

Protection and Conservation of Endangered  
Havana Clustervine (*Jacquemontia havanensis*)  
in South Florida

THE INSTITUTE FOR REGIONAL CONSERVATION,  
22601 S.W. 152 AVENUE  
MIAMI, FLORIDA 33170

GEORGE D. GANN AND KEITH A. BRADLEY (IRC),  
AND JANICE A. DUQUESNEL (FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION)



Report submitted to  
Florida Department of Environmental Protection  
Bureau of Natural and Cultural Resources  
Tallahassee, Florida

June 28, 2001

### ACKNOWLEDGEMENTS

James G. Duquesnel of the Florida Department of Environmental Protection (FDEP), Meghan Fellows and Jennifer Possley of Fairchild Tropical Garden, and Steven W. Woodmansee of the Institute for Regional Conservation assisted with field surveys. FDEP Bureau of Natural and Cultural Resources contributed funding for the work described herein. Fairchild Tropical Garden contributed the use of a Trimble GPS unit at Dagny Johnson Key Largo Hammocks Botanical State Park. The U.S. Fish and Wildlife Service provided access for surveys to the National Key Deer Refuge on Big Pine Key. Kenneth R. Robertson of the Center for Biodiversity, Illinois Natural History Survey provided useful information from his long-term studies of the Genus *Jacquemontia*. Fernand Jacquemond of the Conservatoire Botanique de la Ville in Geneva, Switzerland provided information on a specimen housed there. As with many of our projects, the unpublished field notes of the late botanist George N. Avery proved invaluable during the course of this work.

### AFFILIATIONS OF THE AUTHORS

George D. Gann and Keith A. Bradley are biologists with the Institute for Regional Conservation in Miami, Florida. Janice A. Duquesnel is a biologist with the Florida Department of Environmental Protection, Florida Park Service, District 5, Key Largo, Florida.

Figure 1: Flower of Havana Clustervine



Photo by James G. Duquesnel

### INTRODUCTION

Havana clustervine (*Jacquemontia havanensis* (Jacq.) Urb.) is a perennial vine in the Convolvulaceae (Figures 1-3). It is native to Florida, the West Indies, Mexico, and Central America (Robertson 1971). In Florida, Havana clustervine is known only from Monroe County in the Florida Keys. It is currently known in the continental United States only at Dagny Johnson Key Largo Hammocks Botanical State Park on North Key Largo and at Bahia Honda State Park (Figure 4). It is listed as endangered by the Florida Department of Agriculture and Consumer Services and as critically imperiled by the Florida Natural Areas Inventory. Two synonyms used for Florida plants are *J. jamaicensis* (Jacq.) Hallier f. and *Convolvulus nodiflorus* Desv. Recent references for Havana clustervine are Nelson (1996), Wunderlin (1998), and Chafin (2000).

Alan H. Curtiss made the first verifiable collection of Havana clustervine from Florida in 1882 on Bahia Honda Key, in what is now Bahia Honda State Park. Curtiss made a second collection there in 1896. It also was collected on Bahia Honda Key by John Kunkel Small in 1916, by Daniel B. Ward in 1964, and by Keith A. Bradley in 1995. It has been observed at Bahia Honda State Park by a number of botanists and included on a number of plant lists for the site (e.g., Hammer 1991, Bradley et al. 1995, Florida Department of Environmental Protection 1999). Most of the plants are located to the north of the parking lot at Sandspur Beach where it was reported by Weiner (1980, as amended). In 2000, Janice A. Duquesnel discovered a second station at Bahia Honda State Park to the southwest of the Sandspur Beach parking lot.

Figure 2: Habit of Havana Clustervine at Key Largo



Curtiss discovered the next station on Boca Chica Key in 1891. It was not seen there again until 1965 when George N. Avery observed a single plant growing on rock fill on the southwest point of the island (Botanical Notes of G.N. Avery, 25 November 1965). Robert W. Long and others collected a specimen from Boca Chica Key in 1966, presumably from the same station. Robertson (1971) cites a collection by Curtiss from No Name Key in 1896, but this seems to be in error. Although

we have not observed the specimen that Robertson reports (5631, G), it has the same collection number used by Curtiss on a collection of *J. pentanthos* from No Name Key

(5631, NY), which we have inspected. According to Fernand Jacquemond of the Conservatoire Botanique de la Ville in Geneva, Switzerland, the specimen cited by Robertson was originally labeled as *J. violacea* (= *J. pentanthos*) by Curtiss and was later annotated to *J. havanensis* by Robertson (personal communication, 27 June 2001). It seems likely that this specimen was actually collected on Bahia Honda Key or Boca Chica Key and was later mislabeled. A specimen deposited at the Everglades National Park herbarium and collected by Frank C. Craighead and George N. Avery in 1963 is labeled as having been collected on Big Pine Key. Strangely, this location is not mentioned in Avery's botanical notes. Avery's notes include observations from Bahia Honda Key in 1963 and 1964, and Boca Chica Key in 1965, so the Craighead and Avery specimen probably represents a mislabeled specimen from Bahia Honda Key.

William G. Atwater collected Havana clustervine first on North Key Largo in 1959. This station is within what is now Dagny Johnson Key Largo Hammocks Botanical State Park. George N. Avery made additional collections there in 1971, as did Ruben P. Sauleda and Diane K. Sauleda in 1982. Most of the plants at this station are growing along the edge of Crossroads Hammock (hammock L1/9 in Weiner 1980), which is divided into four pieces by the intersection of Card Sound Road and County Road 905. Most of the plants are growing along the roadside. Curiously, Art Weiner and Karen Achor did not observe plants at this station when they surveyed it in June 1977 (Weiner 1980). In 1982, Karen Achor (in Weiner 1980, as amended) reported Havana clustervine for Oak Trail Hammock (hammock L1/10a in Weiner 1980), which is located across Dispatch Slough to the east of Crossroads Hammock. Gann and Duquesnel have not observed Havana clustervine in Oak Trail Hammock despite surveys of that hammock in August 2000 (see Gann 2000). It is possible that this was a transcription error, since Weiner and Achor did not record Havana clustervine for Crossroads hammock where it is evident.

Figure 3: Habit of Havana Clustervine at Bahia Honda



It was not clear what the natural habitat was for this species on North Key Largo until 2000, when George D. Gann and Janice A. Duquesnel found additional plants in the ecotone between Crossroads Hammock to the north of the main station, and Dispatch Slough to the east. Plants at Dagny Johnson Key Largo Hammocks Botanical State Park were mapped in 2001 by Gann, Duquesnel, Florida Park Service biologist James G. Duquesnel, and Fairchild Tropical Garden biologists Megan Fellows and Jennifer Posley. Seventy-five points with live plants were recorded in the southern colony (Colony One), and twenty points with live plants were recorded in the northern colony (Colony Two). A few points represented more than one plant growing in close proximity to each other. Interestingly, nine dead plants were noted at Colony One and three dead plants were noted at Colony Two in what appears to be attrition resulting from the restoration of water flow in Dispatch Slough.

Robertson (1971) placed *Convolvulus garberi* Chapm. into synonymy under *Jacquemontia havanensis*, but did not see the actual specimen. The location of the

specimen is unknown (K.R. Robertson, personal communication). Abram P. Garber collected the type specimen of *Convolvulus garberi* before 1878 at Cape Florida in Miami-Dade County (Chapman, 1883), although in 1878 Chapman incorrectly cited the locality as Cape Sable in Monroe County. This specimen almost certainly represents a collection of *J. reclinata*. A specimen cited by Robertson (1971) from Virginia Key in Miami-Dade County, collected by Simpson (544, F), is actually a specimen of *J. reclinata*. Specimens from the herbarium of S.C. Hood collected from Miami in 1910 and 1912, that have been labeled *J. havanensis*, apparently are all *J. curtissii* (see Robertson 1971).

In June 2001, George D. Gann sought funds from the Florida Department of Environmental Protection, Bureau of Natural and Cultural Resources, to map the plants at Bahia Honda State Park, conduct additional surveys in the lower Florida Keys, develop monitoring protocols, and write a report on the status of Havana clustervine in South Florida. This project was initiated on June 21, 2001.

### OBJECTIVES

- 1) Map plants at Bahia Honda State Park;
- 2) Survey potential habitat for additional Havana clustervine on Boca Chica Key and Big Pine Key;
- 3) Provide a general description of Havana clustervine habitat;
- 4) Develop monitoring protocols for known or newly found occurrences of Havana clustervine;
- 5) Develop conservation goals including an analysis of possible augmentation or reintroduction needs.

### METHODS

- 1) Use a Trimble GPS unit to map plants at Bahia Honda State Park;
- 2) Produce maps of plants at Bahia Honda State Park and Dagny Johnson Key Largo Hammocks Botanical State Park;
- 3) Survey appropriate habitat on Boca Chica Key, and in the National Key Deer Refuge on Big Pine Key on Long Beach and along the margins of Cactus Hammock;
- 4) Note general habitat requirements of Havana clustervine during the surveys;
- 5) Develop recommendations for further surveys;
- 6) Develop monitoring protocols for all occurrences;
- 7) Develop conservation goals including an analysis of possible augmentation or reintroduction needs.

### MAPPING OF PLANTS AT BAHIA HONDA STATE PARK

Janice A. Duquesnel and Keith A. Bradley mapped plants at Bahia Honda State Park with a Trimble GPS unit on June 22, 2001. 107 points were recorded of which 100 were located at the station to the northeast of the Sandspur Beach parking lot (Colony One), and seven were located at the station to the southwest of the Sandspur Beach parking lot (Colony Two). No dead plants were observed. Unlike at Dagny Johnson Key Largo

Hammocks Botanical State Park, most points represent more than one individual in a small patch.

#### PRODUCTION OF MAPS OF KNOWN PLANTS

Maps were created for both Bahia Honda State Park and Dagny Johnson Key Largo Hammocks Botanical State Park. For Bahia Honda State Park, two maps show the natural communities of the park and the location of mapped points of Havana clustervine (Figures 5-6), and three maps show locations of mapped points on color infrared aerial photographs (Figures 7-9). At Dagny Johnson Key Largo Hammocks Botanical State Park, one map shows the natural communities of the park and the location of mapped points of Havana clustervine (Figure 10), and two maps show locations of mapped points on color infrared aerial photographs (Figures 11-12).

#### SURVEYS FOR PLANTS IN THE LOWER FLORIDA KEYS

Keith A. Bradley and Steven W. Woodmansee conducted surveys for Havana clustervine in the lower Florida Keys on June 26 and June 27, 2001. Bradley and Woodmansee had previously surveyed a portion of Boca Chica Key on June 6, 2001. Additional habitat on Boca Chica Key was surveyed on June 26, while potential habitat on Big Pine Key in the National Key Deer Refuge was surveyed on June 27, 2001. Because of similarity to habitat at Bahia Honda, we chose to survey Long Beach on the southeastern point of Big Pine Key, and due to similarity of habitat to that at Dagny Johnson Key Largo Hammocks Botanical State Park, we chose to survey the ecotone of Cactus Hammock as it intergraded into tidal marsh. No new plants of Havana clustervine were observed during these surveys.

#### HAVANA CLUSTERVINE HABITAT

Small (1933), Long & Lakela (1976), and Wunderlin (1998) all reported that the habitat of Havana clustervine in southern Florida is hammocks. Correll & Correll (1982) reported Havana clustervine for both coppices (hammocks) and pinelands in the Bahamas. Liogier & Martorell (2000) reported it for coastal thickets in Puerto Rico. Using the Florida Natural Areas Inventory (1997) system, the true habitats for Havana clustervine in South Florida appear to be the margins of rockland hammocks and sandy coastal uplands including beach dunes and openings on coastal berms.

At Bahia Honda State Park, in Colony One plants are growing in sunny openings on beach dune behind the fore dune and along the edge of the coastal berm. Plants are growing approximately 30 m to 90 m inland from mean high tide. The habitat is typically composed of open sand with some grasses, especially sandspurs (*Cenchrus* spp.), scattered shrubs and small trees such as blackbead (*Pithecellobium keyense*), white indigoberry (*Randia aculeata*), silver palm (*Coccothrinax argentata*), and smallflower lilythorn (*Catesbaea parviflora*), vines such as fragrant swallowwort (*Cynanchum northropiae*), and herbs such as Garber's spurge (*Chamaesyce garberi*). In Colony Two, the plants are found in the fore dune with sea oats (*Uniola paniculata*), railroad vine (*Ipomoea pes-caprae* ssp. *brasiliensis*), and sandspurs (*Cenchrus* spp.), as well as on the coastal berm with several hardwoods species including seagrape (*Coccoloba uvifera*), blacktorch (*Erithalis fruticosa*), and Spanish stopper (*Eugenia foetida*). Plants are

growing from approximately 30 m to 65 m inland from mean high tide. At both colonies, the plants are growing in calcareous sands mostly derived from marine algae.

At Dagny Johnson Key Largo Hammocks Botanical State Park, in Colony Two Havana clustervine grows in openings along the eastern face of the hammock as it intergrades with Dispatch Slough. Because of the changing hydrology of the slough, due first to road construction and filling, and now from the removal of hydrological barriers to flow, it is difficult to determine with accuracy the historical associates of Havana clustervine. Nevertheless, the typical edge of the hammock is composed of West Indian mahogany (*Swietenia mahagoni*), silver thatch palm (*Thrinax morrisii*), wild dilly (*Manilkara jaimiqui* ssp. *emarginata*), buttonwood (*Conocarpus erectus*) and rhacoma (*Crossopetalum rhacoma*). Sawgrass (*Cladium jamaicense*) can be found in close proximity to Havana clustervine. Interestingly, quailberry (*Crossopetalum ilicifolium*), a plant usually associated with pine rocklands in South Florida, is an associate of this colony. In this particular habitat, the primary environmental requirements appear to be mesic substrate and substantial sunlight. In Colony One, plants are growing along the intersection of Card Sound Road and County Road 905 in similar conditions. The plants growing in full sunlight along the southern edge of the northeastern piece of the hammock appear to be healthiest plants in this colony. Some plants are growing in disturbed soils or on limestone rocks that were placed as barriers to block access to the eastern end of Card Sound Road in the mid-1980s.

#### RECOMMENDATIONS FOR FURTHER SURVEYS

Due to the broad range of Havana clustervine in the Florida Keys, it could be found virtually anywhere in the Florida Keys where habitat is present, and botanists should always be aware of this possibility whenever working in the Florida Keys. However, future surveys should concentrate on areas where there is a high probability of finding new plants, including Avery Hammock and Oak Trail Hammock in Dagny Johnson Key Largo Hammocks Botanical State Park, and Long Beach and the edges of Cactus Hammock in National Key Deer Refuge. At a minimum, surveys for new plants should be conducted every five years.

#### MONITORING RECOMMENDATIONS

Havana clustervine is critically imperiled in South Florida and could still be lost due to a variety of factors including hurricanes, exotic species invasions, and management error. However, colonies at both sites appear healthy and annual monitoring should suffice unless conditions change due to storm events, rapid invasions of exotic pest plants or other factors. At a minimum, population sizes should be estimated annually at each colony using a Log<sub>10</sub> scale (1-10, 11-100, etc.). Individual plants, or small patches of plants when necessary, should be re-mapped every five years. Also, re-vouchering of plants at each site is recommended every ten years, provided that population sizes are not critically small. In the case of Bahia Honda State Park, this would not be until 2005, but in the case of plants at Dagny Johnson Key Largo Hammocks Botanical State Park, the most recent specimen was collected in 1982. A herbarium specimen should be collected the next time this population is in flower.

## PROTECTION AND CONSERVATION GOALS

Several factors pose a threat to Havana clustervine in South Florida. The primary threat at the present time is probably exotic pest plant invasions. The Florida Park Service has done an exemplary job of removing exotic pest plants from its properties, and Havana clustervine has benefited from these activities. Nevertheless, this threat is constant, and continual management efforts must be made to prevent exotics from invading Havana clustervine habitat.

At Bahia Honda State Park, Havana clustervine is also threatened by pedestrian traffic. This problem has been partially resolved through the relocation of the nature trail in the park, so that it no longer intersects the area where Havana clustervine is present. However, this situation must be monitored to ensure that unnecessary foot traffic is prevented.

At Dagny Johnson Key Largo Hammocks Botanical State Park, Havana clustervine may be threatened by hydrological changes resulting from the restoration of water flow through Dispatch Slough. Some mortality has been noted among plants, especially along the eastern edge of Colony One (Figure 12). However, it is possible that the hydrological restoration will restore a more natural ecotone between Crossroads Hammocks and Dispatch Slough, and thus create more habitat for Havana clustervine in the long term. This situation would be worthy of more intensive monitoring.

At present, no augmentations of Havana clustervine seem appropriate at Bahia Honda State Park or Dagny Johnson Key Largo Hammocks Botanical State Park. Both populations appear healthy, although small, and there is no substantial evidence that either population was historically more widespread at either site. However, the reintroduction of Havana clustervine to Boca Chica Key should be considered if appropriate habitat within conservation lands is present.

## CITATIONS

Avery, G.N. 1983. Botanical notes of George Avery, south Florida botanist, 1922-1983. Fairchild Tropical Garden Archives.

Bradley, K., R.L. Hammer, & J. O'Brien. 1995. Checklist of vascular plants, Bahia Honda State Recreation Area, Monroe County, Florida. Emended by Keith Bradley, Roger L. Hammer, and Joe O'Brien, September 1995.

Chafin, L.G. 2000. Field Guide to the Rare Plants of Florida. Florida Natural Areas Inventory. Tallahassee, Florida.

Chapman, A.W. 1878. An enumeration of some plants - chiefly from the semi-tropical regions of Florida - which are either new, or which have not been hitherto been recorded as belonging to the flora of the southern States. *Bot. Gaz.* 3:2-6, 9-12, 17-21.



Chapman, A.W. 1883. Flora of the Southern United States. 2nd edition. John Wilson and Son. Cambridge.

Correll, D.S., and H.B. Correll. 1982. Flora of the Bahama Archipelago. J. Cramer, Germany.

Florida Department of Environmental Protection, Parks and Recreation District #5. 1999. Bahia Honda State Park vascular plant list. August 18, 1999.

Florida Natural Areas Inventory. 1997. Plants and Lichens, Vertebrates, Invertebrates, and Natural Communities Tracked by Florida Natural Areas Inventory. Florida Natural Areas Inventory. Tallahassee, FL.

Gann, G.D. 2000. Protection and conservation of endangered mahogany mistletoe (*Phoradendron rubrum*) at Key Largo Hammocks State Botanical Site. Institute for Regional Conservation. Miami, Florida. Report submitted to Florida Department of Environmental Resources. Tallahassee, Florida.

Hammer, R.L. 1991. Checklist of vascular plants, Bahia Honda State Park, Monroe County, Florida. Emended by Roger L. Hammer, December 1991.

Liogier, A.H., L.F. Martorell. 2000. Flora of Puerto Rico and adjacent islands. A systematic synopsis. 2nd edition. University of Puerto Rico. San Juan.

Long, R.W. & O. Lakela. 1976. A Flora of Tropical Florida. University of Miami Press. Coral Gables.

Nelson, G. 1996. The Shrubs & Woody Vines of Florida. Pineapple Press. Sarasota, Florida.

Robertson, K.R. 1971. A revision of the genus *Jacquemontia* (Convolvulaceae) in North and Central America and the West Indies. Ph.D. Dissertation, Washington University.

Small, J.K. 1933. Manual of the Southeastern Flora. The Science Press. Lancaster, Pennsylvania.

Weiner, Art H. 1980, as amended. The Hardwood Hammocks of the Florida Keys: An Ecological Study (1977-1986). The National Audubon Society.

Wunderlin, R.P. 1998. Guide to the Vascular Plants of Florida. University Press of Florida. Gainesville, Florida.