

Short Note

Observations and Relocation of a West Indian Manatee (*Trichechus manatus*) off Bimini, The Bahamas

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West Indian manatees (*Trichechus manatus*) are listed as vulnerable (*IUCN Red List*, 7 March 2009; Deutsch et al., 2008), with the subspecies *Trichechus manatus latirostris* and *T. m. manatus* (Florida and Antillean, respectively) considered endangered (*IUCN Red List*, 21 January 2011; Deutsch, 2008; Self-Sullivan & Mignucci-Giannoni, 2008). Manatees are not native to The Bahamas; however, sightings have been recorded periodically since 1904, with an increase in sightings documented in the 1990s (Lefebvre et al., 2001). In the area of Bimini, The Bahamas, the first recorded manatee sighting was in 1904 of a single individual that was apparently killed (Allen, 1942). The second was not until 1996, which was poorly documented. The small adult remained for approximately 6 wks before disappearing (Lefebvre et al., 2001). In 1998, a third sighting was reported off Bimini of a single individual. Although the animal was seen for several weeks and was relatively habituated to human presence (Al Sweeting, Jr., pers. comm., 28 November 2008), no data were collected on this individual nor any photographs suitable for identification purposes.

Here we report on the regular sightings of a manatee near the Bimini Islands in The Bahamas during late 2008 and early 2009. Observations were made by the authors and members of the local community. On 28 November 2008, the manatee was observed swimming along the southwestern coast of North Bimini, The Bahamas. The individual cruised steadily, pausing at the entrance to the North Bimini harbor before visual contact was lost. Following this first sighting, the manatee was re-sighted regularly until 24 January 2009. During initial field observations, the manatee did not appear emaciated, entangled, or obviously injured, and it did not approach

human swimmers. Photographs suitable for identification purposes were collected by researchers from the Bimini Biological Field Station (BBFS) on 29 November after the animal was sighted at Sea Crest Marina (SCM) on the east (harbor) side of Bimini, and then followed to the west (ocean) side of the island. The animal's body showed scars from at least five independent boat strikes suggesting repeated interactions with watercraft. Analyses of photographs of this individual did not provide a match with manatees already documented in the Manatee Individual Photo-Identification System (Beck & Reid, 1995), which includes histories for individual manatees photographically documented in the U.S. and in limited areas of the Caribbean. The Bahamas Department of Marine Resources (BDMR) and the U.S. Fish & Wildlife Service (the Service) were contacted, and all future observations and interactions with the manatee were coordinated by these government agencies in addition to assistance from manatee research agencies in Florida.

During field observations on 15 December 2008, the manatee was confirmed to be a male and outfitted with an Argos-linked GPS tag by a snorkeler (JPR) while free-swimming; he was given the tracking-ID number TBH-02m. His length and weight were estimated at 300 cm and 544 kg, respectively; thus, he was assumed to be an adult. The animal did not appear lethargic or in distress, and his behavior was characterized as typical with regular breathing and resting patterns. In fact, his physical condition appeared normal throughout the subsequent 8-wk observation period. Fecal and tissue samples were also collected for analysis. Normal fecal composition and observations of foraging within abundant sea grass beds suggested the animal was not nutritionally compromised.

Continuous tracking data over 41 d after tagging showed TBH-02m repeatedly used the eastern coast of North Bimini and southwestern coast of South Bimini (Figure 1). These areas have abundant sea grass growth (*Thalassia testudinum*, *Syringodium filiforme*, and *Halodule wrightii*) in water deep enough (> 1 m) for a manatee to comfortably forage, and with ample deeper water or channels for travel. These areas contrast with the shallow (< 1 m) waters farther east of Bimini in which the manatee was not observed. TBH-02m frequented two specific sites at the northernmost end of North Bimini harbor across from a major resort development, as well as specific locations

in seagrass beds off South Bimini. The two North Bimini sites were visually assessed but provided no conclusive evidence to explain the animal's preference for these locations. Neither site had a greater amount of forage or difference in temperature than other sites in the area, nor was there an apparent source of fresh water. It is possible that these locations were preferred as resting and feeding areas due to appropriate depth and greater distance from major boat traffic as both sites were outside the main harbor channel and marinas. However, there were additional adjacent sites with similar depth and boat influence that were not preferred sites.

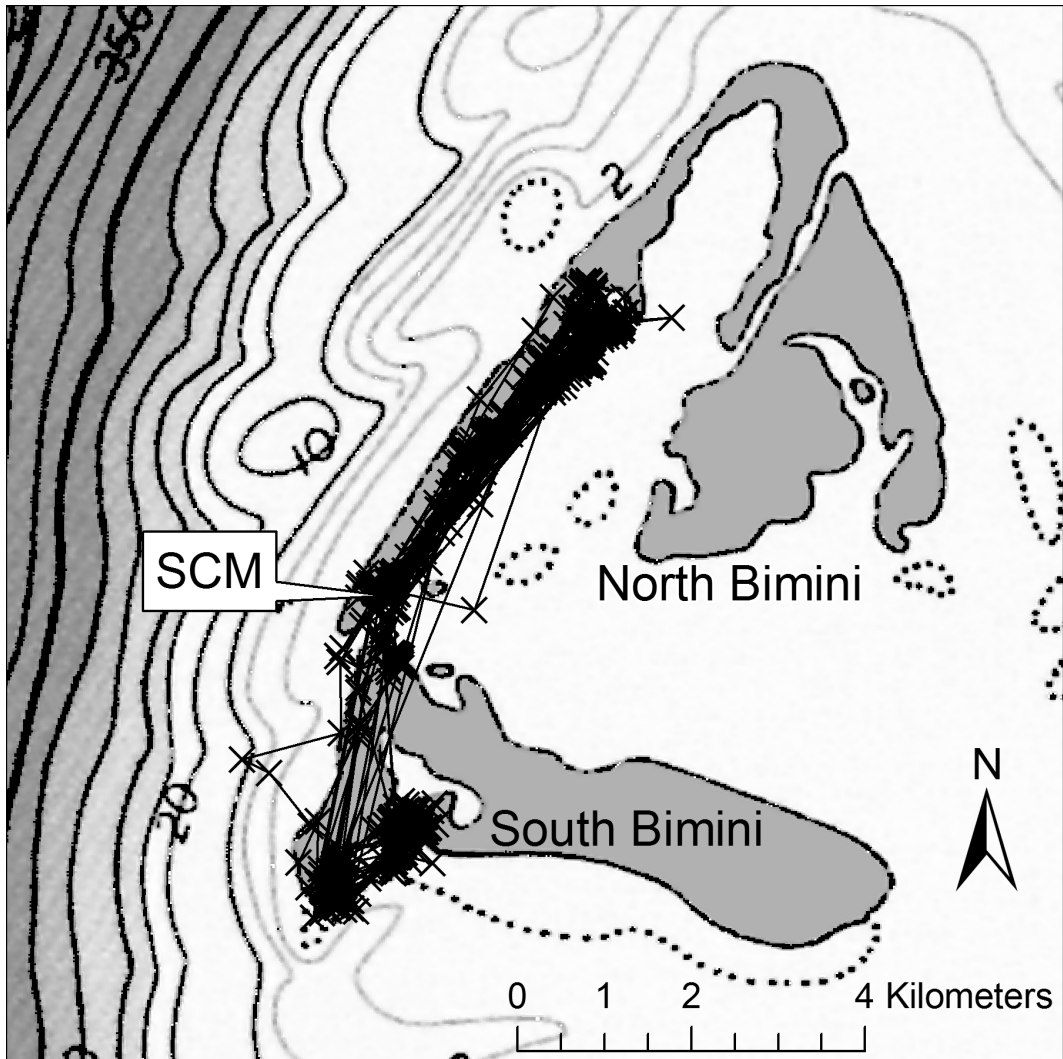


Figure 1. Satellite-determined location data (GPS) showing generalized use areas and repeated north-south movements of TBH-02m around North and South Bimini from 15 December 2008 through 24 January 2009; SCM refers to the location of Sea Crest Marina. Underlying map credit: NOAA

Manatees in marine habitats are known to seek out freshwater sources (Rathbun et al., 1990) and are believed to require fresh water for sustained health (Ortiz et al., 1998, 1999). Upon recommendation from the Service and in cooperation with BDMR, the manatee was offered potable fresh water from a hose during sightings at SCM to facilitate field observations and provide initial hydration should the manatee's health be compromised. Although the manatee was offered fresh water more than a dozen times during the observation period, it drank on only two occasions, for a total of less than 2 min. There was only a single report of TBH-02m taking potable hose water from a resident elsewhere on Bimini, and this drinking bout was also very brief. However, while at SCM, the manatee repeatedly oriented its head to a site at the base of a bulkhead sea wall in a manner suggestive of resource accessing. Although this area was investigated visually multiple times as a source for fresh water, none was found. It was suggested that this site could have been intermittently leaching fresh water from either natural (ground water) or anthropogenic (adjacent hotel) sources; therefore, it could not definitively be ruled out as a freshwater source. At no point did the manatee go more than 3 d without visiting this location. Tracking data showed repeated use of a more northerly marina that may also have been an intermittent source of anthropogenic fresh water; likewise, this could not be confirmed in the field or by local marina staff.

Although not matched to known individuals previously recorded in Florida or The Bahamas, it was considered likely that this manatee was a waif from Florida based on known and hypothesized manatee movements and ocean currents (Odell et al., 1978; Lefebvre et al., 2001), evidence of multiple boat strikes typical for manatees in Florida, and preliminary genetic findings suggesting a Florida origin. Genetic analysis indicated TBH-02m had the 410 bp A-haplotype, which is found in all Florida manatees and 31% of manatees sampled in Puerto Rico (Robert Bonde, pers. comm., 2009). Beginning in early December, discussions were ongoing between BDMR and the Service regarding possible intervention on behalf of this wayward individual. Concerns related to the manatee's frequent presence at marinas, the high volume of local vessel traffic, the lack of a local manatee rescue team, and the remoteness of Bimini to other manatee populations were discussed. Ultimately, concerns for his welfare in the form of the lack of a known, natural freshwater source and absence of nearby conspecifics were factors that led to the decision to attempt a capture and transport to Florida waters.

Extensive coordination among BDMR, Dolphin Communication Project Bimini field staff, the Service, the U.S. Coast Guard (USCG), Miami Seaquarium (MSQ), and the U.S. Geological Survey (USGS) Sirenia Project resulted in a rescue plan. On 24 January 2009, a manatee rescue team from the MSQ in Miami, Florida, was escorted to Bimini aboard the USCG cutter, *Kodiak Island*. A team of local volunteers gathered and was apprised of the capture process. A representative from BDMR was present to observe and facilitate logistics. The manatee was located by radio tracking later that day and subsequently net captured along the west shore of South Bimini. After a preliminary assessment by the MSQ veterinarian, TBH-02m was loaded by stretcher onto a local boat that transported the animal to the USCG cutter waiting offshore, which transported the manatee to Miami.

Initial blood analysis (e.g., total protein, blood urea nitrogen, creatinine, sodium, chloride, and packed cell volume) and stool consistency showed no noteworthy dehydration, suggesting the animal may indeed have utilized an adequate freshwater source in Bimini. The manatee remained quarantined at the MSQ's rehabilitation center until mid-February when it was medically cleared for release.

On 19 March 2009, after coordination with the Service and Florida rehabilitation and rescue partners, MSQ released TBH-02m in Crystal River, Florida. Although this individual had not previously been photo-documented in Florida, Crystal River was chosen as a release site because it is well-documented as an over-wintering site for Florida manatees and has a stable, freshwater source. The Crystal River is also easily navigable with abundant forage in adjacent sea grass beds, thereby providing good habitat in the event that this manatee was unfamiliar with the area. He was again outfitted with an Argos-linked GPS tag by USGS to monitor his initial movements. Preliminary tracking data showed direct moves to and use of known manatee sites, suggesting he may have been familiar with this portion of Florida's Gulf coast, or he followed other individuals and adapted to local manatee habitats.

Despite no verified freshwater site, in this particular case, the apparent good condition of TBH-02m suggests some manatees may be capable of surviving in Bimini, The Bahamas. It is unknown if TBH-02m's apparent ability to thrive in Bimini resulted from his successful access to fresh water at SCM, his use of an undiscovered freshwater source elsewhere in Bimini, or his tolerance to a lack of a consistent freshwater source. Although it is inconclusive as to what the fate of TBH-02m would have been had he remained in Bimini, the cooperative decision between the U.S. and The Bahamas' natural resource agencies to relocate

him to Florida was based on the best available field information and animal welfare concerns.

Although uncommon, manatees have been observed at several island groups in The Bahamas in recent years, including Grand Bahama Island, The Abacos, Berry Islands, Andros, Rum Cay, and Eleuthera, with most sightings consisting of single individuals (Lefebvre et al., 2001; J. P. Reid, pers. obs.; Bahamas Marine Mammal Stranding Network, pers. comm., 2009). Several of these manatees were identified by scar patterns as known individuals from Florida, with circumstances strongly suggesting they were waifs and likely incapable of returning to their Florida range (Lefebvre et al., 2001; Bahamas Marine Mammal Stranding Network, pers. comm., 2009). The true number of Florida manatees encountering the Gulf Stream may never be known given the likelihood of such individuals missing The Bahamas and disappearing northward (Odell et al., 1978). With both subspecies (Florida and Antillean) listed as endangered, documenting the specifics of rare waif animals in The Bahamas and the Caribbean is of great value to our understanding of the evolving biogeography of sirenians. Each new occurrence of individuals outside their normal range must be fully evaluated as to management and animal welfare needs. The utilization of well-established monitoring, radio tracking, and genetic sampling methodologies are valuable components of this inquiry. Communication, particularly between isolated areas such as Bahamian out-islands, via public education, stranding networks, and sirenian experts is vital to documenting long-term trends in manatee movements, habitat use, health, and ultimately their conservation in areas at the limits of their range. This incident is a successful case of clear and open communication and action among government agencies, private business, and citizens across nations.

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