

**Status Survey of West Coast Dune Sunflower,
Helianthus debilis Nutt. subsp. *vestitus* (E. Watson) Heiser,
in Florida**

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Final report submitted by
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Section 1

Introduction

The west coast dune sunflower, *Helianthus debilis* Nutt. subsp. *vestitus* (E. Watson) Heiser, is a short lived perennial in the Asteraceae. While the species *H. debilis*, including other subspecies, is widespread in North America, subsp. *vestitus* is endemic to the west coast of Florida. Herbarium specimens of this subspecies have been collected in six counties from Pinellas and Hillsborough counties south to Lee County, a distance of approximately 165 km. Previous monographers of *Helianthus* in Florida, particularly Heiser (1956, 1969), have had no difficulty in distinguishing subsp. *vestitus* as a distinct subspecies. In fact Heiser (1969) remarks that solely on morphological grounds subsp. *vestitus* may be considered a distinct species from *H. debilis*. However, Heiser (1969) did find that the subsp. *vestitus* produced fertile artificial hybrids with *H. debilis* subsp. *debilis*, and thus continued to recognize it as a subspecies.

Gann et al. (2002) reported that the species was known from only two occurrences from Charlotte and Lee counties (excluding counties to the north), and that some populations of dune sunflower may in fact represent introduced populations of the East Coast Dune Sunflower (*H. debilis* subsp. *debilis*), which is endemic to the eastern coast of Florida.

Development has obviously had a tremendous impact on native coastal plants along Florida's coast. Many of the Florida's beaches that appear to be natural are in reality artificial or have been heavily modified, having been created from dredged sand and subsequently re-vegetated with nursery grown plant materials. Furthermore, with regards to the habitat for *H. debilis* subsp. *vestitus*, only a few small fragments of the west Florida coast have not been cleared, developed, re-nourished, or had roads built along them. This extensive destruction of natural beaches has eliminated habitat for *H. debilis* subsp. *vestitus*, and subsequent replanting projects (many of which were observed by the authors) typically did not use locally obtained germplasm, resulting in the frequent use of the East coast dune sunflower, rather than *H. debilis* subsp. *vestitus*. This use of the introduced subspecies (subsp. *debilis*) along the west coast has further complicated the status of *H. debilis* subsp. *vestitus*, especially because the two subspecies can potentially hybridize. Thus, only a few populations of *H. debilis* subsp. *vestitus* were believed to exist.

Methods

Existing data on the known historical distribution of west coast dune sunflower was compiled from herbarium label data and published and unpublished literature, as well as through communication with knowledgeable biologists and naturalists. Herbarium specimens were examined from Fairchild Tropical Botanic Garden (FTG), Harvard University (GH), Oscar Scherer State Park (FLSP), University of Florida (FLAS), University of South Florida (USF), U.S. National Herbarium (US). Label data was obtained for specimens at Marie Selby Botanical Garden (SEL) and the New York Botanical Garden (NY). Attempts to obtain label data from Indiana University (IND) were unsuccessful. Element occurrence data was also obtained from the Florida Natural Areas Inventory (FNAI).

Once the above data were compiled, sites where sunflower was reported from the last 15 years were surveyed by at least two observers. Any populations of *H. debilis* (either subspecies) that were found had their positions recorded with a Garmin GPS unit. Photographs were taken of plants at most stations, and herbarium vouchers were collected whenever doing so was permitted.

Once each known population was visited surveys were done for additional populations of sunflowers from Pinellas County south to northern Collier County, encompassing the entire historic range of the subspecies, as well as beaches to the south of its historic range. Potential sites to be surveyed were determined by examining maps, locating public beach sites, and by driving coastal roads in search of public beach access points.

A preliminary assessment of the cultivation of *H. debilis* in Florida was also done. The Internet was used to conduct searches for nurseries that grow the species. In addition, while surveying sites with cultivated plant materials (usually subsp. *debilis*) notes were taken on the source of materials when such information was available.

Results

Herbarium specimen label data showed that between 1894 and 1955 *H. debilis* subsp. *vestitus* had been collected from the Honeymoon Island and Clearwater Beach areas in Pinellas County south to Longboat Key, on the Sarasota/Manatee county line (Figure 2). Later, specimens were collected on several islands to the south, including Sanibel Island in 1957, Casey Key in 1962, and Manasota Key in 1991 (Figure 2). The Sanibel specimen collected in 1957, represents the first report for the island despite much botanical activity there. The collection was made by wildflower enthusiast Virginia Ducey. It is not reported for the island by George Cooley (1955), or Herwitz and Wunderlin (1990). Richard Workman (pers. comm.) says that W.C. Brumbach, who made extensive plant collections on Sanibel, told him specifically that it was never present on the island. Whether Ducey collected the specimen from wild or cultivated plants, an established population or a small ephemeral one is unknown.

The most densely hirsute specimens, and therefore those that conform most closely to the type specimen and published descriptions of *H. debilis* subsp. *vestitus*, are from Pinellas and Hillsborough counties. To the south, the amount of indument decreases, and plants become merely hispid, although some specimens are hirsute on new growth. Because no specimens were collected south of Longboat Key before 1957, it is difficult to know what the historical status and morphology of plants in this area were. It is possible that plants south of the Tampa Bay area were naturally less pubescent, more closely resembling *H. debilis* subsp. *debilis*. It is also possible that southern populations were not well established or very rare, accounting for a lack of early herbarium specimens.

Over the course of the study, more than 60 sites were surveyed (Figure 1, Table 1). Plants that we were confident in determining as subsp. *vestitus* were present at only seven stations, six of these being located within preserves. These populations were distributed from Honeymoon Island in Pinellas County south to Cayo Costa Island in Lee County. It is possible that some of the other surveyed stations may represent populations of *H. debilis* subsp. *vestitus*, but due to the reasons discussed earlier (regarding the introduced East Coast Dune sunflower and its presence

as well as potential hybridization with the West Coast Dune sunflower), we cannot say this with confidence. Those labeled in Figure 1 as hybrids are the most likely to have possibly been erroneously identified. Of further importance to note is that all of the known locations of *H. debilis* subsp. *vestitus* were located within 4 km of introduced *H. debilis* subsp. *debilis* plants, thus potentially further endangering the integrity of this subspecies. When introduced *Helianthus* was found in a preserve, the appropriate park biologists were notified and any relevant information and recommendations were passed on.

H. debilis was found to be commonly grown in nurseries. Indeed, in our field surveys we were constantly encountering its use in home, commercial, and roadside plantings. Thirty nurseries that are currently selling *H. debilis* in Florida are listed on www.plantfinder.com. Thirty-nine were listed on www.afnn.org. Much of the material that is grown may represent *H. debilis* 'Flora Sun' which was released by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service's Plant Material Center in Brooksville, Florida. "Flora Sun" was obtained from a population of *H. debilis* subsp. *debilis* collected in Jensen Beach, Martin County on the Florida East coast in 1977 (USDA 1994). The USDA and the University of Florida Cooperative Extension Service have promoted the use of 'Flora Sun' in sand dune stabilization, wind erosion protection, and beach beautification (USDA 1994, Norcini & Aldrich 2001). Despite a recommendation from these agencies that it not be used along the Florida West coast from Pasco to Collier counties to prevent crossing with subsp. *vestitus*, it is widely used in the area. Following introduction into landscapes and dune plantings, the introduced form spreads from seed, perpetuating itself.

Because of the abundance of introduced *H. debilis* subsp. *debilis* within the study area, we had to be particularly vigilant about the morphological characteristics of any population of *H. debilis* we observed. Along the west coast the introduction of these cultivated plant materials, which were observed to be spreading, make it so that we no longer have the luxury of dealing with allopatric subspecies as Heiser did (1956, 1969). While Heiser (1969) indicated that the subspecies were easily distinguished from one another by morphology, due to the present circumstances surrounding *H. debilis* we did not find that the subspecies were always clearly identifiable. Again, this may or may not be due to possible hybridization between the two subspecies, and additionally it is certainly possible that hybrids are also expanding their geographic range outside of the original range of subsp. *vestitus*.

Discussion

Additional work on the systematics of *H. debilis* in Florida is needed in order to fully understand the conservation needs of subsp. *vestitus*. Genetic studies of *H. debilis* may reveal differences between populations and subspecies that we could not observe in the field. It may also show direct evidence of hybridization. Based upon our surveys, we consider subsp. *vestitus* to be currently distributed from Pinellas County at Honeymoon Island, south to Cayo Costa Island in Lee County. We did not find plants that we considered subsp. *vestitus* in several areas where it was previously collected or reported including Longboat Key in Sarasota and Manatee counties. Most of the *H. debilis* growing within this range is now either subsp. *debilis* or possibly of hybrid origin.

Recommendations

The coastal areas within the historical range of subsp. *vestitus* have been extensively planted with introduced germplasm. Unfortunately, it is probably too late to reverse this problem. However, existing conservation lands on the west coast, especially those with populations of subsp. *vestitus*, should not allow commercially grown *H. debilis* into their parks unless the original germplasm can be verified as subsp. *vestitus*. Furthermore, it may be recommended that ex-situ populations of subsp. *vestitus* be established, and germplasm from such plants be used in future planting projects in parks. Existing populations of introduced plants in parks should be removed. Preserve managers should also try to limit planting of *H. debilis* on private properties, perhaps by educating nearby landowners and distributing material of *H. debilis* subsp. *vestitus*.

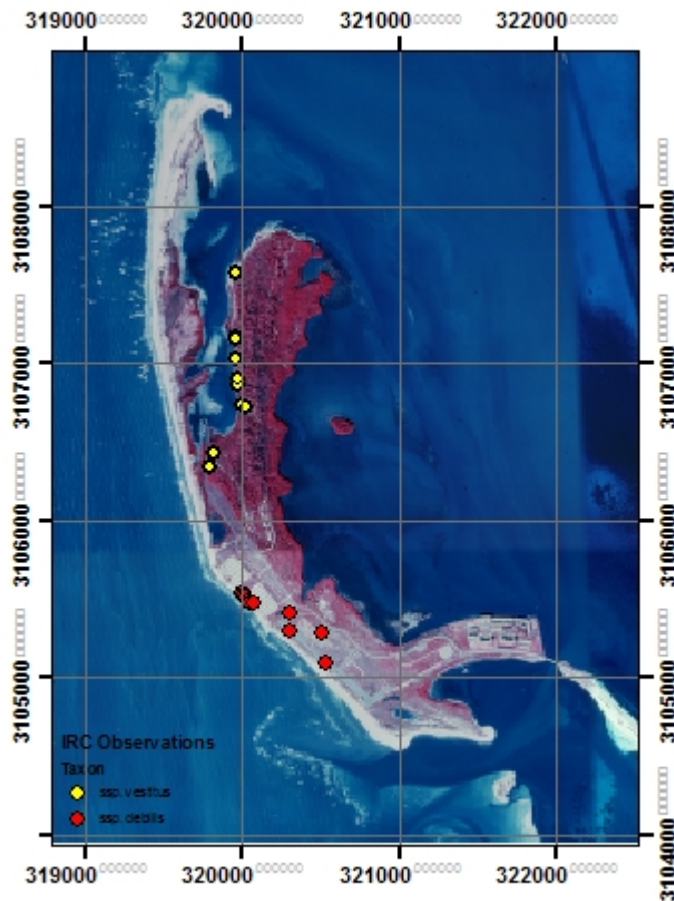
Section 2: Summary of extant *H. debilis* subsp. *vestitus* colonies

Sites are ordered from North to South. Maps are UTM Zone 17.

Occurrence 1: Honeymoon Island

Honeymoon Island, a Florida State Park, is the northern end of what was formerly Hog Island. Hog Island was split into two islands, now called Honeymoon and Caladesi in 1921 by a hurricane. The island to the south is Caladesi Island. Following construction of a bridge to the island in 1964, the island was the target of several developments, and much of the island as it exists now is fill material, particularly the southern end. Hog Island is the type locality of *H. debilis* subsp. *vestitus*. Specimens were collected on Hog Island in 1900 and 1901 by S.M. Tracy. Specimens were collected on Honeymoon Island in 1971 and 1979 by P. Genelle and G. Fleming.

The population of *H. debilis* subsp. *vestitus* on this island is threatened by introduced material of *H. debilis* subsp. *debilis*, which is planted extensively throughout the island. Plants of *H. debilis* subsp. *vestitus* remain in the more remote northern end of the park where subsp. *debilis* does not occur. This part of the island is intact as no fill was ever deposited here.

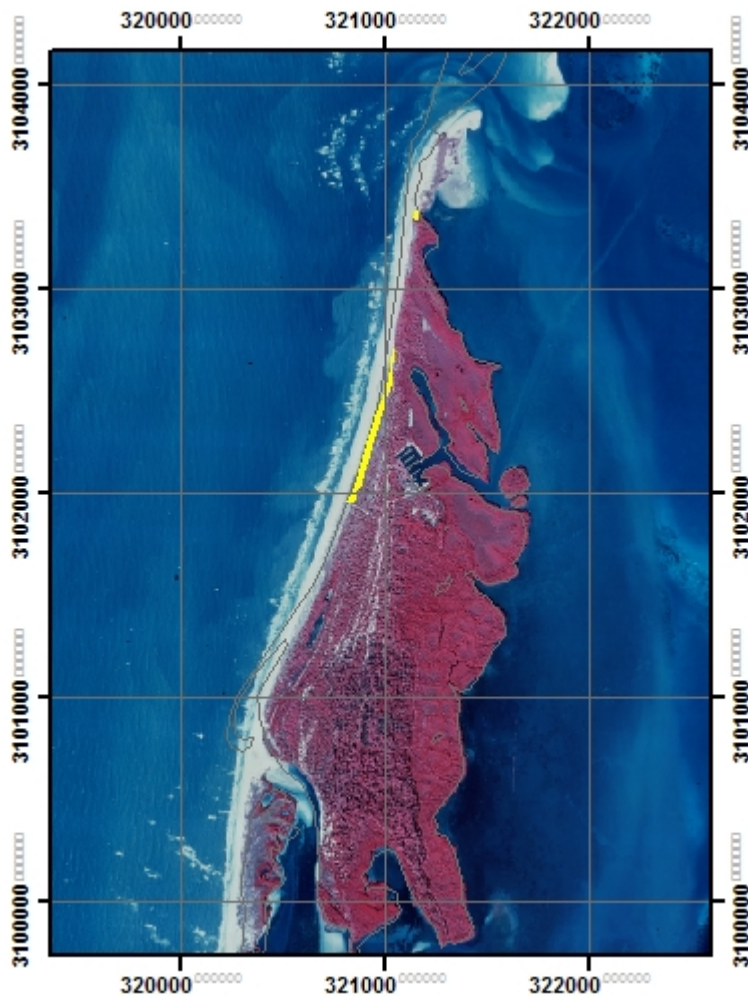


Occurrence 2: Caladesi Island

Caladesi Island, the north end of which is a Florida State Park, is the southern end of what was formerly Hog Island, which was split into two islands in 1921 by a hurricane. The island to the north is Honeymoon Island. Hog Island is the type locality of *H. debilis* subsp. *vestitus*. Specimens were collected on Hog Island in 1900 and 1901 by S.M. Tracy. A specimen was collected on Caladesi in 1979 by D. Chayet.

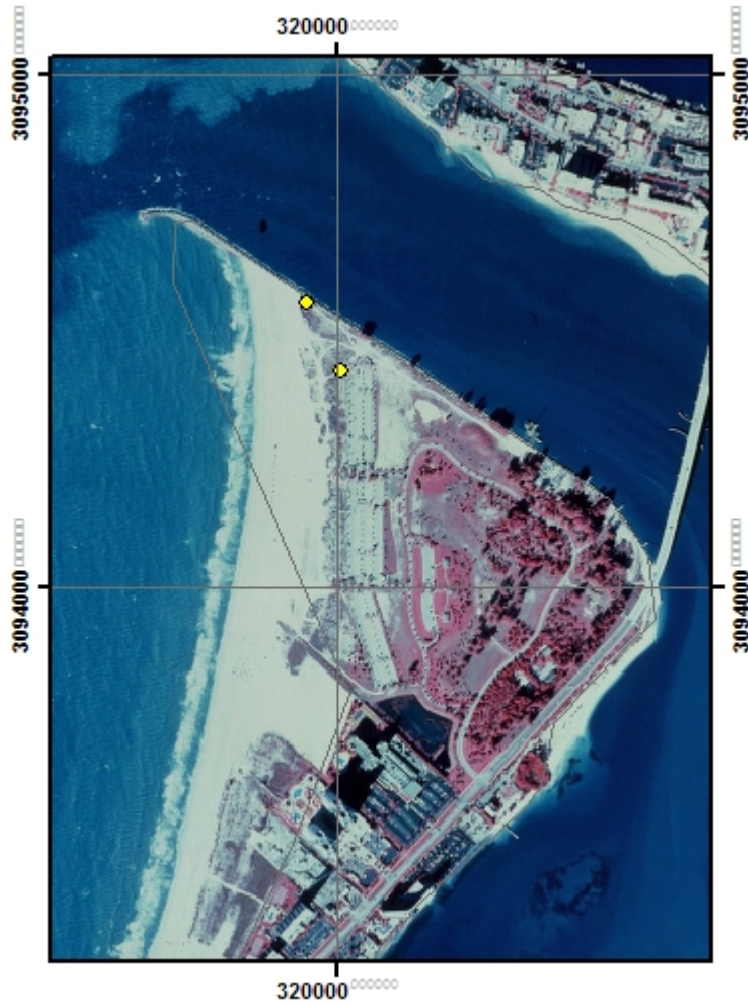
Caladesi Island supports a robust population of *H. debilis* subsp. *vestitus* at the northern end of the island. Hundreds of plants were observed behind the primary dune.

Care should be taken to prevent introduction of *H. debilis* subsp. *debilis* here from beachfront homes on the island just south of the state park, only about 3 km from this population.



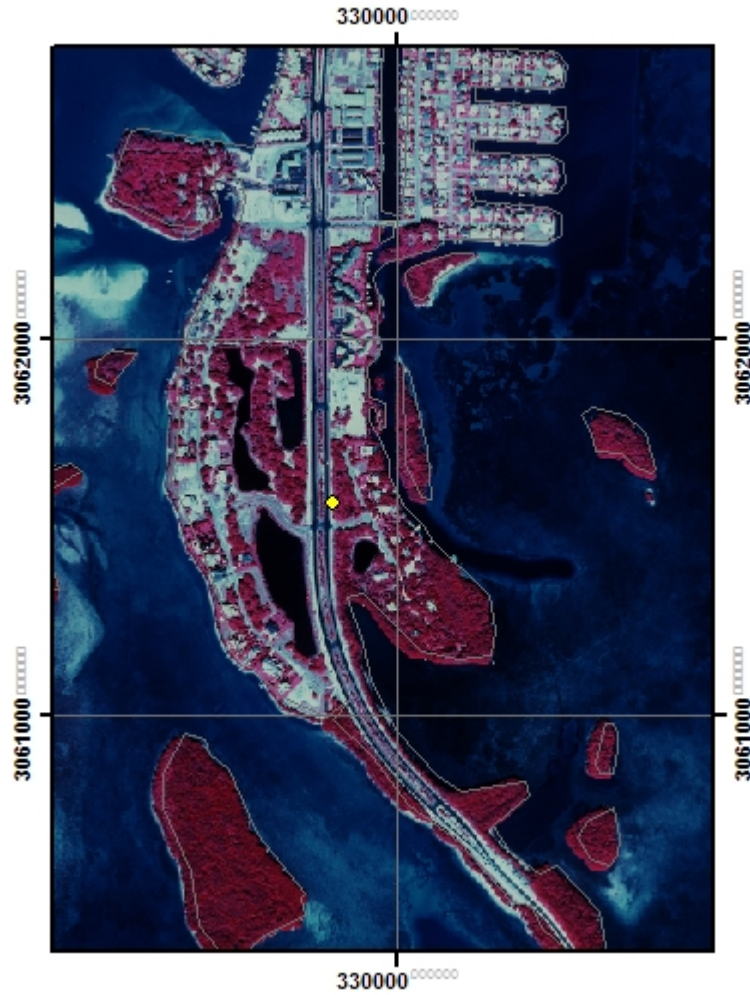
Occurrence 3: Sands Key Park

A few dozen plants of *H. debilis* subsp. *vestitus* are present on dunes and back dunes at Sands Key Park. These areas appear to have been replanting following beach renourishment. This station is also listed by FNAI (2002).



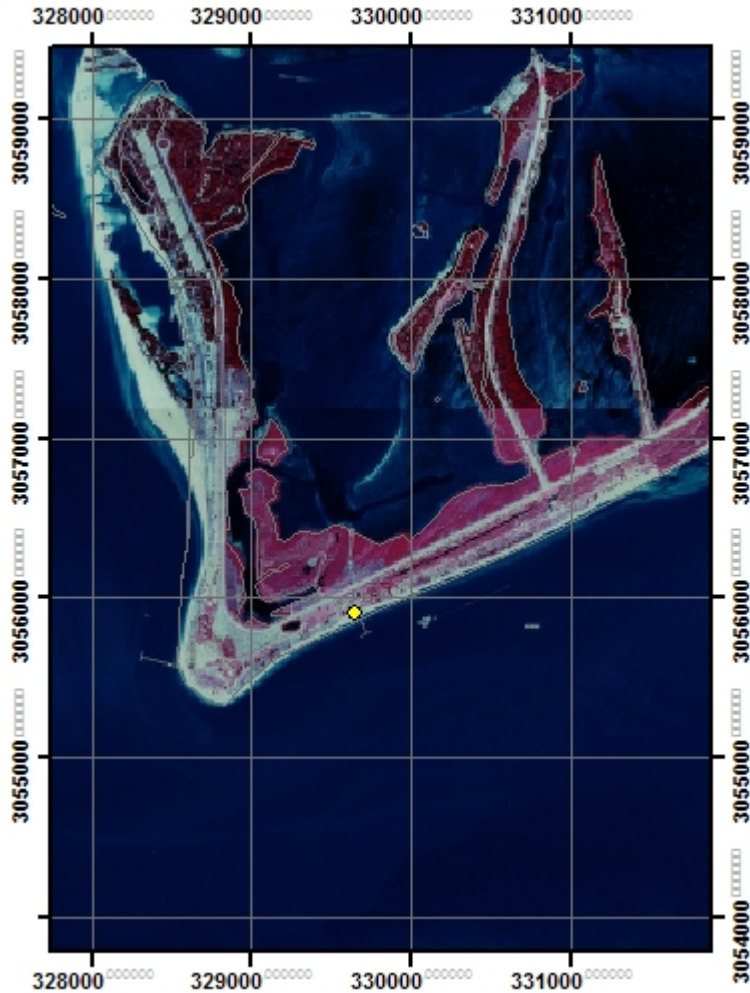
Occurrence 4: Pinellas Bayway

A large colony of over 500 plants of *H. debilis* subsp. *vestitus* is along the eastern shoulder of the Pinellas Bayway (SR 679) just north of Fort Desoto County Park.



Occurrence 5: Fort Desoto County Park

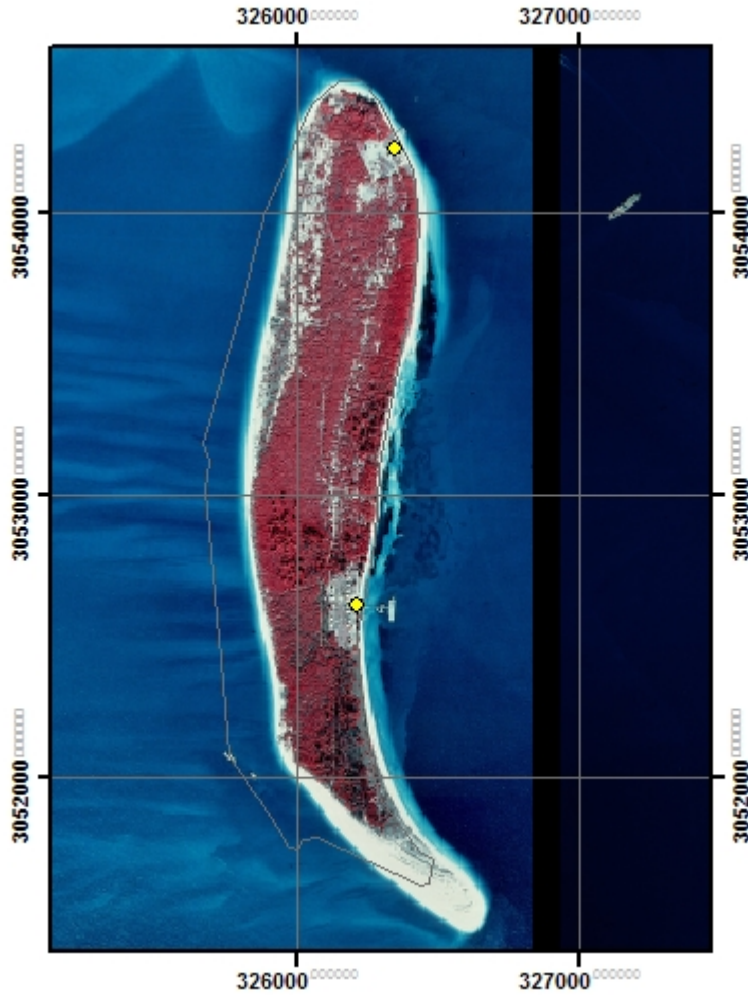
Only a single population of *H. debilis* subsp. *vestitus* was found at this park along the shoreline immediately adjacent to the pier on the south edge of the park. *H. debilis* subsp. *debilis*, or hybrids, were found to be abundant throughout the park, including the vicinity of the pier. These plants may have recruited from seed carried on baggage or clothing from the population at the pier on Egmont Key (Occurrence 6, below), as people travel between these two piers on a daily basis. *H. debilis* subsp. *vestitus* was also collected in this vicinity in 1955 by S. Earl and M. Waas (140, FLAS).



Occurrence 6: Egmont Key

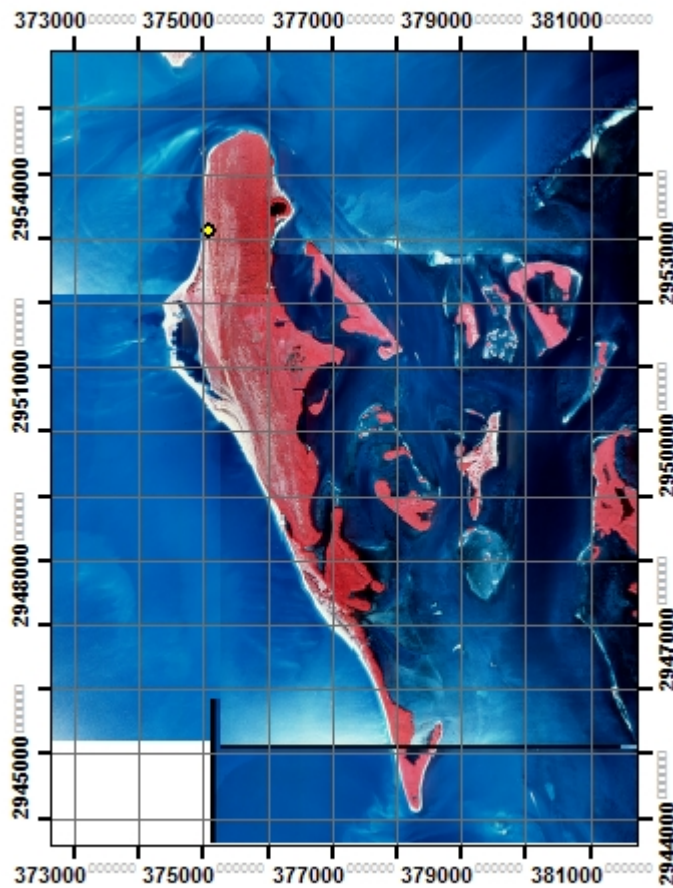
Egmont Key, most of which is a Florida State Park, contains two populations of *H. debilis* subsp. *vestitus*. One was observed at the island’s main pier in front of the pilot housing area. These plants grow in sand along the disturbed, often mowed coastline.

A second colony of about 25 plants was observed at the north end of the island in dunes opposite the lighthouse. The area where plants are growing had burned several years before.



Occurrence 7: Cayo Costa State Park

Cayo Costa Island, much of which is a Florida State Park, contains a single population of *H. debilis* subsp. *vestitus*. A small colony of *H. debilis* subsp. *vestitus*, fewer than 25 plants, is behind the dunes in coastal grasslands near the north end of the island. A colony of *H. debilis* subsp. *debilis* or hybrids was also found. The introduced colony was found at the extreme northern tip of the island. It was not reported previously from this island by Cooley (1955) or by Herwitz & Wunderlin (1990), so this may be a recently established population.



Acknowledgements

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Citations

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Figure 1: Survey Stations by The Institute for Regional Conservation

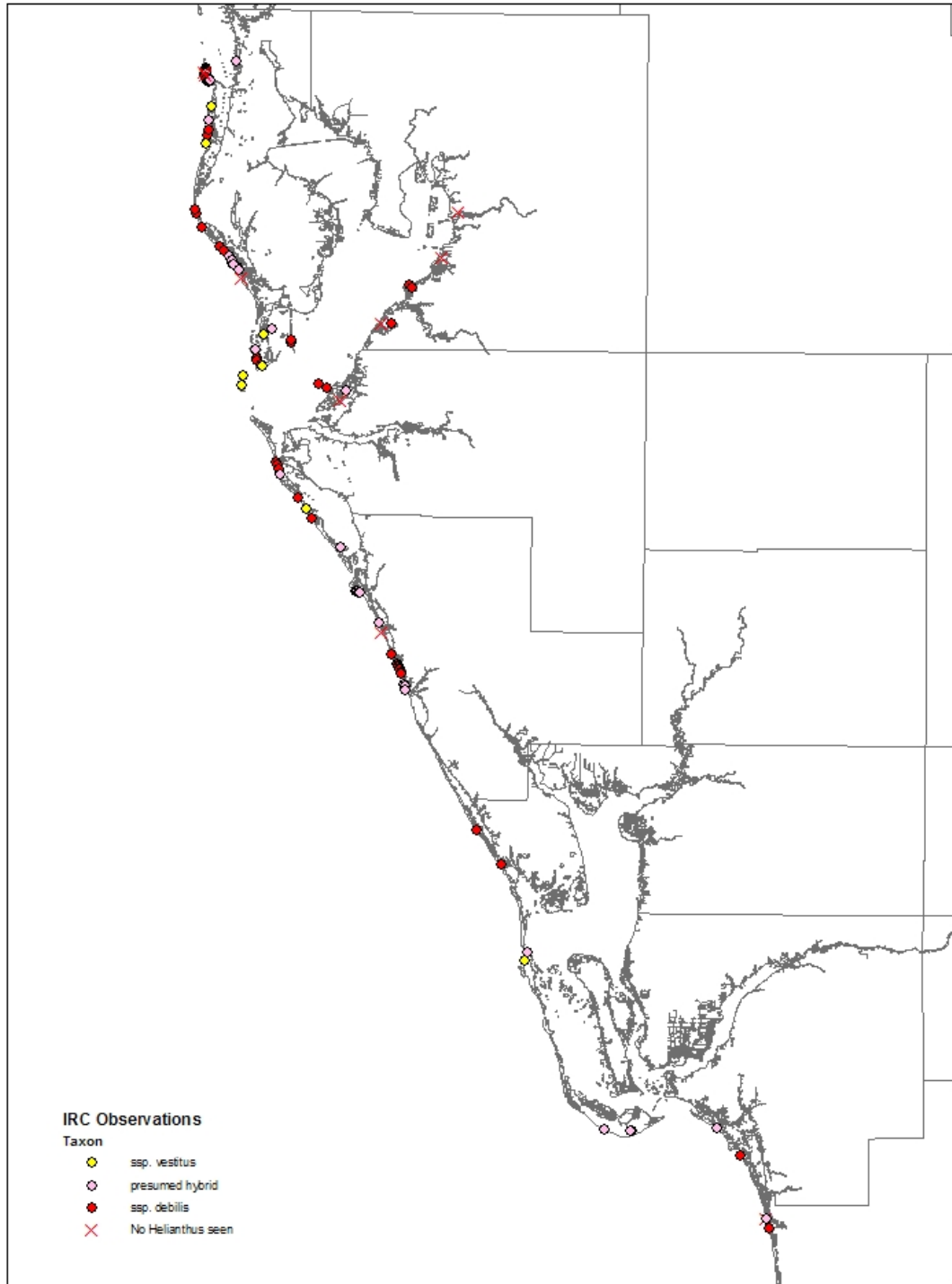


Figure 2: Dates of Herbarium Collections of *Helianthus debilis* subsp. *vestitus*

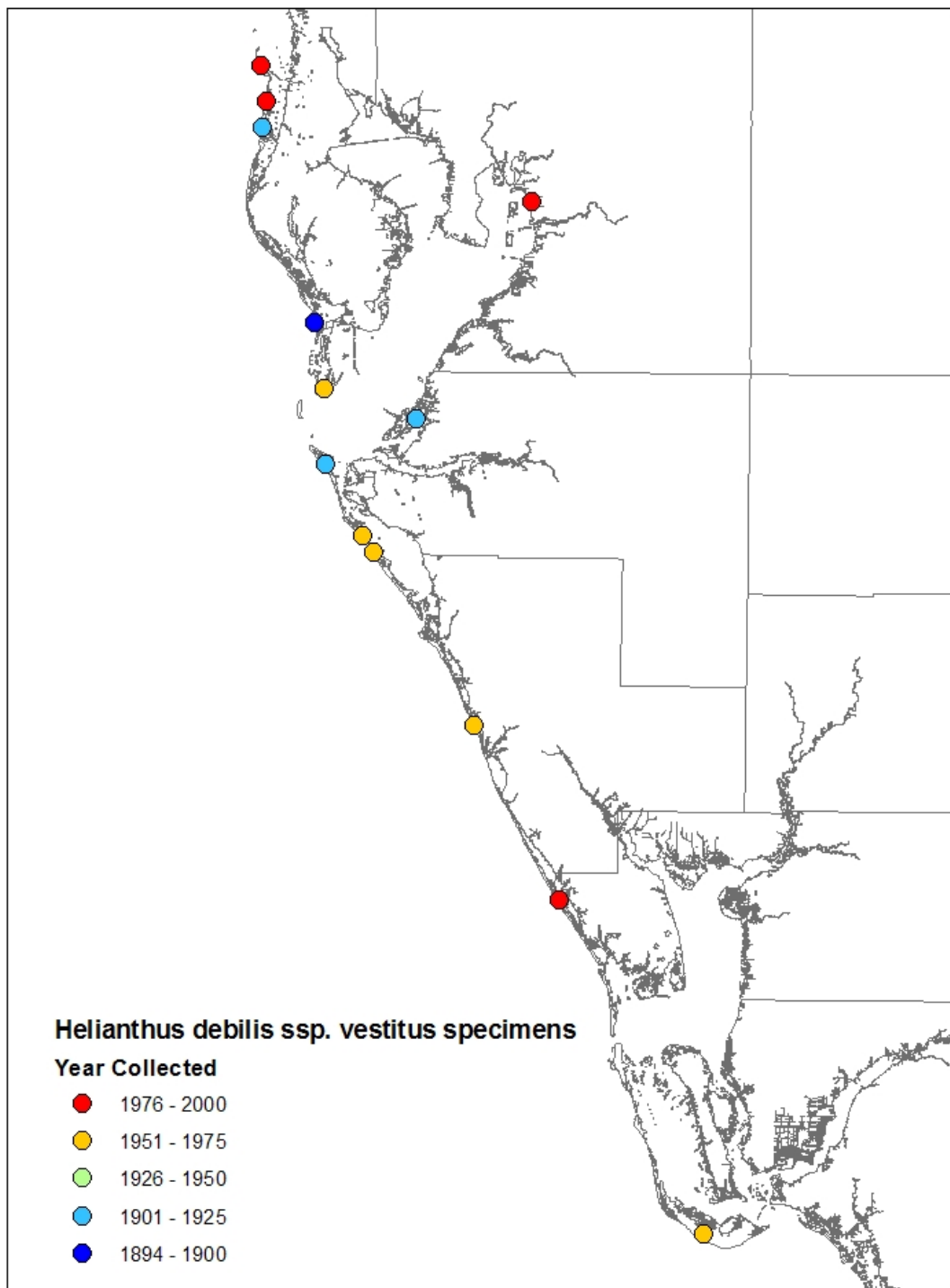


Table 1: Surveyed Sites

SiteName	County	Helianthus type
Anna Maria Island: 5th St. & Gulf Dr. South, Cortez Beach	Manatee	subsp. <i>debilis</i>
Anna Maria Island: Bradenton Beach, West end of 684 (Cortez Road)	Manatee	subsp. <i>debilis</i>
Anna Maria Island: Coquina Beach	Manatee	Hybrid
Apollo Beach Nature Preserve	Hillsborough	No <i>Helianthus</i> seen
Barefoot Beach Preserve Park	Collier	No <i>Helianthus</i> seen
Barefoot Beach Road: restoration planting	Collier	Hybrid
Caladesi Island State Park	Pinellas	subsp. <i>vestitus</i>
Casey Key: Nokomis beach at southern end of Casey Key, south of bridge	Sarasota	Hybrid
Casey Key: North Jetty Park at southern end of Casey Key	Sarasota	Hybrid
Casey Key: Private beach midway down Casey Key Road	Sarasota	subsp. <i>debilis</i>
Cayo Costa Island	Lee	subsp. <i>vestitus</i> and Hybrid
Clearwater Beach Island: along El Dorado Avenue, parallel to Clearwater public beach	Pinellas	Hybrid
Clearwater Beach Island: along Gulfview Road, next to public beach	Pinellas	subsp. <i>debilis</i>
Clearwater Beach Island: at Rockway Street	Pinellas	subsp. <i>debilis</i>
Cockroach Bay Aquatic Preserve	Hillsborough	No <i>Helianthus</i> seen
Cockroach Bay Nature Preserve	Hillsborough	subsp. <i>debilis</i>
Crystal Beach Park: Crystal Beach Ave & N. Gulf Drive	Pinellas	Hybrid
Delnor-Wiggins State Park	Collier	subsp. <i>debilis</i>
Don Pedro Island State Park	Charlotte	subsp. <i>debilis</i>
E.G. Simmons Park	Hillsborough	subsp. <i>debilis</i>
Egmont Key	Hillsborough	subsp. <i>vestitus</i>
Estero Island: Beach Access 15 at Sterling Ave.	Lee	Hybrid
Fort Desoto Park	Pinellas	subsp. <i>vestitus</i> , Hybrid, subsp. <i>debilis</i>
Honeymoon Island State Park: along roads	Pinellas	Hybrid and subsp. <i>debilis</i>
Indian Shores Beach	Pinellas	subsp. <i>debilis</i>
Little Hickory Beach Park	Lee	Hybrid
Longboat Key: Joan M. Durante Park, 5550 Gulf Drive	Manatee	subsp. <i>debilis</i>
Longboat Key: On driveway into Public Works, 280 Gulf Drive	Sarasota	Hybrid
Longboat Key: Quickpoint Nature Reserve, 100 Gulf Drive	Sarasota	Hybrid
Longboat Key: southern end of Longboat Key, just north of 3660 Gulf Drive	Sarasota	subsp. <i>debilis</i>
Lover's Key State Park	Lee	subsp. <i>debilis</i>
Madeira Beach: "Beach Vegetation Project" southern end	Pinellas	Hybrid
Madeira Beach: 152 Avenue	Pinellas	subsp. <i>debilis</i>
Madeira Beach: southern end, 138 Avenue	Pinellas	subsp. <i>debilis</i>
Madeira Bickel Mound	Manatee	Hybrid
Parallel to Skyway 275: Old bridge entrance road	Manatee	subsp. <i>debilis</i>
Redington Beach: 182 Avenue.	Pinellas	subsp. <i>debilis</i>
Road exiting Ft. Desoto Park. North of East Shores Blvd., east of Pinellas Bayway Rd.	Pinellas	subsp. <i>vestitus</i>

Road exiting Ft. Desoto Park. South of East Shores Blvd., east of Pinellas Bayway Rd.	Pinellas	subsp. <i>vestitus</i>
Sands Key Park: at same location as reported by FNAI MA	Pinellas	subsp. <i>vestitus</i>
Sands Key: on 198 Avenue near public beach	Pinellas	subsp. <i>debilis</i>
Sanibel Island: Beach Access at Mile 7	Lee	Hybrid
Sanibel Island: roadside	Lee	subsp. <i>debilis</i>
Sanibel Island: Sanibel-Captiva Conservation Foundation Tract	Lee	Hybrid
Shell Point Road	Hillsborough	No <i>Helianthus</i> seen
Side of Pinellas Bayway Rd.	Pinellas	subsp. <i>debilis</i>
Siesta Key: Blind Pass Road & Turtle Beach Road, near Turtle Beach	Sarasota	Hybrid
Siesta Key: Siesta Key beach	Sarasota	Hybrid
Siesta Key: Siesta Key beach along restored dune area, Beach Road	Sarasota	Hybrid
Skyway 275: heading north on turn-off	Hillsborough	subsp. <i>debilis</i>
Skyway 275: heading south	Pinellas	subsp. <i>debilis</i>
Skyway 275: heading south	Manatee	subsp. <i>debilis</i>
Stump Pass State Park	Charlotte	subsp. <i>debilis</i>
Terra Ceia Island: all roads and roadside areas	Manatee	No <i>Helianthus</i> seen
Treasure Island: 105 Ave.	Pinellas	Hybrid
Treasure Island: 121 Ave & Gulf Blvd.	Pinellas	Hybrid
Treasure Island: 123 Ave & 1st St.	Pinellas	subsp. <i>debilis</i>
Treasure Island: public access beach just south of pass heading south to Treasure Island, 127 Avenue & Gulf Blvd.	Pinellas	Hybrid
Treasure Island: Snowy Egret Lot, 126 Ave. & West 1st St.	Pinellas	subsp. <i>debilis</i>
Treasure Island: Sunset Beach, 88 Ave & West Guld Blvd.	Pinellas	No <i>Helianthus</i> seen
Treasure Island: Treasure Island Municipal Beach	Pinellas	subsp. <i>debilis</i>
Williams Park (off of Riverview Road)	Hillsborough	No <i>Helianthus</i> seen