Family: *Myricaceae*

Taxon: *Morella cerifera*

Synonym: *Myrica cerifera L. (basionym)*

Common Name wax-myrtle
bayberry
candleberry

Questionaire : current 20090513 **Assessor:** Chuck Chimera **Designation:** H(Hawai'i)

Status: Assessor Approved **Data Entry Person:** Chuck Chimera **WRA Score** 20

101	**Is the species highly domesticated?**	**y=-3, n=0**	**n**
102	**Has the species become naturalized where grown?**	**y=1, n=-1**	
103	**Does the species have weedy races?**	**y=1, n=-1**	
201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**(0-low; 1-intermediate; 2-high) (See Appendix 2)**	**High**
202	**Quality of climate match data**	**(0-low; 1-intermediate; 2-high) (See Appendix 2)**	**High**
203	**Broad climate suitability (environmental versatility)**	**y=1, n=0**	**n**
204	**Native or naturalized in regions with tropical or subtropical climates**	**y=1, n=0**	**y**
205	**Does the species have a history of repeated introductions outside its natural range?**	**y=-2, ?=-1, n=0**	**n**
301	**Naturalized beyond native range**	**y = 1*multiplier (see Appendix 2), n= question 205**	**y**
302	**Garden/amenity/disturbance weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**n**
303	**Agricultural/forestry/horticultural weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**y**
304	**Environmental weed**	**n=0, y = 2*multiplier (see Appendix 2)**	**y**
305	**Congeneric weed**	**n=0, y = 1*multiplier (see Appendix 2)**	**y**
401	**Produces spines, thorns or burrs**	**y=1, n=0**	**n**
402	**Allelopathic**	**y=1, n=0**	**y**
403	**Parasitic**	**y=1, n=0**	**n**
404	**Unpalatable to grazing animals**	**y=1, n=-1**	**n**
405	**Toxic to animals**	**y=1, n=0**	**n**
406	**Host for recognized pests and pathogens**	**y=1, n=0**	**n**
407	**Causes allergies or is otherwise toxic to humans**	**y=1, n=0**	**n**
408	**Creates a fire hazard in natural ecosystems**	**y=1, n=0**	**y**
409	**Is a shade tolerant plant at some stage of its life cycle**	**y=1, n=0**	**y**
410	**Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)**	**y=1, n=0**	**y**

411	**Climbing or smothering growth habit**	**y=1, n=0**	**n**
412	**Forms dense thickets**	**y=1, n=0**	**y**
501	**Aquatic**	**y=5, n=0**	**n**
502	**Grass**	**y=1, n=0**	**n**
503	**Nitrogen fixing woody plant**	**y=1, n=0**	**y**
504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**y=1, n=0**	**n**
601	**Evidence of substantial reproductive failure in native habitat**	**y=1, n=0**	**n**
602	**Produces viable seed**	**y=1, n=-1**	**y**
603	**Hybridizes naturally**	**y=1, n=-1**	**y**
604	**Self-compatible or apomictic**	**y=1, n=-1**	**n**
605	**Requires specialist pollinators**	**y=-1, n=0**	**n**
606	**Reproduction by vegetative fragmentation**	**y=1, n=-1**	**y**
607	**Minimum generative time (years)**	**1 year = 1, 2 or 3 years = 0, 4+ years = -1**	**3**
701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**y=1, n=-1**	**n**
702	**Propagules dispersed intentionally by people**	**y=1, n=-1**	**y**
703	**Propagules likely to disperse as a produce contaminant**	**y=1, n=-1**	**n**
704	**Propagules adapted to wind dispersal**	**y=1, n=-1**	**n**
705	**Propagules water dispersed**	**y=1, n=-1**	
706	**Propagules bird dispersed**	**y=1, n=-1**	**y**
707	**Propagules dispersed by other animals (externally)**	**y=1, n=-1**	**n**
708	**Propagules survive passage through the gut**	**y=1, n=-1**	**y**
801	**Prolific seed production (>1000/m2)**	**y=1, n=-1**	
802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**y=1, n=-1**	
803	**Well controlled by herbicides**	**y=-1, n=1**	**y**
804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y=1, n=-1**	**y**
805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	**y=-1, n=1**	**n**

Designation: H(Hawai'i) **WRA Score** **20**

Supporting Data:

101	2007. Van Dersal, W.. Native Woody Plants of the United States. Read Country Books, Alcester, UK	Morella cerifera is not highly domesticated
201	2000. Liogier, A. H./ Martorell, L. F.. Flora of Puerto Rico and adjacent islands: a systematic synopsis. La Editorial, UPR, San Juan, Puerto Rico	On hillsides and in thickets, in moist districts, at lower to middle elevations, Puerto Rico; southeastern North America, Bermuda, Bahamas, Greater Antilles, Guadeloupe, Mexico and Central America.
201	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	M. cerifera is native to coastal regions of the southeastern United States,
202	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	M. cerifera is native to coastal regions of the southeastern United States,
203	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Wax-myrtle is common in a variety of habitats and plant communities in the southeastern United States. It grows equally well with the subtropical vegetation of south Florida and the temperate vegetation of the Inland Coastal Plain...Wax-myrtle grows on a variety of sites but seems to be restricted to climates with mild winters and long, hot, humid summers, and elevations below 500 feet (150 m).
203	2006. Burrell, C. C./Marinelli, J./Harper-Lore, B.. Native alternatives to invasive plants. Brooklyn Botanic Garden, Brooklyn, NY	Hardiness Range: Zones 7 to 10
204	2000. Liogier, A. H./ Martorell, L. F.. Flora of Puerto Rico and adjacent islands: a systematic synopsis. La Editorial, UPR, San Juan, Puerto Rico	On hillsides and in thickets, in moist districts, at lower to middle elevations, Puerto Rico; southeastern North America, Bermuda, Bahamas, Greater Antilles, Guadeloupe, Mexico and Central America.
204	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Naturalized populations of M. cerifera have been confirmed on the islands of Maui and Hawai‘i, however its status on Oahu and other islands is unknown.
205	2000. Liogier, A. H./ Martorell, L. F.. Flora of Puerto Rico and adjacent islands: a systematic synopsis. La Editorial, UPR, San Juan, Puerto Rico	Broad native range [no evidence of repeated introduction outside native range]
301	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Naturalized populations of M. cerifera have been confirmed on the islands of Maui and Hawai‘i, however its status on Oahu and other islands is unknown...Recently, several events have brought the relatively benign nature of M. cerifera into question. In 1994, Maui Pinapple Company staff discovered a naturalized population in the Pu’u Kukui watershed on Maui (Meidell et al.1997; H. Oppenheimer, personal communication). More recently, the construction of a new road across a young, lowland lava flow on the island of Hawai‘i revealed a second large, naturalized population. The location of this colonization is of particular concern. The road follows an 1881 lava flow, the youngest Mauna Loa lava flow in the windward lowlands near Hilo, Hawai‘i.
302	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Wax-myrtle is an early successional species. It is one of the first woody plants to invade secondary dunes and beach meadows in the Southeast [9], and naturally reseeds disturbed sites from adjacent forests [31]. In the Everglades, increased human-caused disturbance, such as draining and burning, has caused wax myrtle to become more common as it invades sawgrass, marl prairie, and mixed hardwood swamp communities. Dense thickets form, known locally as "hell nests" [18,29,47]. [a disturbance weed with negative effects on forestry and natural environment]
303	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Wax-myrtle is an understory pest on southern pine plantations. It competes with pine seedlings and contribute to an accumulation of understory fuels which increases the potential for damaging wildfires [27,28]. Pearson and others [36] believe that the presence of southern bayberry on grazed longleaf pine plantations may have eased grazing pressure on the pine seedlings.

303	1993. Kalmbacher, R. S./Eger, Jr., J. E./Rowland-Bamford, A. J.. Response of Southern Wax Myrtle (Myrica cerifera) to Herbicides in Florida. Weed Technology. 17: 84-91.	An estimated 800 000 ha of pasture in south Florida were infested with wax myrtle (10). Seed dispersal by birds is a major method for spread of this species (2). It is the main food of tree swallows (Iridoprocne bicolor) when these birds winter in Florida and the Gulf area (3). Wax myrtle has become the major woody weed on Florida pasture. Southern wax myrtle can be a dominant shrub that reduced the yield of forage, which makes it a problem on range and pasture.
304	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Abstract Invasive plants that fix nitrogen can alter nutrient availability and thereby community dynamics and successional trajectories of native communities they colonize. Morella cerifera (Myricaceae) is a symbiotic nitrogen fixer originally from the southeastern U.S. that is colonizing native-dominated vegetation on a young lava flow near Hilo, Island of Hawai'i, where it increases total and biologically available soil nitrogen and increases foliar nitrogen concentrations in associated individuals of the native tree Metrosideros polymorpha. This invasion has the potential to alter the few remaining native-dominated lowland forest ecosystems in windward Hawai'i.
305	1989. Vitousek, P. M./Walker, L. R.. Biological Invasion by Myrica Faya in Hawai'i: Plant Demography, Nitrogen Fixation, Ecosystem Effects. Ecological Monographs. 59: 247-265.	Myrica faya, an introduced actinorhizal nitrogen fixer, is invading young volcanic sites in Hawaii Volcanoes National Park. We examined the population biology of the invader and ecosystem-level consequences of its invasion in open-canopied forests resulting from volcanic cinder-fall. Although Myrica faya is nominally dioecious, both males and females produce large amounts of fruit that are utilized by a number of exotic and native birds, particularly the exotic Zosterops japonica. In areas of active colonization, Myrica seed rain under perch trees of the dominant native Metrosideros polymorpha ranged from 6 to 60 seeds/m2/yr; no seeds were captured in the open. Planted seeds of Myrica also germinated and established better under isolated individuals of Metrosideros than in the open. Diameter growth of Myrica is >15-fold greater than that of Metrosideros, and the Myrica population is increasing rapidly. Rates of nitrogen fixation were measured using the acetylene reduction assay calibrated with 15N. Myrica nodules reduced acetylene at between 5 and 20 µmol/g/h, a rate that extrapolated to nitrogen fixation of 18 kg/ha/yr in a densely colonized site. By comparison, all native sources of nitrogen fixation summed to 0.2 kg/ha/yr, and precipitation added <4 kg/ha/yr. Measurements of litter decomposition and nitrogen release, soil nitrogen mineralization, and plant growth in bioassays all demonstrated that nitrogen fixed by Myrica becomes available to other organisms as well. We concluded that biological invasion by Myrica faya alters ecosystem-level properties in this young volcanic area; at least in this case, the demography and physiology of one species controls characteristics of a whole ecosystem. [Myrica faya now Morella faya]
401	2007. Van Dersal, W.. Native Woody Plants of the United States. Read Country Books, Alcester, UK	No spines, thorns or burrs
402	1995. Tolliver, K.S./Colley, D.M./Young, D.R.. Effects of Myrica cerifera on Pinus taeda. American Midland Naturalist. 133: 256-263.	ABSTRACT.-Pinus taeda naturally invades Myrica cerifera thickets as the shrub community succeeds to a maritime forest on southeastern USA barrier islands. Potential mechanisms supporting the persistence of M. cerifera thickets on barrier islands were examined in an environmental chamber. The inhibitory effects of allelochemicals from M. cerifera leaf litter and the soil in which it grows, and the interaction between allelochemicals and light intensity were quantified for seed germination and seedling growth of P taeda. Germination of P taeda seeds was significantly reduced by treatment with leachate from dead M. cerifera leaves, but light level had no significant effect. In contrast, root, shoot and total seedling growth were significantly lower under low light (44 Rmol m-2 sec-1). Root growth under high light (300 Rmol m-2 sec-1) was significantly lower for P taeda seedlings grown in soil collected from beneath Myrica thickets. Both root and shoot growth of P taeda in Myrica soil were significantly higher in the presence of Myrica leaf litter in high light. Thus, litter accumulation may assist P taeda in invading Myrica thicket gaps, possibly by counteracting allelopathic effects of Myrica root exudate. Low light levels and allelopathic effects may interact and contribute to the persistence of Myrica thickets limiting root growth of invading P taeda seedlings, thereby reducing competition for space, soil moisture and nutrients.
403	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Not parasitic

404	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	A consistent contributor to the available browse biomass in southeastern forests, wax-myrtle is occasionally eaten by cattle...Wax-myrtle is unpalatable to white-tailed deer in eastern Texas [24,25]. Its palatability to cattle is unreported.
404	2000. Haywood, J.D./Pearson, H.A./Grelen, H.E./Popham, T.W.. Effects of Date and Frequency of Burning on Southern Bayberry (Myrica cerifera) in Central Louisiana. Texas Journal of Science. 52: 33-42.	Although its abundant seeds are eaten by many songbirds, wild turkey and tree swallows, Myrica cerifera is considered an inferior food plant for white-tailed deer and a secondary food plant for bobwhite quail (Grelen & Duvall 1966; Landers & Johnson 1976; Halls 1977). Consequently, the negative qualities of Myrica cerifera outweigh its benefits for many, and land managers generally wish to control the spread of this shrub. [inferior food, but no evidence of lack of palatability]
404	2005. USDA NRCS. Plant Fact Sheet: Dwarf Wax Myrtle- Myrica pusilla Raf.. http://plants.usda.gov/factsheet/pdf/fs_mypu.pdf	Stutzenbaker (1999) reports wax myrtle to be durable, able to withstand periodic burning, flooding, drought, and heavy grazing by livestock. [apparently tolerant of grazing by livestock, indicating species is palatable to animals]
404	2007. Van Dersal, W.. Native Woody Plants of the United States. Read Country Books, Alcester, UK	leaves refused by captive marsh rabbits
405	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Wax-myrtle is unpalatable to white-tailed deer in eastern Texas [24,25]. Its palatability to cattle is unreported. [no evidence of toxicity to animals]
405	2005. USDA NRCS. Plant Fact Sheet: Dwarf Wax Myrtle- Myrica pusilla Raf.. http://plants.usda.gov/factsheet/pdf/fs_mypu.pdf	No evidence of toxicity
406	1994. Gilman, E.F./Watson, D.G.. Myrica cerifera - Southern Waxmyrtle. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL http://hort.ufl.edu/trees/MYRCERA.pdf	Pests Caterpillars and mites may occasionally attack the foliage. Webworms common in some landscapes - prune to remove infestation. Diseases Cankers may form on old branches and trunks and kill them. Also, a lethal wilt disease caused by the fungus Fusarium oxysporum and Fusarium spp. Has been recently noted attacking Waxmyrtle plants in central and south Florida. The vascular tissue is irregularly stained purple but not decayed as a result of the disease. Root injury and nitrogen fertilization encourage the disease.
407	2010. Floridata. Myrica cerifera. Floridata.com, Tallahassee, Florida http://www.floridata.com/ref/m/myrica.cfm	No evidence of toxicity to humans
407	2010. Pollen Library. Southern Bayberry (Morella cerifera). SDI Health LLC, http://www.pollenlibrary.com/Specie/Morella+cerifera/	Allergenicity: Southern Bayberry (Morella cerifera) is a mild allergen. [not considred a severe allergen]
408	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	It competes with pine seedlings and contribute to an accumulation of understory fuels which increases the potential for damaging wildfires
408	2000. Haywood, J.D./Pearson, H.A./Grelen, H.E./Popham, T.W.. Effects of Date and Frequency of Burning on Southern Bayberry (Myrica cerifera) in Central Louisiana. Texas Journal of Science. 52: 33-42.	Myrica cerifera (southern bayberry or waxmyrtle) is one of the most common shrubs in the longleaf pine/bluestem forest type in the West Gulf Coastal Plain. During controlled burns, individual plants can burn intensely because the wax coated foliage and fruits are very flammable... However, Myrica cerifera is adapted to survival on frequently burned longleaf pine sites by resprouting vigorously from the root collar. [along with ability to form thickets, can increase fire risk in invaded ecosystems]
409	1994. Gilman, E.F./Watson, D.G.. Myrica cerifera - Southern Waxmyrtle. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL http://hort.ufl.edu/trees/MYRCERA.pdf	shade tolerant
409	1996. Garrett, H.. Howard Garrett's Plants for Texas. University of Texas Press, Austin, TX	Location: Sun to part shade.

410	1994. Gilman, E.F./Watson, D.G.. Myrica cerifera - Southern Waxmyrtle. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL http://hort.ufl.edu/trees/MYRCERA.pdf	Soil tolerances: clay; loam; sand; acidic; alkaline; extended flooding; well-drained
410	1996. Garrett, H.. Howard Garrett's Plants for Texas. University of Texas Press, Austin, TX	Easy to grow in any soil, drought tolerant.
411	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Wax-myrtle is an erect, evergreen, small tree or shrub. [not climbing or smothering]
412	1995. Tolliver, K.S./Colley, D.M./Young, D.R.. Effects of Myrica cerifera on Pinus taeda. American Midland Naturalist. 133: 256-263.	Myrica cerifera forms dense persistent thickets on rear dunes and swales of Atlantic coast barrier islands (Ehrenfeld, 1990; Young et al., 1992) and is an important midsuccessional species (Levy, 1990).
412	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	M. cerifera is native to coastal regions of the southeastern United States, where it is an early colonizer in areas undergoing primary and secondary succession and can form dense thickets (Duever and Riopelle 1983; Young et al. 1995).
412	2009. Tiner, R. W.. Field guide to tidal wetland plants of the northeastern United States and neighboring Canada: vegetation of beaches, tidal flats, rocky shores, marshes, swamps, and coastal ponds. Univ of Massachusetts Press, Amherst, MA	Irregularly flooded tidal marshes and swamps, occasionally forming dense thickets,
501	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Terrestrial tree [Not aquatic]
502	2007. Van Dersal, W.. Native Woody Plants of the United States. Read Country Books, Alcester, UK	Not a grass [Myricaceae]
503	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Morella cerifera (Myricaceae) is a symbiotic nitrogen fixer originally from the southeastern U.S. that is colonizing native-dominated vegetation on a young lava flow near Hilo, Island of Hawai'i, where it increases total and biologically available soil nitrogen and increases foliar nitrogen concentrations in associated individuals of the native tree Metrosideros polymorpha.
504	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Not a geophyte
601	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	No evidence of substantial reproductive failure in native habitat
602	1996. Garrett, H.. Howard Garrett's Plants for Texas. University of Texas Press, Austin, TX	Propagation: Seeds, cuttings, transplants.
603	1997. Bornstein, A.J.. Myricaceae. Oxford University Press, New York, NY	Further complicating matters, bayberry and the wax myrtle [Morella cerifera (L.) Small] can hybridize when growing together
604	2010. Floridata. Myrica cerifera. Floridata.com, Tallahassee, Florida http://www.floridata.com/ref/m/myrica.cfm	Whenever possible choose female plants (and of course at least one male) as only these produce the waxy blue berries so beloved by birds. [dioecious tree]
605	2010. Moore, G.. Morella caroliniensis. USDA Forest Service, http://www.fs.fed.us/global/iitf/pdf/shrubs/Morella%20caroliniensis.pdf	Bayberry is wind pollinated and blooms in the spring. [description is for Morella caroliniensis but floral structure is similar]

606	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Wax-myrtle is clonal, with several stems growing from a common root collar. Underground runners extend the growth laterally
606	1994. Gilman, E.F./Watson, D.G.. Myrica cerifera - Southern Waxmyrtle. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL http://hort.ufl.edu/trees/MYRCERA.pdf	The only drawback to the plant is its tendency to sprout from the roots. This can be a nuisance as they need to be removed several times each year to keep the tree looking sharp. However, in a naturalized garden this thick growth could be an advantage, since it would provide good nesting cover for wildlife.
606	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	M. cerifera also has the ability to spread vegetatively via root suckers (Dirr 2002).
607	1994. Gilman, E.F./Watson, D.G.. Myrica cerifera - Southern Waxmyrtle. Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL http://hort.ufl.edu/trees/MYRCERA.pdf	Growth rate: fast
701	2008. Bonner, F.T./Karrfalt, R.P.. The Woody Plant Seed Manual. Government Printing Office, Washington, D.C.	Morella cerifera drupe, 3 mm length [potential for unintentional dispersal, but no evidence]
702	1996. Garrett, H.. Howard Garrett's Plants for Texas. University of Texas Press, Austin, TX	Uses: Specimen garden tree; evergreen background.
703	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Bird-dispersed
703	2010. WRA Specialist. Personal Communication.	No evidence of contamination of produce
704	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	It produces a large number of small fruits (Dirr 1998), which are bird dispersed in its native range, and almost certainly in Hawai'i as well (McClanahan and Wolfe 1993). [not adapted for wind dispersal]
705	2005. USDA NRCS. Plant Fact Sheet: Dwarf Wax Myrtle- Myrica pusilla Raf.. http://plants.usda.gov/factsheet/pdf/fs_mypu.pdf	It is believed that the waxy coating may help prevent the fruit from drying out in arid climates and may help to keep water borne fruits afloat in wetter ones...A close relative of dwarf wax myrtle is common wax myrtle (Myrica cerifera). Common wax myrtle grows from 10-30 feet tall, is not stoloniferous, and is the only evergreen wax myrtle with wedge shaped leaves. It is usually found in clay soils near streams, lakes, and other waterways, as well as in boggy grasslands and wet wooded areas.
706	1993. Kalmbacher, R. S./Eger, Jr., J. E./Rowland-Bamford, A. J.. Response of Southern Wax Myrtle (Myrica cerifera) to Herbicides in Florida. Weed Technology. 17: 84-91.	Seed dispersal by birds is a major method for spread of this species (2). It is the main food of tree swallows (Iridoprocne bicolor) when these birds winter in Florida and the Gulf area (3).
706	1996. Garrett, H.. Howard Garrett's Plants for Texas. University of Texas Press, Austin, TX	Tips/Notes: Birds like the berries.
706	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Like M. faya, M. cerifera is relatively fast growing (Young et al. 1995), bird dispersed (McClanahan and Wolfe 1993, Levey et al. 2005), and fixes nitrogen via a symbiosis with actinorhizal bacteria, Frankia (Burleigh and Dawson 1994, Wijnholds and Young 2000).
707	2004. Borgmann, K.L./Pearson, S.F./Levey, D.J./Greenberg, C.H.. Wintering Yellow-Rumped Warblers (Dendroica coronata) Track Manipulated Abundance of Myrica cerifera Fruits. The Auk. 121: 74-87.	Adapted for internal bird/animal dispersal
707	2010. WRA Specialist. Personal Communication.	No evidence of external dispersal or means of external attachment

708	2004. Borgmann, K.L./Pearson, S.F./Levey, D.J./Greenberg, C.H.. Wintering Yellow-Rumped Warblers (Dendroica coronata) Track Manipulated Abundance of Myrica cerifera Fruits. The Auk. 121: 74-87.	We suspect that the importance of M. cerifera fruits to wintering birds extends beyond what we detected for Yellow-rumped Warblers. During the course of our study, we observed seven other species consuming M. cerifera fruits: Downy Woodpecker (Picoides pubescens), Red-bellied Woodpecker (Melanerpes carolinus), Carolina Chickadee, Northern Cardinal, Ruby- crowned Kinglet, Tufted Titmouse, and Pine Warbler (D. pinus). Furthermore, fecal samples from wintering Gray Catbirds (Dumetella carolinensis), White eyed Vireos (Vireo griseus), and Ruby crowned Kinglets at our study site frequently were composed of >90% M. cerifera fruit (S. F. Pearson unpubl. data). We emphasize that all those species were much less common than Yellow-rumped Warblers at our study site (Table 1). Hence, low sample sizes and reduced statistical power (power of treatment x time interactions for canopy, shrub, and foraging abundance were <0.68 for all species other than the Yellow-rumped Warbler) likely contributed to those species' apparent lack of response to our experimental manipulation of M. cerifera fruit abundance. Although those species did not respond to changes in fruit abundance, M. cerifera may still be an important resource for them.
801	2010. WRA Specialist. Personal Communication.	Potential seed densities of >1000/m2 unlikely given size of trees
802	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Seedlings will establish on disturbed sites [39], but the seeds require removal of their waxy coating before they will germinate [20]. Birds, feeding on southern bayberry fruit, probably accomplish wax removal and seed dispersal. [suggest the potential to develop a seed bank]
803	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	A 20 percent Garlon 4, 10 percent Cide-kick (a penetrant), 70 percent diesel-oil herbicide mixture can be used for wax-myrtle control. Basal applications should be made in February, using the "streamline" technique [32].
803	1993. Kalmbacher, R. S./Eger, Jr., J. E./Rowland-Bamford, A. J.. Response of Southern Wax Myrtle (Myrica cerifera) to Herbicides in Florida. Weed Technology. 17: 84-91.	Abstract. Triclopyr (0.28, 0.56, and 1.12 kg ai ha-l); triclopyr + 2,4-D (0.56 + 1.12 kg ha l); and dicamba (1.12 kg ha-1) were evaluated over 2 yr at two locations in Florida for southern wax myrtle control following spring (Mar. to Apr.) or summer (Aug. to Sept.) applications. All treatments were applied twice, 1 yr apart, except 1.12 kg ha-' triclopyr, which was applied once in the initial year. In the first year, defoliation with triclopyr was quadratic with > 90% at 0.56 kg ha-l. In the second year, a single application of 1.12 kg ha ' triclopyr resulted in similar (P > 0.05) defoliation compared with two applications of 0.56 kg ha-1 triclopyr. After 1 yr, increasing triclopyr rate resulted in a linear increase in mortality. After 2 yr, two applications of triclopyr at 0.56 kg ha-1 and triclopyr + 2,4 D caused lower (P < .01) mortality (45%) than a single application of 1.12 kg ha-1 triclopyr (63%). Addition of 2,4-D to triclopyr did not increase mortality. After 2 yr, two applications of 0.28 kg ha-1 triclopyr resulted in 21% mortality while two applications of dicamba were ineffective. Defoliation was often greater with spring, compared with summer applications, but often depended on treatment and location. Mortality was greater (P < 0.01) at 1 and 2 yr after summer application compared with spring application at one location, but not the other. Roots of wax myrtle were sampled on 28-d intervals in the first year and analyzed for total non structural carbohydrate (TNC). Starch composed 630 g kg-' of TNC in myrtle roots, with highest concentration of TNC (120 g kg1) in March and lowest (30 g kg-1) in August. Nomenclature: Dicamba, 3,6 dichloro 2-methoxybenzoic acid; 2,4-D, (2,4 dichlorophenoxy)acetic acid; triclopyr, [(3,5- 6 trichloro-2-pyridinyl)oxy]acetic acid; southern wax myrtle, Myrica cerifera L. #3 MYRCE. Additional index words: Pasture and range brush control, triclopyr, 2,4-D, dicamba, MYRCE.
804	1991. Van Deelen, T.R.. Myrica cerifera. In: Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer), http://www.fs.fed.us/database/feis/	Tests of burning, chopping, and blading methods for wax-myrtle control found that wax-myrtle can return to pretreatment levels within 3 years...Wax-myrtle stems die quickly. The stems and foliage of southern bayberry contain large amounts of aromatic compounds that are quite flammable [6], making it a potential fire hazard. Presumably, severe enough fires will kill wax-myrtle rootstock, although no such instances were reported in the literature. The rootstock is apparently quite hardy. PLANT RESPONSE TO FIRE : Wax-myrtle sprouts vigorously from surviving root crowns following fire [2]. The most vigorous growth occurs in the 1st postfire year [1]. Stem density and frequency increase rapidly relative to cover. Cover increases less rapidly because the wax-myrtle clones are self-thinning [2,44].

804	1993. Kalmbacher, R. S./Eger, Jr., J. E./Rowland-Bamford, A. J.. Response of Southern Wax Myrtle (Myrica cerifera) to Herbicides in Florida. Weed Technology. 17: 84-91.	On range, wax myrtle can be suppressed by burning (10). Southeastern range is typically burned every 2 to 3 yr, an interval which allows for a build-up in sufficient fuel to carry a fire up into the wax myrtle canopy. On pasture, notably bahiagrass (Paspalum notatum Flugge), there is usually not sufficient fuel to destroy a wax myrtle canopy, especially in late winter.
804	2000. Haywood, J.D./Pearson, H.A./Grelen, H.E./Popham, T.W.. Effects of Date and Frequency of Burning on Southern Bayberry (Myrica cerifera) in Central Louisiana. Texas Journal of Science. 52: 33-42.	Description: Myrica cerifera (southern bayberry or waxmyrtle) is one of the most common shrubs in the longleaf pine/bluestem forest type in the West Gulf Coastal Plain. During controlled burns, individual plants can burn intensely because the wax coated foliage and fruits are very flammable. However, Myrica cerifera can survive tires on frequently burned sites by resprouting vigorously from the root collar. To determine how burning influences the development of Myrica cerifera, this study compared several burning dates (1 March, 1 May and 1 July) and tire frequencies (one, two and three year intervals) on a site in central Louisiana. Myrica cercpra plants generally survived all burning treatments, with only two plants dying over eight growing seasons (1.3% mortality). Burning kept average shrub height at or below the initial preburn heights and significantly below the height of the non burned plants. Final average heights and diameters of Myrica cerifera decreased significantly as the burning frequency increased and the date of burning was delayed into the growing season.
804	2006. Burrell, C. C./Marinelli, J./Harper-Lore, B.. Native alternatives to invasive plants. Brooklyn Botanic Garden, Brooklyn, NY	If necessary, cut the plant to the ground to renew growth. It tolerates fire, drought, salt and heat.
805	2008. Kurten, E. L./Snyder, C. P./Iwata, T./Vitousek, P. M.. Morella cerifera invasion and nitrogen cycling on a lowland Hawaiian lava flow. Biological Invasions. 10: 19-24.	Apparently natural enemies not stopping spread of Morella cerifera in Hawaiian Islands