Naturalized coconut (*Cocos nucifera*) and date (*Phoenix dactylifera*) palms, Dry Tortugas, Florida

DENNIS V. JOHNSON AND JANE C. MACKNIGHT

Abstract

A review of historical records, documents, photographs, and a 2025 field visit to Garden Key in the Dry Tortugas Archipelago, Florida, U. S. A. document that *Cocos nucifera* (coconut palm) and *Phoenix dactylifera* (date palm) have long histories on some of the islands of this archipelago. The history of introduction of the two palm species and their past, present, and projected future status are discussed and illustrated, adding to our knowledge of the naturalized range of both species.

Introduction

Coconut and date palms are globally important tree crops purportedly native to the Indo-Pacific region, and the Middle East and North Africa, respectively. Dispersed worldwide by natural processes and human action for plantation growth, home gardens, religious purposes, and as ornamental landscape subjects, the two palms have become widely naturalized where they may be known locally but not formally documented, especially on remote islands. The objective of this study was to investigate the Dry Tortugas islands of the Florida Keys, U. S. A. as part of the naturalized range of coconut and date palms. No herbarium collections of date or coconut palms were found for the Dry Tortugas; however, written accounts, notable botanical sight records, and photographs provide proof of the presence of historic palm populations. This information provides a background for the current status of the palms as determined from data in National Park Service reports and a field trip to Garden Key.

The Dry Tortugas

The Florida Keys (**Fig. 1**) constitute an archipelago of 1,700 low-lying, subtropical, coral islands sweeping south and west some 320 km (200 mi) from the southern tip of Florida, ending at a group of seven small keys known as the Dry Tortugas (24.6652° N 82.8554° W). Named for their sea turtle nesting grounds and lack of fresh surface water, the islands are positioned about 112 km (70 mi) west of Key West and stand out geographically as the most remote location in the

1. Map of Dry Tortugas Archipelago and their position relative to the Florida Keys and Florida, U. S. A. Map courtesy of and © 2026 by SWmaps.

continental United States. Maximum island elevations reach 3 m (10 ft). Underlain by a limestone substrate, island soils are shallow, highly alkaline, nutrient poor, and porous with limited capacity to hold fresh water. Native vegetation does not include y trees and is characterized by shrubby mangrove,other patchy low shrubs, and grasses (Luciani et al. 2011).

The Human Footprint

Juan Ponce de Leon's 1513 voyage to claim Florida for Spain included discovery of the Dry Tortugas. The island group has a complicated human history without ever having a permanent settlement. Activities over the three centuries following European discovery focused on sea turtle hunting, fishing expeditions, and piracy. After Florida became a United States territory in 1821, a lighthouse and Fort Jefferson were built on Garden Key. Over time, the key served as a prison during the U. S. Civil War, a quarantine hospital, and a navy coaling station. Damaged by fire and hurricanes, the Fort lay abandoned in the early 1900s until the 1935 creation of Fort Jefferson National Monument, which included all of Garden Key. At that time, the rest of the archipelago remained under the control of the U. S. Coast Guard. With the creation of Dry Tortugas National Park in 1992, expanded boundaries were delineated to include all seven islands with their surrounding coral reefs. The new protected area provided environmental services like a marine sanctuary and refuge flyway for migrating birds. Notably, John James Audubon visited the Dry

Tortugas in 1832 to study sea bird nesting. The archipelago is part of the Everglades and Dry Tortugas Biosphere Reserve as designated by UNESCO in 1976.

Loggerhead Key, named for the sea turtle, lies 5 km (3 mi) west of Garden Key. A lighthouse was erected in 1858. Also, the Carnegie Marine Biological Laboratory was in operation there from 1904 to 1939 for visiting scientists studying coral reefs and tropical marine biology.

To support construction and operation of the lighthouses and Fort Jefferson, living quarters for temporary construction workers, as well as lighthouse and fort personnel, were built on Garden and Loggerhead keys. Numerous exotic plants were introduced for vegetable gardens along with shade trees, which included buttonwoods, native to Florida, Australian pines (*Casuarina*), coconuts, and date palms. The lighthouses on Garden and Loggerhead keys were deactivated in 1924 and 2014, respectively.

Coconut and Date Palm Introductions

Details of the sequence and source of exotic plant introductions to the Dry Tortugas are unknown but accepted to have been initiated in large part during Fort Jefferson's construction, 1846–1876, and possibly earlier instances once Florida became a U. S. territory in 1821. The following accounts derive from: National Park Service (NPS) (NPS 2007), a comprehensive report on Garden Key's history by Hitchcock and Byrd (2011) and a follow-up landscape inventory by Byrd and Hasty (2022).

Mature coconuts were growing on the parade grounds of Fort Jefferson in 1856, according to a visitor who observed that the palms provided shade to the lighthouse keeper's residence (p. 48, Hitchcock and Byrd 2011). This information suggests that coconuts were growing on Garden Key as early as the late 1830s. Apparently, coconuts and dates were grown solely for shade. A soldier garrisoned at the Fort wrote in a letter of 1862 that coconuts bore fruit, but they never ripened because of the impoverished coral-derived soils (p. 49, Hitchcock and Byrd 2011). No references were found to either palm as a fruit source. A trusted 1867 summary of the plants growing on the parade ground (pp. 51–52, Hitchcock and Byrd 2011) identified a dozen or so exotic food, shade, and ornamental plants, including coconuts and dates. Numerous photographs of the Fort Jefferson parade ground since the mid-late 1800s include coconuts. An image from the 1870s (p. 53, Hitchcock and Byrd 2011) shows about ten mature coconuts towering over the small magazine on the parade ground. The palms appear to be 20 to 30 years of age. One account states that 30 coconut palms were present at the Fort in 1898 (p. 55, Hitchcock and Byrd 2011).

2. Dry Tortugas National Park. Fort Jefferson Parade Ground. Mature date palm front center, 1934 photo. Source: Hitchcock and Byrd 2011, public domain. Note: the palm no longer exists.

Initial documentation of the date palm on Garden Key came in 1867 (pp. 51–52, Hitchcock and Byrd 2011). Bowman (1918) inventoried the date palm, along with coconut, as growing on Garden Key. The earliest photographic record found is that of a mature date palm inside the Fort from 1934 (**Fig. 2**). Another view of the parade ground in 1937 reveals an apparently healthy mature date palm with several basal offshoots (p. 57, Hitchcock and Byrd 2011).

Sometime after the creation of Fort Jefferson National Monument in 1935, the NPS planted additional coconut palms (p. 176, Hitchcock and Byrd 2011). Base mapping of the Fort and its trees in 1939 counted 22 palms: 16 coconuts and 6 dates (p. 216, Hitchcock and Byrd 2011). (Note that a date palm with basal suckers is counted as a single palm as it has a shared root system.) The planting of more coconuts probably accounts for the results of an enumeration of palms on a later map from 2007, which recorded a total of 100 palms: 97 coconuts, but only 3 dates (p. 5, NPS 2007). Subsequently, hurricanes destroyed over 90 % of the coconut palms (p. 61, Hitchcock and Byrd 2011). Losses are reflected in the 2009 survey which found only 18 palms: 12 coconuts and 6 dates (p. 218, Hitchcock and Byrd 2011). The most recent NPS vegetation survey in 2022 registered 16 palms:13 coconuts and 3 dates (p. 13, Byrd and Hasty 2022).

3. Dry Tortugas National Park. Fort Jefferson Parade Ground. Very dense cluster of date palm offshoots at rear of the large powder magazine. Photo © 2025 by Jane C. MacKnight.

A field trip to Garden Key in December 2025, revealed a further decline in palms to 12 in all: 9 coconuts (including one recent volunteer seedling found on the beach facing the north coal dock) and 3 dates. A dense cluster of date palm offshoots (**Fig. 3**) is shown on the parade ground without evidence of inflorescences, possibly because the offshoots are immature. A single date palm surrounded by offshoots was recorded at that location in 2007, 2009, and 2022; only the offshoots survive. A single mature date and two coconuts are pictured in **Figure 4**; only a single date palm was mapped at that location in 1939, 2007, 2009, and 2022. A historic photo of four clustering mature date stems just outside the Fort appears in **Figure 5**; earlier photographs at that location show four mature and one immature date stems in the cluster. The 1939 map

4. Dry Tortugas National Park. Fort Jefferson Parade Ground. A vigorously suckering mature date palm to the right, two coconut palms to the left, near former engineers' quarters. Photo © 2025 by Jane C. MacKnight.

5. Dry Tortugas National Park. Fort Jefferson exterior beside the moat; cluster of four mature date palms. A coconut palm is visible in the background. When the photograph was taken is unknown. Source: iStock, Blue Barron Photo, uploaded 2019. Used with permission.

6. Loggerhead Key. Aerial view of the island shows numerous coconuts around the lighthouse. The view is southward. Source: U. S. Coast Guard photo, 1951.

7. Dry Tortugas National Park. Loggerhead Lighthouse. Coconut palms have naturalized on the island. Source: photo credit U. S. Coast Guard, 2005, Jennifer Johnson.

did not record a date palm at that location, but one was present in 2007, 2009, and 2022. In 2025, only a single leaning date palm survives.

On Loggerhead Key, 5 km (3 mi) west of Garden Key, coconuts were likely introduced during lighthouse construction in the 1850s. Millspaugh (1907) remarked that several coconut palms were present in the lighthouse enclosure. A 1951 photograph (**Fig. 6**) reveals a coconut garden north of the lighthouse and coconuts near the tower for a total of 65 to 70 specimens. A stand of about two dozen coconut palms is shown in 2005 (**Fig. 7**); in online images from the 2020s, coconut populations appear to be about the same or slightly larger. The naturalized coconuts on Loggerhead produce viable fruit as evident from the varying ages of the palms. Loggerhead Key was not visited.

Historically, three other landscape palm species once adorned Garden Key but no longer exist. Sight records of the Canary Island date palm (*Phoenix canariensis*) were reported in 1918 and again in 1942. The California fan palm (*Washingtonia filifera*) and a specimen of *Pritchardia* sp. were observed in 1961 (Stoddart and Fosberg 1981). None of the other islands of the Dry Tortugas are known to have palms, except for Bird Key, 1.5 km (0.9 mi) southwest of Garden Key, where Bowman (1918) observed well grown coconuts around a cottage and hospital. Bird Key in its entirety vanished during the massive 1935 hurricane which also destroyed the Key West railroad.

When Dry Tortugas National Park was demarcated in 1992, a key land management objective was to restore the islands to their natural vegetative cover and to reinstate natural habitats to protect the nesting grounds of endangered sea turtles and migrating birds. A successful program to remove most exotics was conducted, especially on Loggerhead Key. Throughout the park, trees of historical significance, such as buttonwood, coconut, and date, are preserved.

Conclusion

Coconuts and dates have been a continuous component of the landscape vegetation of Garden Key since the mid-1800s, with some replacement plantings of coconut in the 1900s. This study records the history of exotic palm growth on the Dry Tortugas and contributes to the scientific knowledge of the world geography of relict populations of coconut and date palms. Also, it highlights successful coconut growth on Loggerhead and Garden keys although reportedly on the latter fruits do not reach maturity. More so than coconuts, date palms appear to suffer environmental stress to the point of inhibiting flowering and fruiting. The three surviving date palms exhibit no evidence of old staminate or pistillate inflorescences, which is unusual. It would be of scientific interest to monitor the three date palms over an annual cycle or two to record

flowering activity. If it turns out that flowering is being suppressed, DNA analysis could determine if genetic modification has taken place due to the very harsh conditions.

NPS management planning for Dry Tortugas includes restoration of palms to historic levels on Garden Key. Based on previous populations, 40 to 50 coconuts and 6 to 8 dates would be appropriate. A coconut nursery could easily be created using seednuts from Loggerhead Key to repopulate the parade ground and exterior of the fort on Garden Key. The historic dates on Garden Key were grown from seed, and seed could be used for repopulation; however, faster results can be achieved by obtaining offshoots. Given the remoteness of the Dry Tortugas, the naturalized coconuts and dates are likely free of the common palm maladies found on mainland Florida. Sourcing of propagules should be very carefully executed to avoid inadvertent introductions of palm pests and pathogens. The Tortugas could then also function as a clean reserve of germplasm in the event of an epidemic seriously affecting the palms elsewhere.

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Dennis V. Johnson djohn37@aol.com and **Jane C. MacKnight** janecmack@gmail.com are consultants specializing in plant sciences.

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