Climate:* This aquatic vegetation occurs in both warm-temperate and tropical areas, which have a humid climate, and in cool-temperate regions. *Soil/substrate/hydrology:* This aquatic vegetation occurs in freshwater wetlands that are permanently or semipermanently flooded. Areas may be impounded, natural lakes, or low-gradient flowing streams and rivers. Often patches of this vegetation will occur in the more slowly flowing sections of rivers and streams.

DISTRIBUTION

***Geographic Range:** This group is found in eastern Canada, the eastern, midwestern and southeastern United States, and eastern Mexico.

Nations: CA, MX, US

States/Provinces: AL, AR, CT, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MI, MN, MO, MS, ND, NE, NH, NJ, NY, OH, OK, ON, PA, QC, SC, TN, TX, VA, VT, WI, WV

USFS Ecoregions (2007) [optional]:

Omernik Ecoregions L3, L4 [optional]:

MLRAs [optional]:

PLOT SAMPLING AND ANALYSIS

***Plot Analysis Summary [Med - High Confidence]:**

***Plots Used to Define the Type [Med - High Confidence]:**

CONFIDENCE LEVEL

USNVC Confidence Level: Moderate

USNVC Confidence Comments [optional]:

HIERARCHY

***Lower Level NVC Types:**

Elcode	Scientific or Colloquial Name
A4219	<i>Eichhornia crassipes</i> - <i>Alternanthera philoxeroides</i> Ruderal Aquatic Vegetation Alliance
A4222	<i>Trapa natans</i> - <i>Hydrocharis morsus-ranae</i> Ruderal Aquatic Vegetation Alliance
A1745	<i>Hydrilla verticillata</i> - <i>Myriophyllum spicatum</i> Ruderal Aquatic Vegetation Alliance

DISCUSSION

Discussion [optional]:

CONCEPT HISTORY

***Recent Concept Lineage [if applicable]:**

Date	Predecessor	Note

RELATED CONCEPTS

Supporting Concepts [optional]:

Relationship to NVC	Supporting Concept Name	Short Citation	Note
>	Aquatic Bed, Permanently Flooded and Semipermanently Flooded	Cowardin et al. 1979	
>	Freshwater marsh	Kushlan 1990	

Relationship to NVC	Supporting Concept Name	Short Citation	Note
<	Floating mats of water hyacinth	Kushlan 1990	

AUTHORSHIP

*Primary Concept Source [if applicable]: T.L. Morris (1974)

Relationship to NVC	Name Used in Source	Short Citation	Note

*Author of Description: C. Nordman and J. Drake

Acknowledgments [optional]:

Version Date: 07 May 2015

REFERENCES

*References [Required if used in text]:

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- Faber-Langendoen, D., J. Drake, S. Gawler, M. Hall, C. Josse, G. Kittel, S. Menard, C. Nordman, M. Pyne, M. Reid, L. Sneddon, K. Schulz, J. Teague, M. Russo, K. Snow, and P. Comer, editors. 2010-2017a. Divisions, Macrogroups and Groups for the Revised U.S. National Vegetation Classification. NatureServe, Arlington, VA. plus appendices. [in preparation]
- Gettys, L. A., W. T. Haller, and M. Bellaud, editors. 2009. Biology and control of aquatic plants: A best management practices handbook. Aquatic Ecosystem Restoration Foundation, Marietta GA. 210 pp. [http://plants.ifas.ufl.edu/misc/pdfs/AERF_handbook.pdf]
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- Morris, T. L. 1974. Water hyacinth *Eichhornia crassipes* (Mart.) Solms: Its ability to invade aquatic ecosystems of Paynes Prairie Preserve. M.S. thesis, University of Florida, Gainesville.