Biological Resources	
34	In Resource Report 3 page 3-5, Table 3-2 lists typical vegetation found along the pipeline corridor. Please provide a complete list of vegetation (in addition to species mentioned in the resource report) observed at the onshore portions of the preferred and alternative pipeline routes during the field surveys.
Response	Table 3.2 has been revised to provide a listing of vegetation documented along the pipeline corridor including wetland areas. Detailed wetland and vegetation surveys of Alternatives B and C were not performed. However, much of the alternative routes are the same and the areas where they differ, either cross through grassy field on Port Manatee (Alternative B) or through a mangrove area, fields, RR easement, and commercial areas (Alternative C). It is expected that the list below provides a representative list of species present.

Table 3.2 Typical vegetation found along the pipeline corridor

Scientific Name	Common Name
Andropogon sp.	Bluestem species
Andropogon glomeratus	Bushy bluestem
Avicennia germinans	Black mangrove
Baccharis halimifolia	Sea myrtle
Bidens sp.	Beggar tick
Blechnum serrulatum	Swamp fern
Cyperus sp.	Flatsedge species
Eupatorium capillifolium	Dog fennel
Hydrocotyle umbellata	Marsh pennywort
Juncus sp.	Needle rush
Laguncularia racemosa	White mangrove
Ludwigia peruviana	Primrose willow
Myrica cerifera	Wax myrtle
Nephrolepis cordifolia	Erect sword fern
Panicum sp.	Panicum grasses
Panicum repens	Torpedo grass
Paspalum notatum	Bahia grass
Paspalum urvillei	Vassey's grass
Polygonum hydropiperoides	Swamp smartweed
Pontederia cordata	Pickerelweed
Pteris tripartita	Giant brake fern
Ricinus communis	Castor bean
Sabal palmetto	Cabbage palm
Sagittaria latifolia	Arrowhead
Salix caroliniana	Carolina willow
Schinus terebinthifolius	Brazilian pepper
Senna pendula	Climbing cassia
Suaeda linearis	Sea blite
Thelypteris interrupta	Hottentot fern
Typha sp.	Cattail
Urena lobata	Caesarweed
Vitis sp.	Grape vine species
	Unidentified grasses

Biological Resources	
35	In Resource Report 3, page 3-3, Table 3-1 lists wildlife species representative of the pipeline corridor. Please provide a complete a list of wildlife (in addition to species mentioned in the resource report) observed at the onshore portions of the preferred and alternative routes during the field surveys.
Response	During the field surveys, no wildlife was observed along the pipeline corridor. The species list provided includes wildlife species observed in Manatee County whose habitat type is present in the pipeline corridor.

Project Description and Alternatives	
36	Were red mangroves observed on the onshore portions of the alternative pipeline routes?
Response	Red mangroves were not observed in Wetland 1 that both the preferred route and Route B pass through. A detailed vegetation survey was not performed for Alternative Route C along the shoreline. Black mangroves were observed along the corridor away from the shoreline. Red mangroves are present along the shoreline in Terra Ceia, which is adjacent to the landing location for Route C and therefore, most likely red mangroves are present at that landing location.

Biological Resources	
37	Is there a reason for not considering the bald eagle in the terrestrial threatened and endangered species list?
Response	Yes, because although the bald eagle has been observed in Manatee County according to FNAI, the habitat requirements are not present along the Port Dolphin pipeline corridor. Bald eagles nesting habitats typically consists of older, taller trees with unimpeded view of the surrounding area and high water-to-land edge where prey is concentrated (Rogers, et al., 1996). The landing location at Port Manatee where the high water-to-land edge is present is highly developed industrial land use with no older, taller trees present.

Biological Resources	
38	Is there a reason for not considering the Florida mouse in the terrestrial threatened and endangered species list?
Response	The Florida mouse is a State species of special concern that has been observed in Manatee county. There is the potential for encountering the Florida mouse; however, it is not likely since the main habitat types of fire-maintained, xeric, upland vegetation occurring on deep, well-drained sandy soils, including sand pine scrub, coastal scrub, scrubby flatwoods, longleaf pine-turkey oak (sandhill), upland hammock, live oak (xeric) hammock, and drier pine flatwoods are not present (http://Natureserv.org).

Biological Resources	
39	Please provide a list of potential threatened and endangered plant species for the alternative pipeline routes.
Response	Below is a listing of potential threatened and endangered plant species present in Manatee County, Florida.

Potential Threatened and Endangered Plant Species

Scientific Name	Common Name	Federal Status	State Status	Habitat
Acrostichum aureum	Golden Leather Fern		T	Mangrove habitats and other wetlands
Bigelowia nuttallii	Nuttall's Rayless Goldenrod		E	Dry habitats to wet savannas or seepage slopes, often over sand or sandy-loam
Bonamia grandiflora	Florida Bonamia	T	E	Openings or disturbed areas in white sand scrub on central Florida ridges, with scrub oaks, sand pine, and lichens.
Calopogon multiflorus	Many-flowered Grass-pink		E	Dry to moist flatwoods with longleaf pine, wiregrass, saw palmetto.
Centrosema arenicola	Sand Butterfly Pea		E	Sandhills and scrubs temperate forests
Chrysopsis floridana	Florida Goldenaster	E	E	Sunny, bare patches of sand in sand pine scrub; low sand ridges of excessively well drained, fine sands; railroad and highway rights-of-way.
Eragrostis pectinacea var. tracyi	Sanibel Lovegrass		E	Dunes, sandy substrate, upland habitats
Glandularia tampensis	Tampa Vervain		E	Live oak–cabbage palm hammocks and pine–palmetto flatwoods; disturbed, sandy areas.

Potential Threatened and Endangered Plant Species

Scientific Name	Common Name	Federal Status	State Status	Habitat
Gossypium hirsutum	Wild Cotton		E	Disturbed areas such as along roads and on river overflow areas; well-drained soils; open, sunny areas
Lechea cernua	Nodding Pinweed		T	Scrub habitat
Linum carteria var. smallii	Carter's Large-flowerd Flax		E	Pinelands
Matelea floridana	Florida Spiny-pod		E	Upland; sandhill habitat;scrub
Nemastylis floridana	Celestial Lily		E	Wet flatwoods, prairies, marshes, cabbage palm hammocks edges
Nolina atopocarpa	Florida Beargrass		T	Pine flatwoods; open scrub to hammocks with closed canopies
Pteroglossaspis ecristata	Giant Orchid		T	Sandhill, scrub, pine flatwoods, pine rocklands
Zephyranthes simpsonii	Rain Lily		T	Highly organic sands of wet pine flatwoods, meadows, pastures, roadsides, and glade borders

Source: Florida Natural Areas Inventory

Biological Resources	
40	Please provide details for the gopher tortoise relocation mitigation plan (including permitting process).
Response	During the preliminary wetland delineation surveys, no gopher tortoise burrows were identified. A formal jurisdictional wetland survey and determination will be performed, again looking for gopher tortoise burrows. Prior to construction initiation, another gopher tortoise survey will be performed to identify any tortoises that are present. In the unlikely event that a gopher tortoise and/or borrow is observed and cannot be avoided by more than 25 feet, a gopher tortoise permit for on-site relocation will be obtained from FWC. This will allow for the relocation of up to five tortoises to be relocated out of harms way on site. A permit is not needed if the construction activities are more than 25 feet away from the entrance to a burrow. The specifics of the permitting process are available at: http://www.floridaconservation.org/permits/Tortoise/default.asp

Biological Resources	
41	Please provide a table (similar to Table 3-4 in Resource Report 3) for the wetlands located along the onshore portion of the pipeline alternative routes.
Response	Much of the pipeline routes for the alternative pipeline routes (Alternative B and C) are the same as for the preferred route. Jurisdictional wetland determinations were not performed on the alternate routes. However, field surveys, FLUCCS and NWI mapping, and examination of aerial photographs of the areas were used to prepare the following tables.

Table 3-4a. Wetlands Located Along the Preferred Port Dolphin Pipeline Corridor (Alternative A)

Wetland	NWI Code	NWI Classification Type	Feet Marker "FM"	Length of Crossing (feet)
W-1	ESS	Estuarine Scrub Shrub	220,805.51 - 221,655.94	850.43
W-2	PEM	Freshwater Emergent Wetland	232,453.19 - 232,923.54	470.34
W-3	PEM/SS	Freshwater Emergent Wetland/Scrub Shrub	236,642.24 - 236,837.23	195.00
W-4	PEM	Freshwater Emergent Wetland	239,361.00 - 239,835.55	474.56
W-5	PSS	Freshwater Scrub Shrub	239,361.00 - 239,721.85	360.85
W-6	PEM	Freshwater Emergent Wetland	240,803.74 - 241,255.49	451.75
W-7	PEM	Freshwater Emergent Wetland	242,227.39 - 242,576.33	348.94
W-8	PEM	Freshwater Emergent Wetland	242,949.96 - 243,348.19	408.23
W-9	PSS	Freshwater Scrub Shrub	243,020.40 - 243,297.53	277.13
W-10	PSS	Freshwater Scrub Shrub	243,387.42 - 244,834.00	1446.58
W-11	PSS	Freshwater Scrub Shrub	247,141.89 - 247,487.59	345.70
W-12	PSS/EM	Freshwater Scrub Shrub/Emergent Wetland	247,943.68 - 248,258.76	315.08

Table 3-4b. Wetlands located along Alternative Route B pipeline corridor

Wetland	NWI Code	NWI Classification Type	Length of Crossing (feet)
W-1	ESS	Estuarine Scrub Shrub	1150.00
W-2	PEM	Freshwater Emergent Wetland	470.34
W-3	PEM/SS	Freshwater Emergent Wetland/Scrub Shrub	195.00
W-4	PEM	Freshwater Emergent Wetland	474.56
W-5	PSS	Freshwater Scrub Shrub	360.85
W-6	PEM	Freshwater Emergent Wetland	451.75
W-7	PEM	Freshwater Emergent Wetland	348.94
W-8	PEM	Freshwater Emergent Wetland	408.23
W-9	PSS	Freshwater Scrub Shrub	277.13
W-10	PSS	Freshwater Scrub Shrub	1446.58
W-11	PSS	Freshwater Scrub Shrub	345.70
W-12	PSS/EM	Freshwater Scrub Shrub/Emergent Wetland	315.08

Table 3-4c. Wetlands located along Alternative Route C pipeline corridor

Wetland	NWI Code	NWI Classification Type	Length of Crossing (feet)
W-1	ESS	Estuarine Scrub Shrub	1040.00
W-2	EEM/ESS	Estuarine Emergent Wetland/Estuarine Scrub Shrub	3458.00
W-3	EFO/SS	Estuarine Forested Wetland/Scrub Shrub	1326.00
W-4	PSS	Freshwater Scrub Shrub	455.00
W-5	PEM	Freshwater Emergent Wetland	470.34
W-6	PEM/SS	Freshwater Emergent Wetland/Scrub Shrub	195.00
W-7	PEM	Freshwater Emergent Wetland	474.56
W-8	PSS	Freshwater Scrub Shrub	360.85
W-9	PEM	Freshwater Emergent Wetland	451.75
W-10	PEM	Freshwater Emergent Wetland	348.94
W-11	PEM	Freshwater Emergent Wetland	408.23
W-12	PSS	Freshwater Scrub Shrub	277.13
W-13	PSS	Freshwater Scrub Shrub	1446.58
W-14	PSS	Freshwater Scrub Shrub	345.70
W-15	PSS/EM	Freshwater Scrub Shrub/Emergent Wetland	315.08

Biological Resources	
42	Please provide information of the potential for sea turtle hatchling to become entrained/impinged at the intake structures. Note, the Application addresses the ability of juvenile and adult turtles to escape the seawater intake, but does not address potential impacts on hatchling sea turtles.
Response	Due to the location and low velocity of the seawater intake, entrainment or impingement of sea turtle hatchlings is highly unlikely. The two intakes will be located 14.8 ft and 24.6 ft (4.5 m and 7.5 m) below the water line of a fully loaded vessel. Hatchling sea turtles typically are found among sargassum and debris at the sea surface during their pelagic stage (Carr, 1986a,b) and are therefore unlikely to encounter the submerged intake structure. Also, the swimming speed of hatchling sea turtles is greater than the intake velocity of 0.5 ft/s. According to Wyneken (2000), average swimming speeds for sea turtle hatchlings are 1.43 ft/s (0.44 m/s) for green turtles, 1.17 ft/s (0.36 m/s) for loggerhead turtles, and 0.83 ft/s (0.25 m/s) for leatherback turtles. Pilcher and Enderby (2001) report a slightly higher average swimming speed of 2.05 ft/s (0.62 m/s) for green turtles. The low intake velocity should allow sea turtle hatchlings that encounter the intake structure to escape entrainment or impingement. REFERENCES: Carr, A.F., Jr. 1986a. Rips, FADS and little loggerheads. Bioscience 36:92-100. Carr, A.F., Jr. 1986b. New perspectives on the pelagic stage of sea turtle development. NOAA Tech. Memo. NMFS-SEFC-190. 36 pp. Pilcher, N.J. and S. Enderby. 2001. Effects of prolonged retention in hatcheries on green turtle (*Chelonia mydas*) hatchling swimming speed and survival. J. Herpetol. 35:633-638. Wyneken, J. 2000. The migratory behavior of hatchling sea turtles beyond the beach, pp. 121-129. In: N. Pilcher and G. Ismail (eds.), Sea Turtles of the Indo-Pacific. ASEAN Academic Press. 361 pp.

Project Description and Alternatives	
43	Please provide information on the noise associated with Horizontal Directional Drilling (both onshore and in coastal areas). Please include the duration of the noise. Note that high noise levels can mask manatee communication signals and prevent acoustic localization, therefore increasing the risk of collisions with vessels in shallow water areas.
Response	The noise from HDD operations, both onshore and offshore, is primarily from the diesel engines that power the drilling and pull-in winches. These operations have a relatively small foot print and in past operations, the noise (and light) abatement has been accomplished by encapsulating the operation in temporary tents and canvass or constructing a sound absorption barrier. Should some type of encapsulation be necessary during the spring and summer months, Port Dolphin's contractor will be required to provide adequate ventilation equipment to ensure the health of the operating crews and the efficient operation of the machinery. The HDD's may take between 3 to 4 weeks each to accomplish, during which the equipment would be running most of the time. However, the noise near the HDD drilling equipment is normally within 88dB, which is a decibel level where ear protection is not required as defined by OSHA rules and regulations. Port Dolphin anticipates that the noise generated by both onshore and offshore HDD operations will be less that that caused by ongoing large bulk carrier ships that traverse the shipping lanes in the same area of the planned HDD's. Further, Port Dolphin will have a fulltime manatee watch during construction of the pipeline and will cease all operations when a manatee is sighted in the vicinity of the HDD's. It should also be recognized that most of the noise generated by the HDD operations is above the surface of the water (either on land or on a fixed jack-up vessel) and therefore noise generated by HDD operations would have to travel down the legs of the jack-up into the water, which would quickly dissipate and would have a minimal effect on manatees.

Biological Resources	
44	Please provide seasonal manatee density calculations in the project area. During winter months, large numbers of manatees congregate at power plant outfalls adjacent to the project area including: Bartow and Big Bend Power Plants, located in Pinellas and Hillsborough Counties respectively. Manatees using power plants in Tampa Bay forage in grassbeds around the Bay (Laist and Reynolds 2005).
Response	Accurate population estimates of the Florida manatee are difficult and counts can vary significantly from year to year. The only known quantitative manatee sightings data for the Tampa Bay region are derived from historical aerial survey data collected on a fairly regularly basis between 1988 and 1997 (Florida Fish and Wildlife, 2000). Although some gaps in regularly scheduled surveys exist, this dataset reasonably depicts manatee distributions and spatial concentrations within the Tampa Bay. It is assumed that factors such as weather and oceanographic conditions, visibility, and submerged animals add a degree of uncertainly to the sighting count. **Figures 1a and 1b** provides a summary of manatee sightings over the eleven year sampling period for the lower portion of the Tampa Bay in the nearest vicinity to the Port Dolphin project. In **Figure 1a**, summer season distributions are represented by the months April to November, while December to March are referred to as the winter season distributions (**Figure 1b**). For all years, a total of 377 manatee sightings (36.5%) were logged for the season referred to here as winter, and 1,032 (63.5%) for the summer season, for a total of 1,409 observations. The observed manatee count is fairly consistent in its range for all years except for the first year of sampling in1988. Here, the high manatee count seen in the summer season is a function of conducting twice as many aerial surveys as was done during all other years. In the summer of 1988, there were 14 aerial surveys, whereas, the average without this outlier for the summer season is 5.2 surveys/yr, and for winter is 5.3 surveys/yr. If we don't include data counts for the summer of 1988, then the average number of manatees observed in the lower Tampa Bay between 1988 and 1997 in the summer months is 78.1 manatees and 41.9 manatees in the winter, representing a 53.6% increase in sightings during summer season. To make sense of the significance of the spatial and temporal variability of manatees within the lower Tampa Bay, sightings data were mapped by year and season (**Attachment 1 - Figures 1 to 18**). Based on these figures, some obvious trends in the distribution of manatees in the lower Tampa Bay were noted: • There are many more manatee sightings in the summer than winter months. • No manatees were sighted in the deeper, central portion of Tampa Bay and shipping channels during either season. • All observed manatees congregate along shorelines in the shallowest regions of Tampa Bay. • The highest concentration of manatee observations lies within Anna Maria Sound, the Manatee River, Miguel Bay, and Bishop Harbor. • A few manatees congregate near Mullet Key, the pilings leading to the Sunshine Skyway Bridge, and near the shoals around Port Manatee. • Patterns between years and seasons show that the spatial distribution and concentrations of manatees remain fairly consistent and are reasonably predictable.

The 53.6% increase in summer sightings is most likely related to the fact that, during winter, manatees migrate to areas of warmer waters such as fresh water springs and power plant outfalls. Studies have found that some manatees have become so reliant on this source of artificial heat that they have ceased migrating south to warmer waters (Wikipedia, 2007).

Within Tampa Bay, in the warmer months, the higher concentration of manatees occurs around the shallowest pockets of each waterway. Manatees heavily rely on seagrass beds as an important food source and analysis of mapped seagrasses in the lower Tampa Bay consequentially coincides with these shallow, warm areas where manatee sightings are most dense (**Figure 2**).

The graphic presentation of seasonal manatee sightings in the project area for over ten years acts as validation that almost no manatees were spotted in the area surrounding the proposed Port Dolphin route. A few manatee sightings did occur in the vicinity of Port Manatee and near Passage Key (near the mouth of Tampa Bay), yet these were all recorded in very shallow water depths, not close to the boating channels (See Figures 1 and Figure12 for examples). Manatees recorded near Passage Key accounts for 0.6% of the total number of individuals observed over the eleven year period. Only 2.8% of all sightings were logged in the vicinity of Port Manatee, including the spoil area to the south. All of these animals were identified in water that is 1-2 ft deep, and away from the shipping channels. Based on this analysis, activities related to Port Dolphin are not expected to alter observed manatee density patterns in any way.

REFERENCES

Florida Fish and Wildlife. 2006. http://www.floridamarine.org/, Accessed, 8/30/2007.

Fish and Wildlife Conservation Commission, Florida Marine Research Institute. 2000. Atlas of Marine Resources CDROM, R.O. Flamm, L.I. Ward, M. White, eds., Version 1.3.

Manatees, http://en.wikipedia.org/wiki/Manatee, Accessed, 8/30/2007.

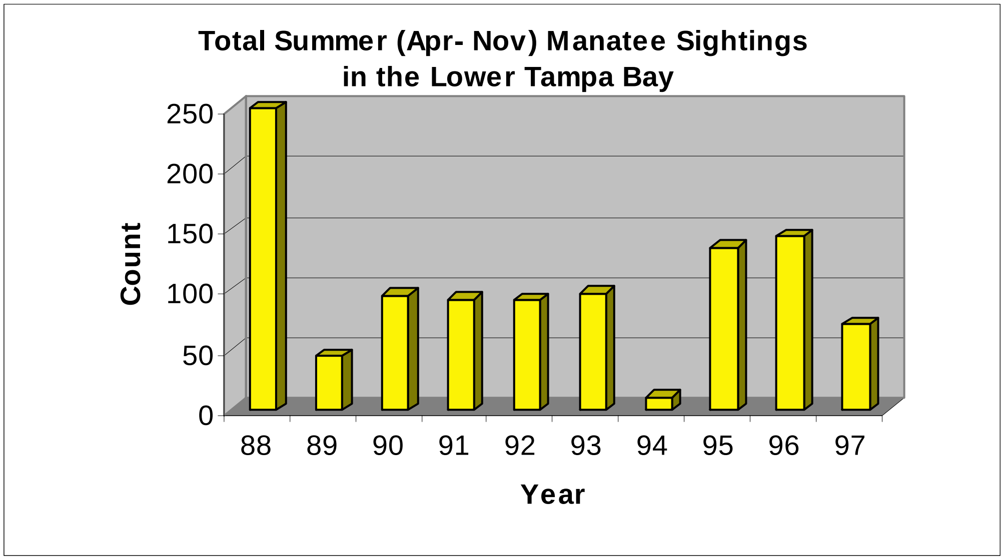

Figure 1a. Summary of the total number of manatee sightings in the lower Tampa Bay between 1988 and 1997 for the months of April to November (referred to as summer). Data derived from Florida Fish and Wildlife, 2000.

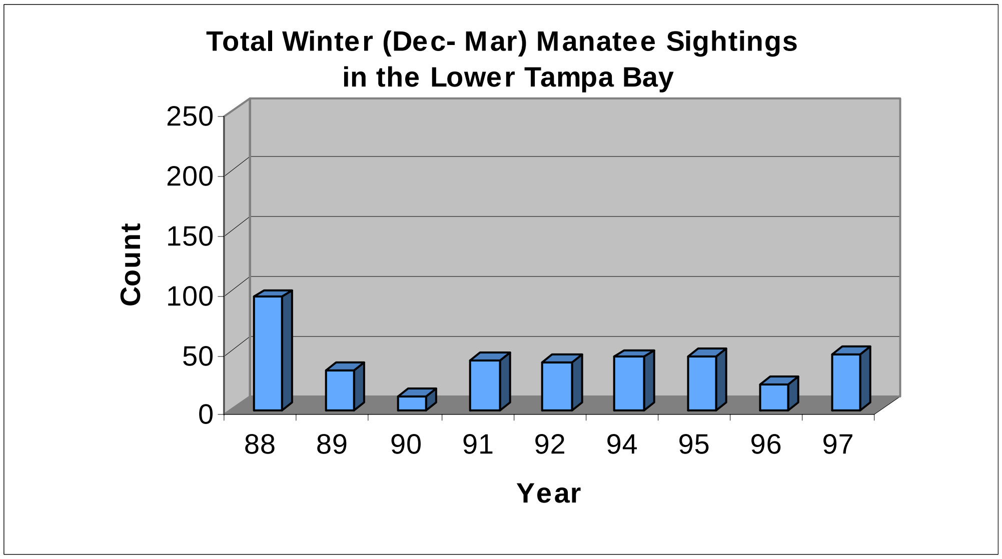

Figure 1b. Summary of the total number of manatee sightings in the lower Tampa Bay between 1988 and 1997 for the months of December to March (referred to as winter). Data derived from Florida Fish and Wildlife, 2000.

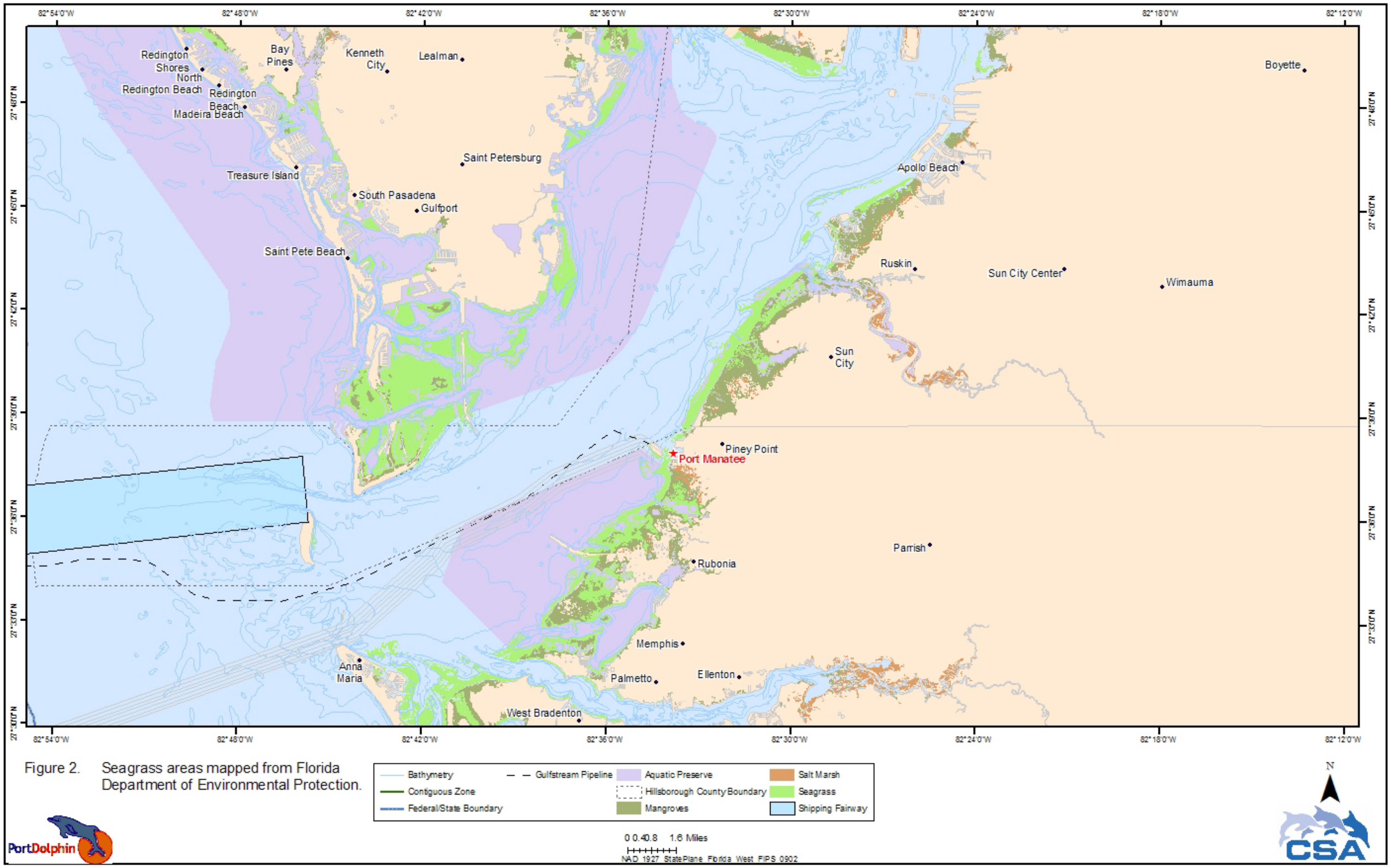

Figure 2. Tampa Bay map showing seagrass habitats derived from the Florida Department of Environmental Protection GIS database.

Appendix 1

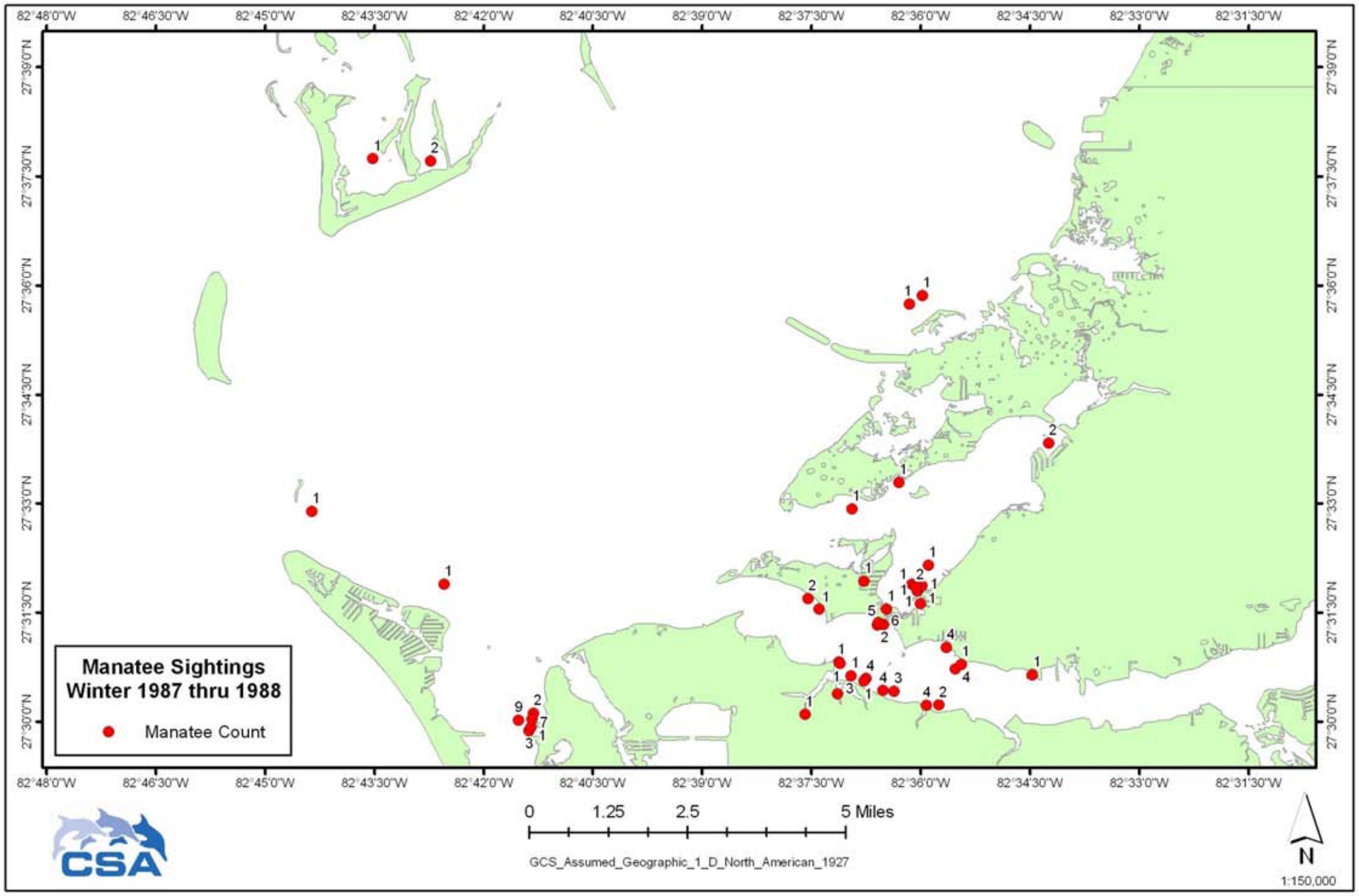

Figure 1. Manatee sightings for the winter season (December thru March) of 1987 thru 1988 - 94 total sightings.

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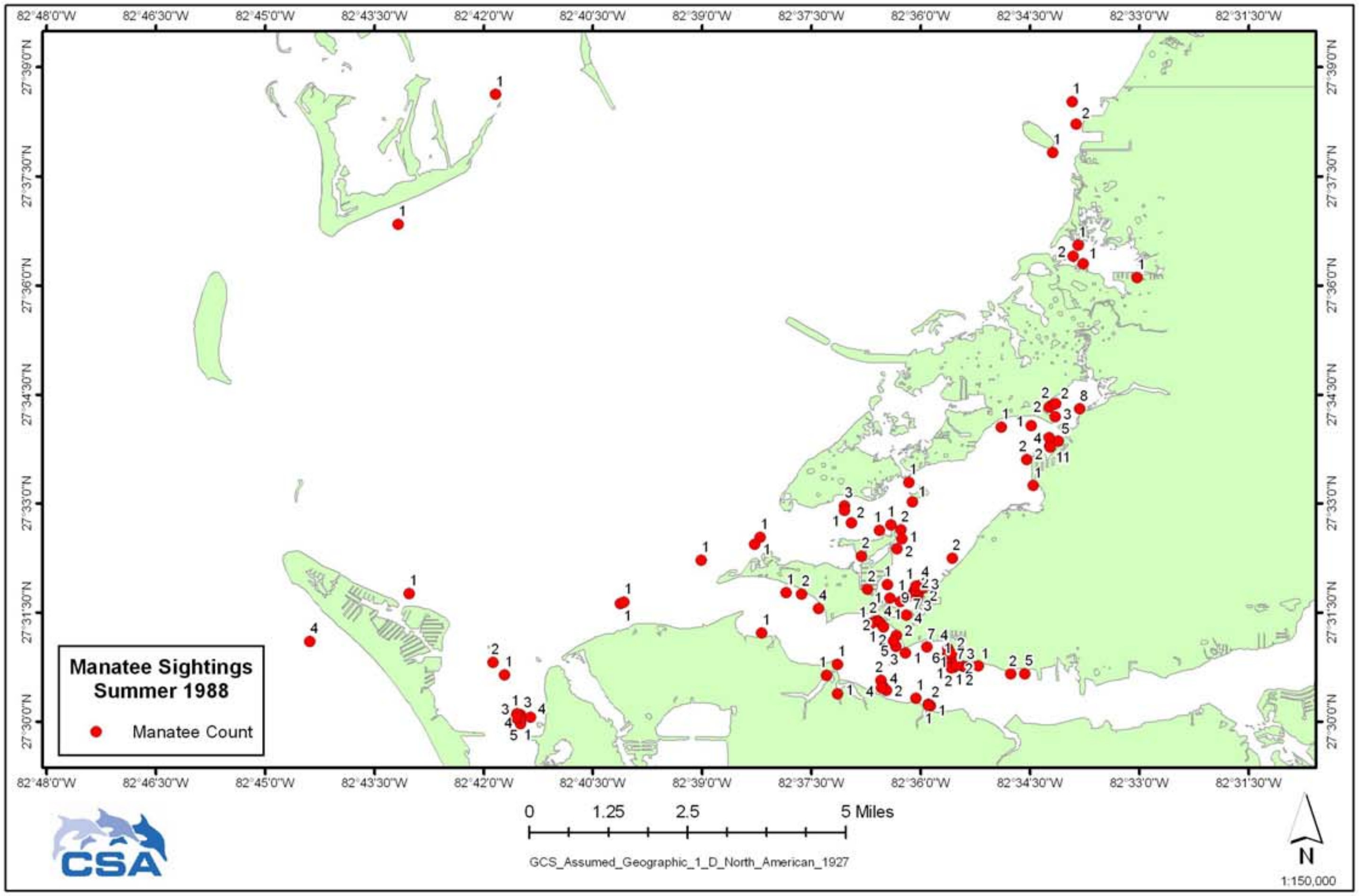

Figure 2. Manatee sightings for the summer season (April thru November) of 1988 - 251 total sightings.

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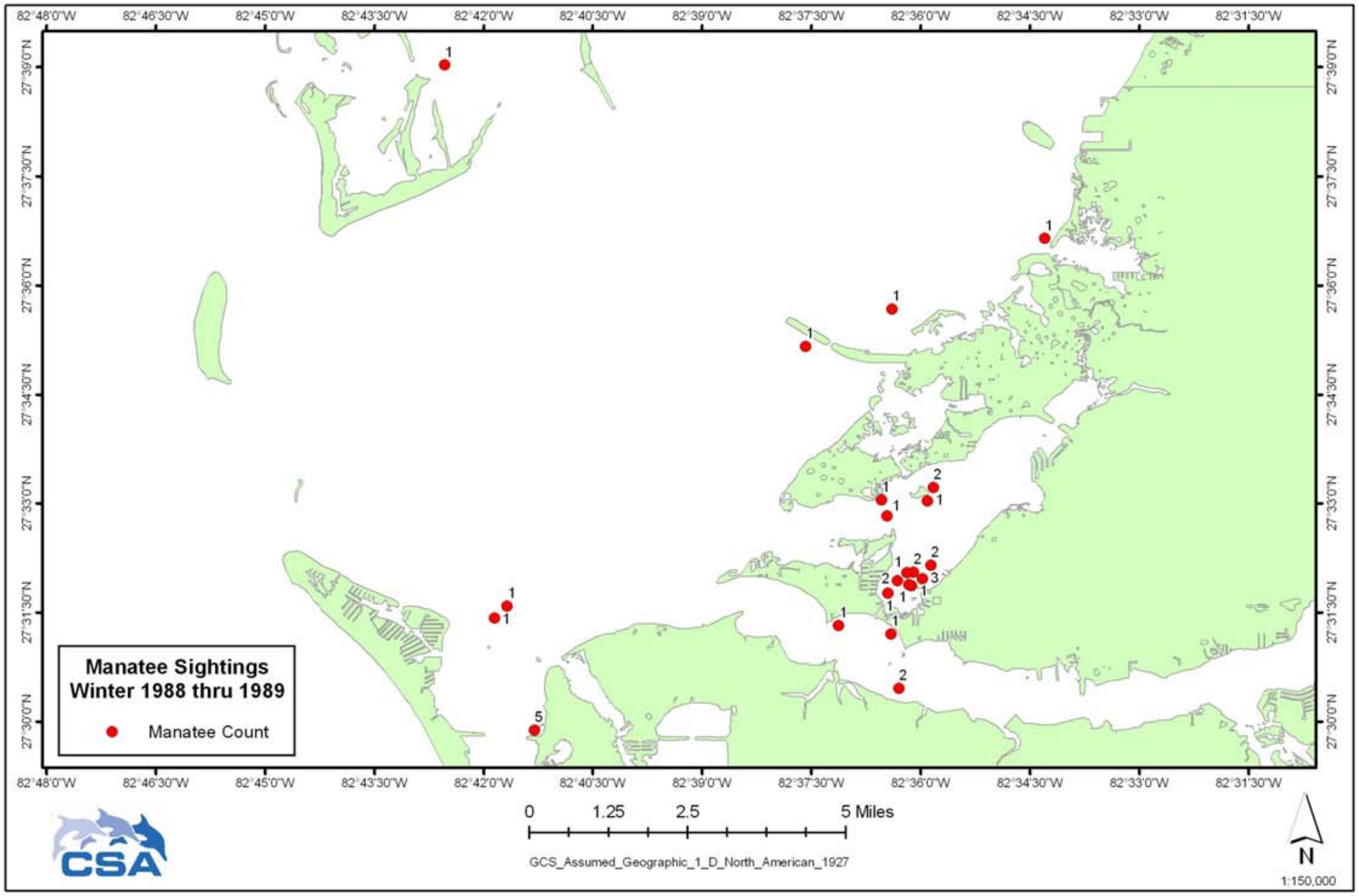

Figure 3. Manatee sightings for the winter season (December thru March) of 1988 thru 1989 - 33 total sightings.

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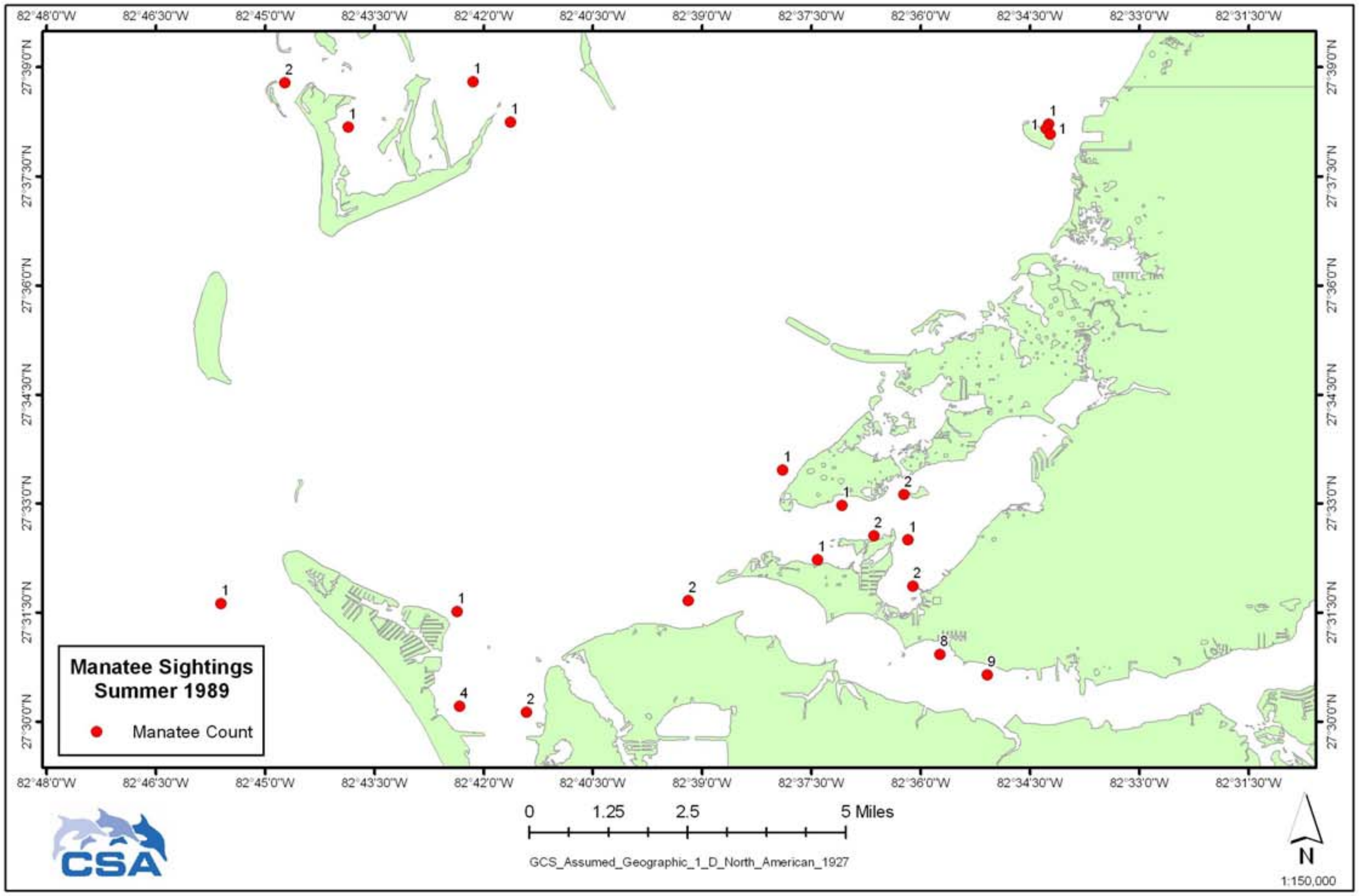

Figure 4. Manatee sightings for the summer season (April thru November) of 1989 - 45 total sightings.

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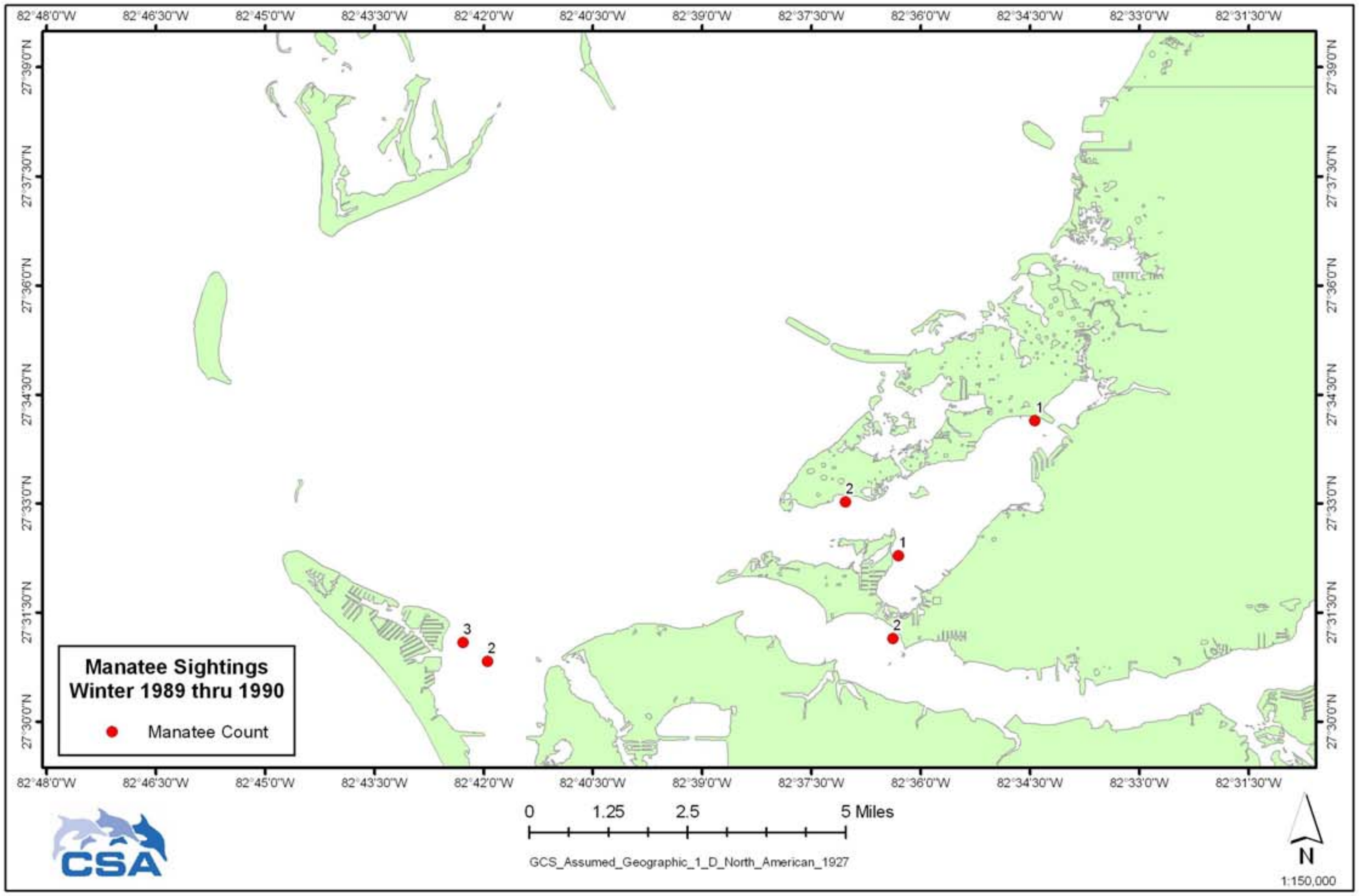

Figure 5. Manatee sightings for the winter season (December thru March) of 1989 thru 1990 - 11 total sightings.

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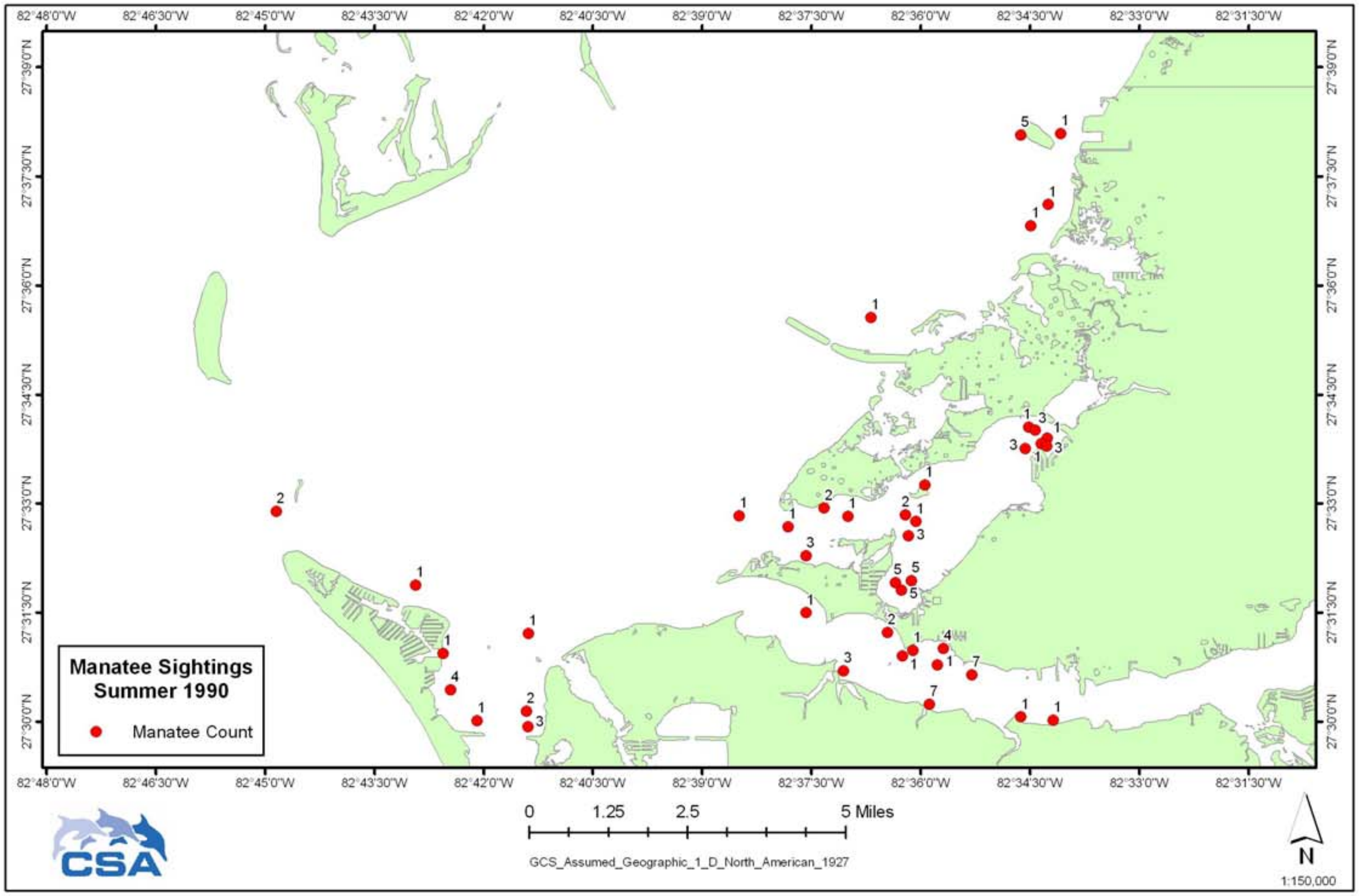

Figure 6. Manatee sightings for the summer season (April thru November) of 1990 - 95 total sightings.

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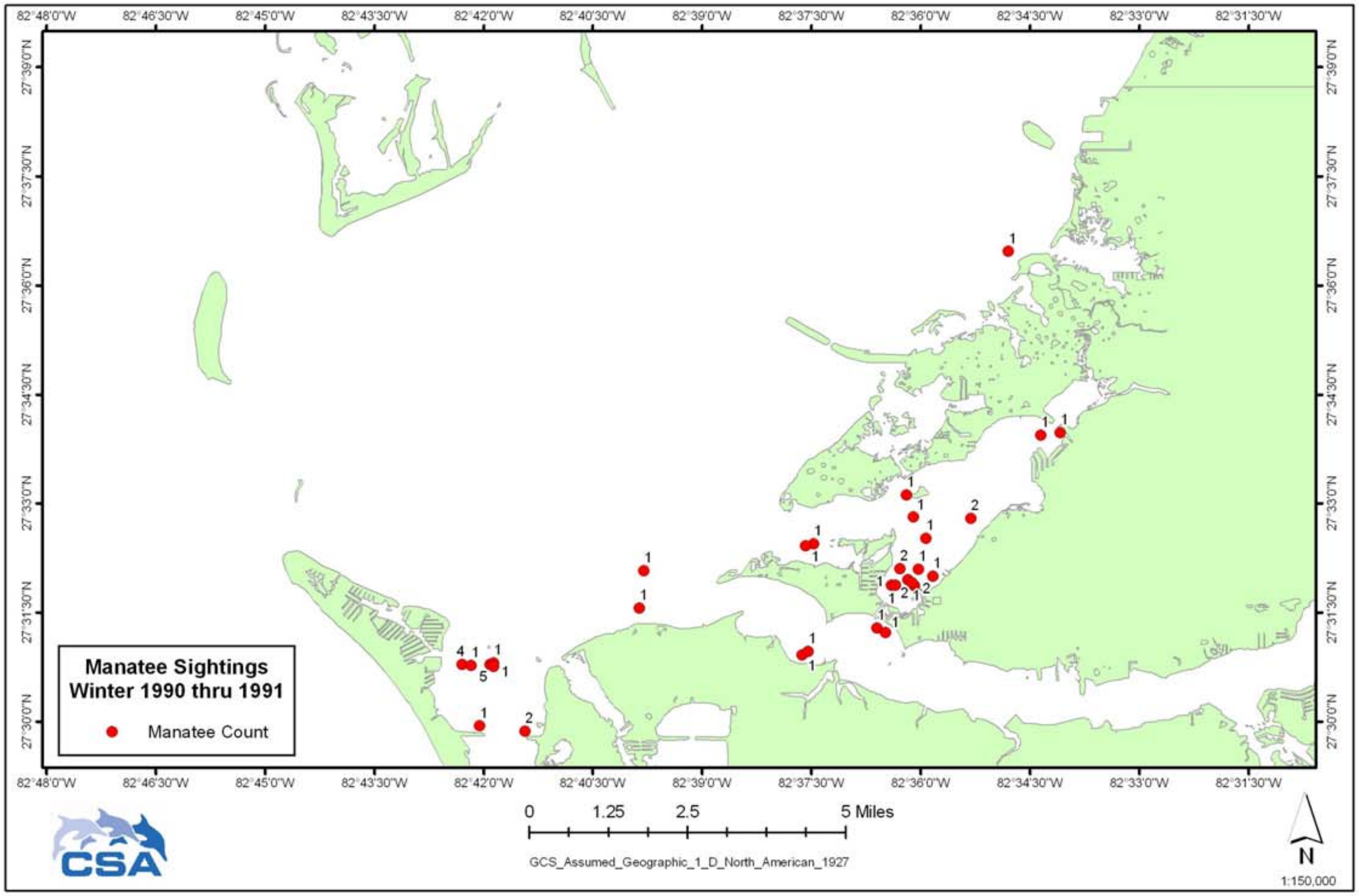

Figure 7. Manatee sightings for the winter season (December thru March) of 1990 thru 1991- 42 total sightings.

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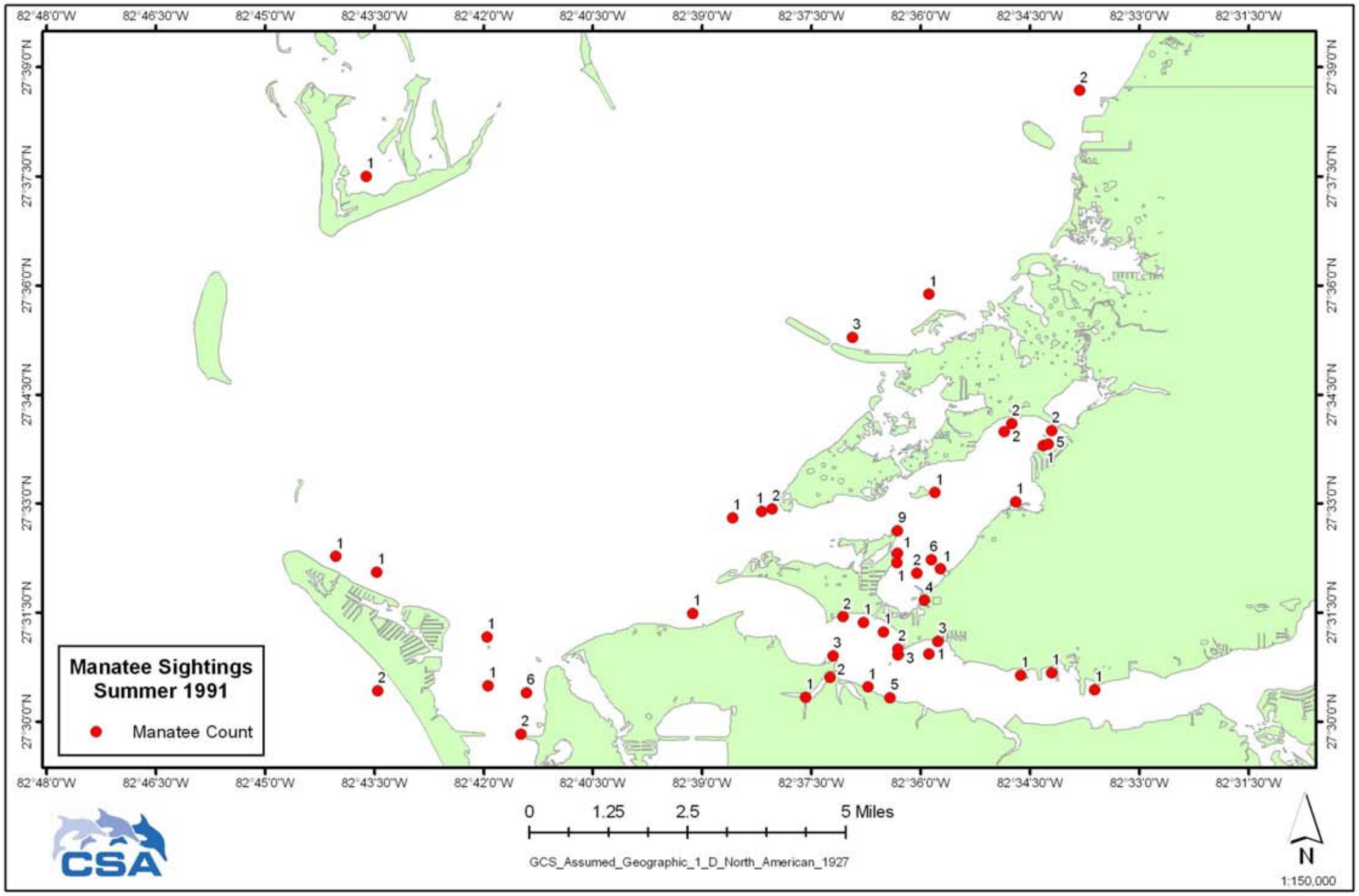

Figure 8. Manatee sightings for the summer season (April thru November) of 1991- 92 total sightings.

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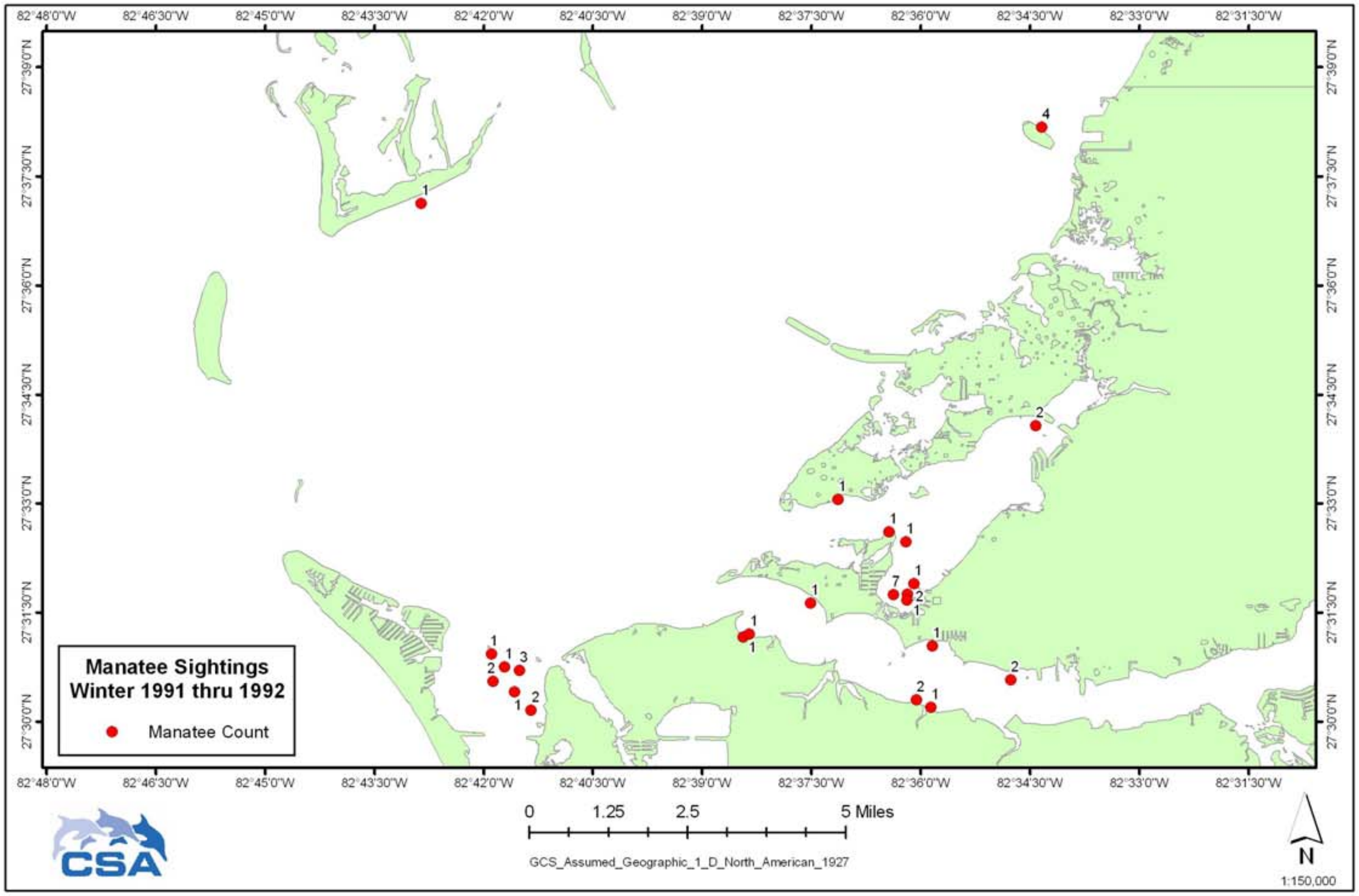

Figure 9. Manatee sightings for the winter season (December thru March) of 1991 thru 1992 - 40 total sightings.

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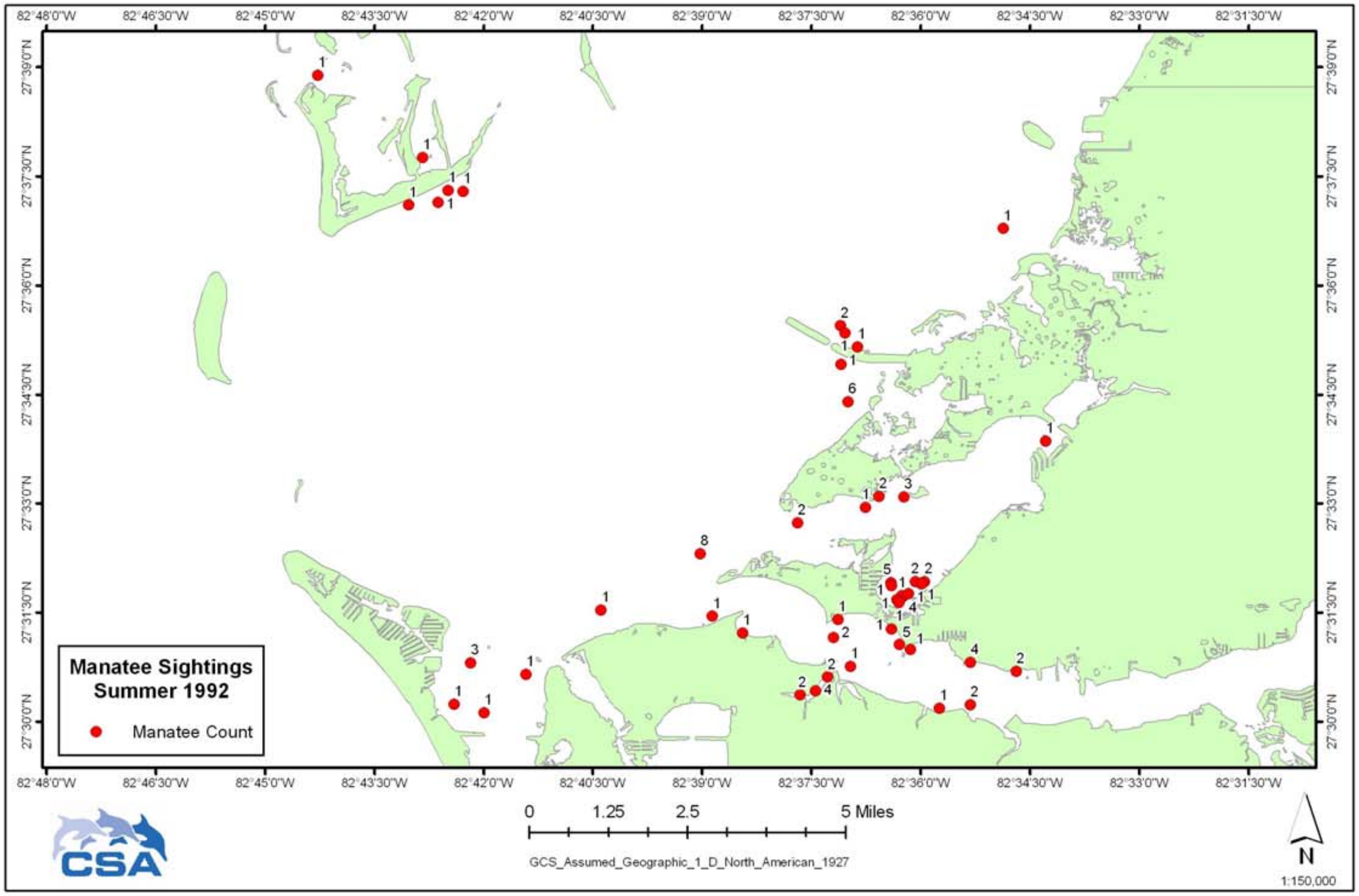

Figure 10. Manatee sightings for the summer season (April thru November) of 1992 - 91 total sightings.

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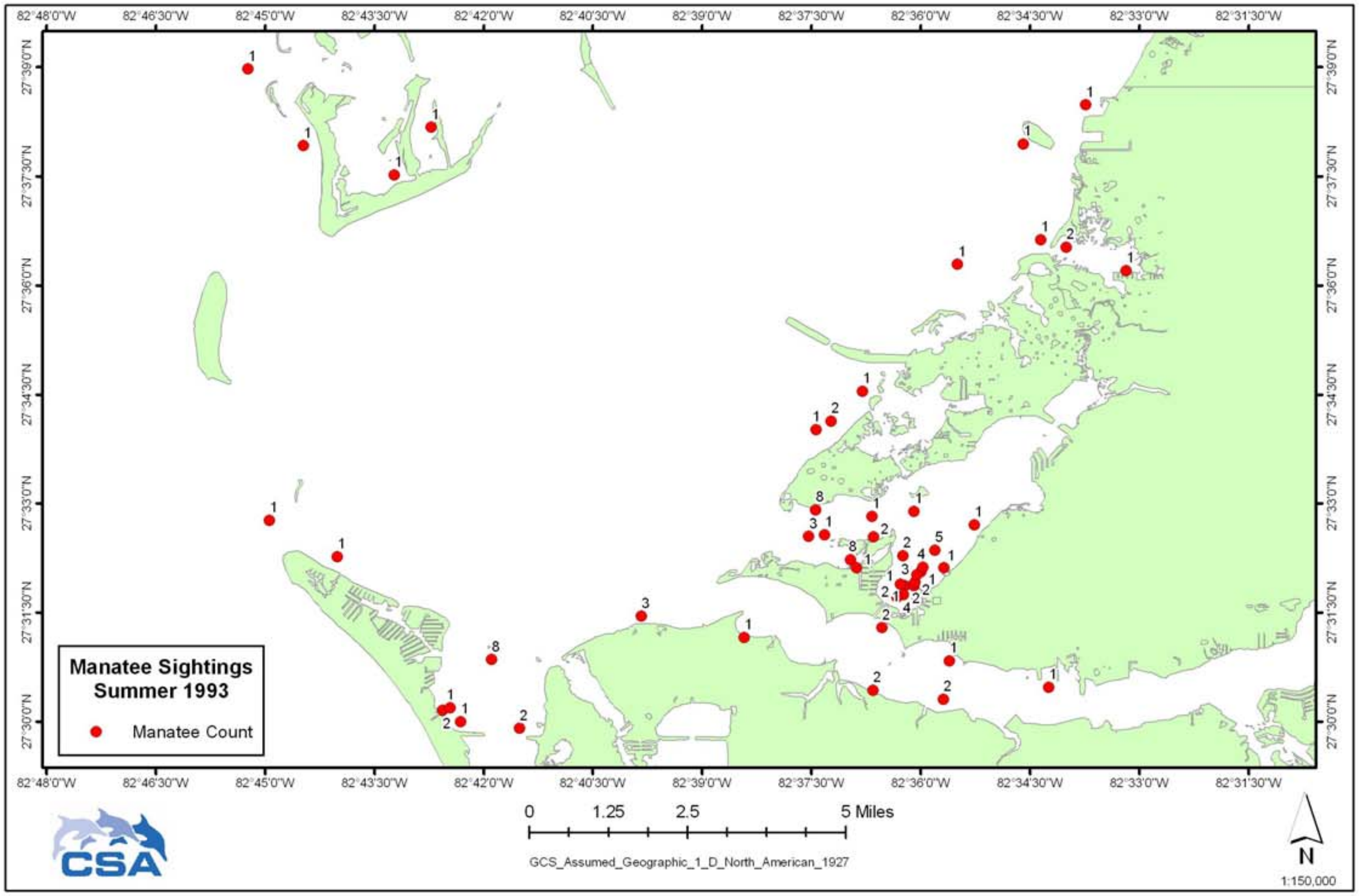

Figure 11. Manatee sightings for the summer season (April thru November) of 1993 - 97 total sightings.

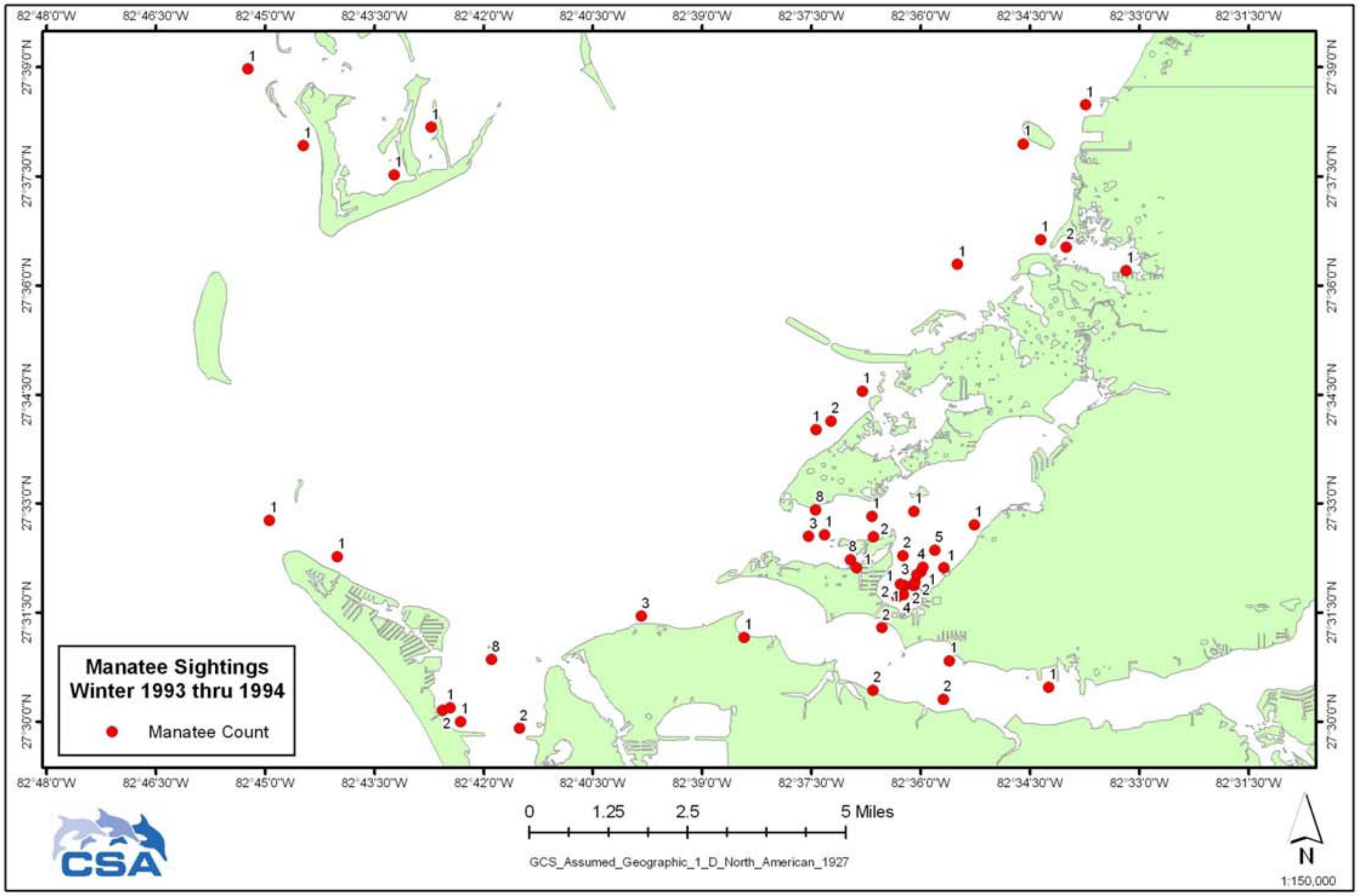

Figure 12. Manatee sightings for the winter season (December thru March) of 1993 thru 1994 - 44 total sightings.

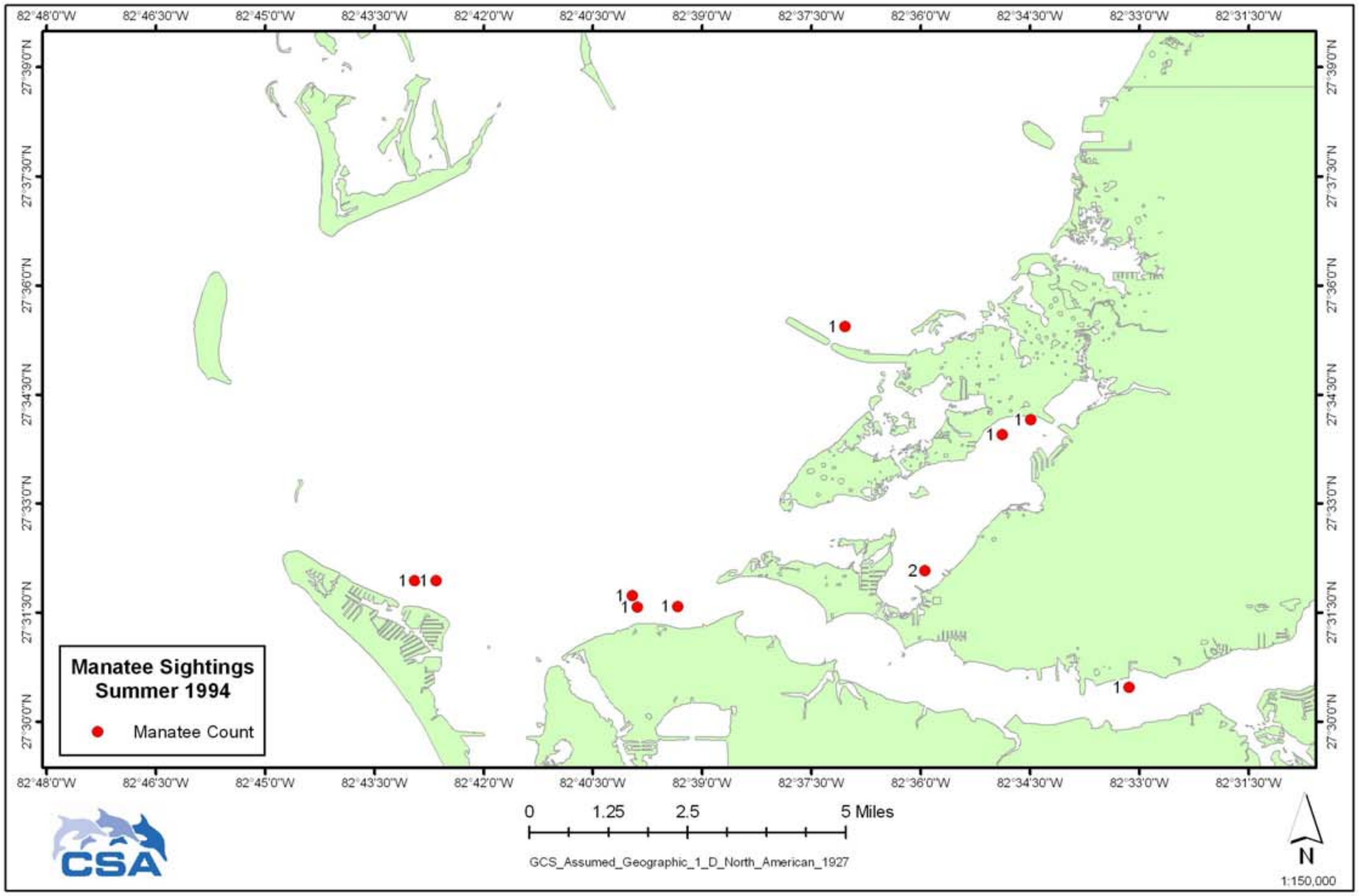

Figure 13. Manatee sightings for the summer season (April thru November) of 1994 - 11 total sightings.

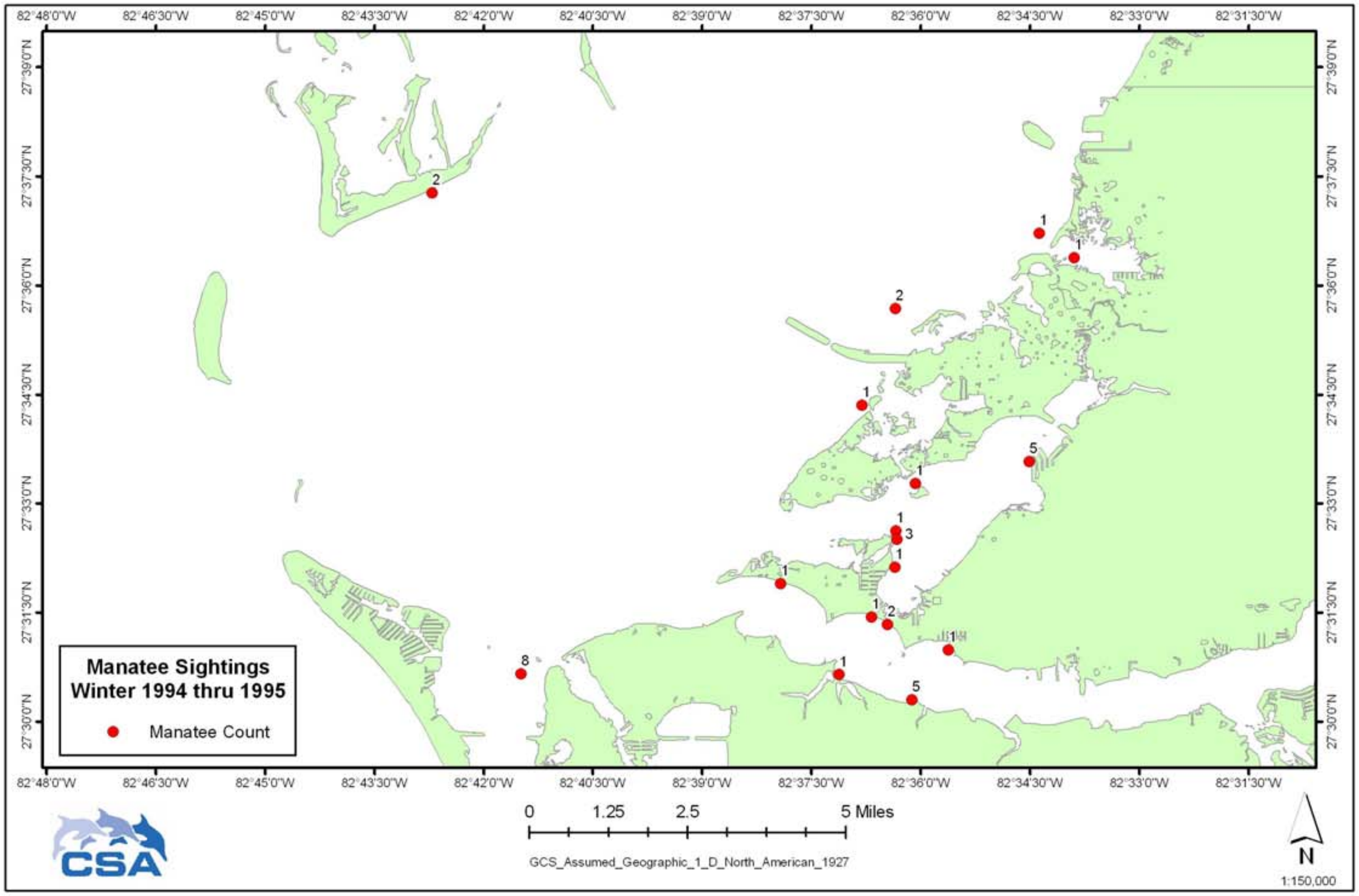

Figure 14. Manatee sightings for the winter season (December thru March) of 1994 thru 1995 - 45 total sightings.

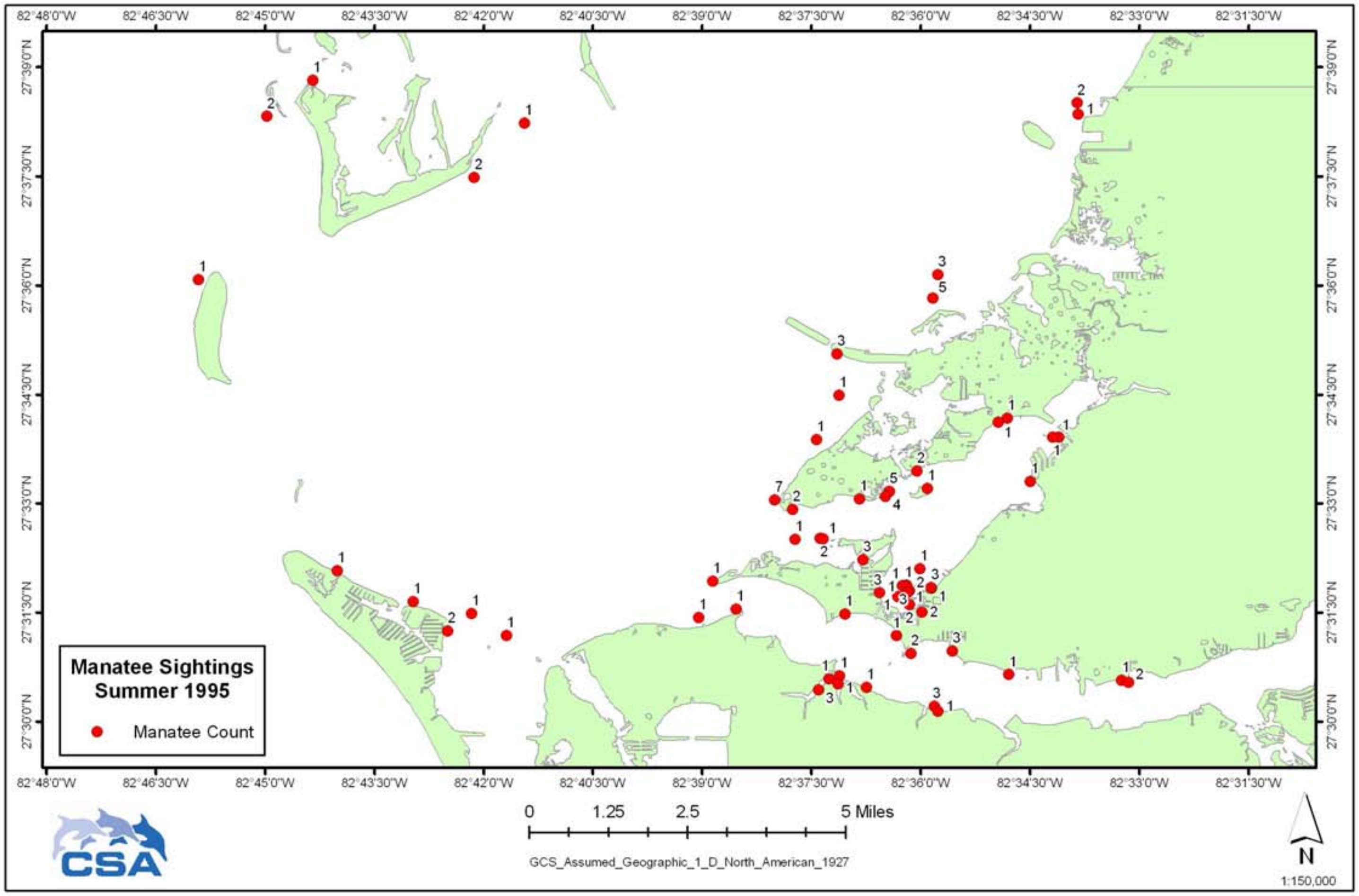

Figure 15. Manatee sightings for the summer season (April thru November) of 1995 - 135 total sightings.

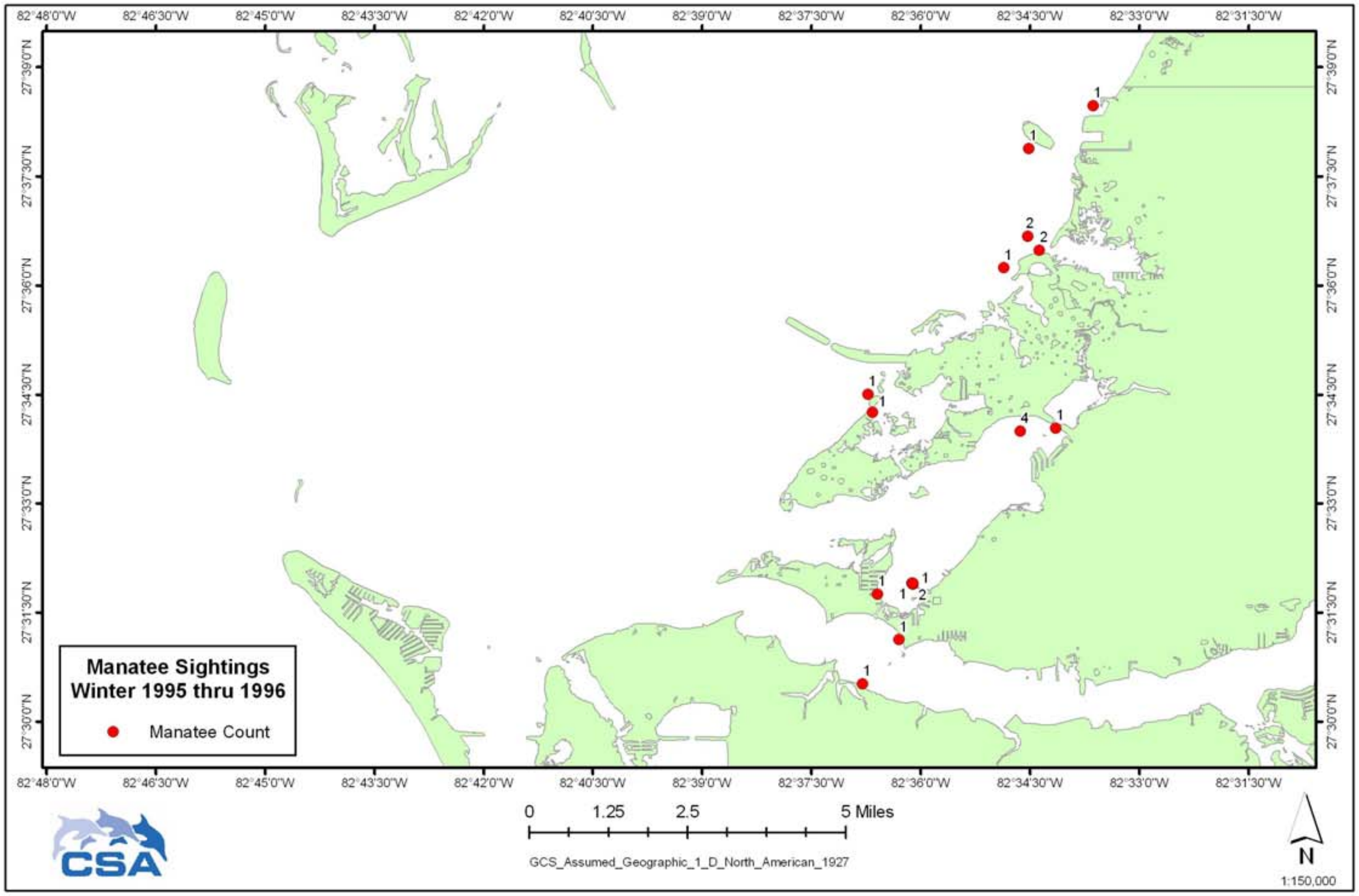

Figure 16. Manatee sightings for the winter season (December thru March) of 1995 thru 1996 - 21 total sightings.

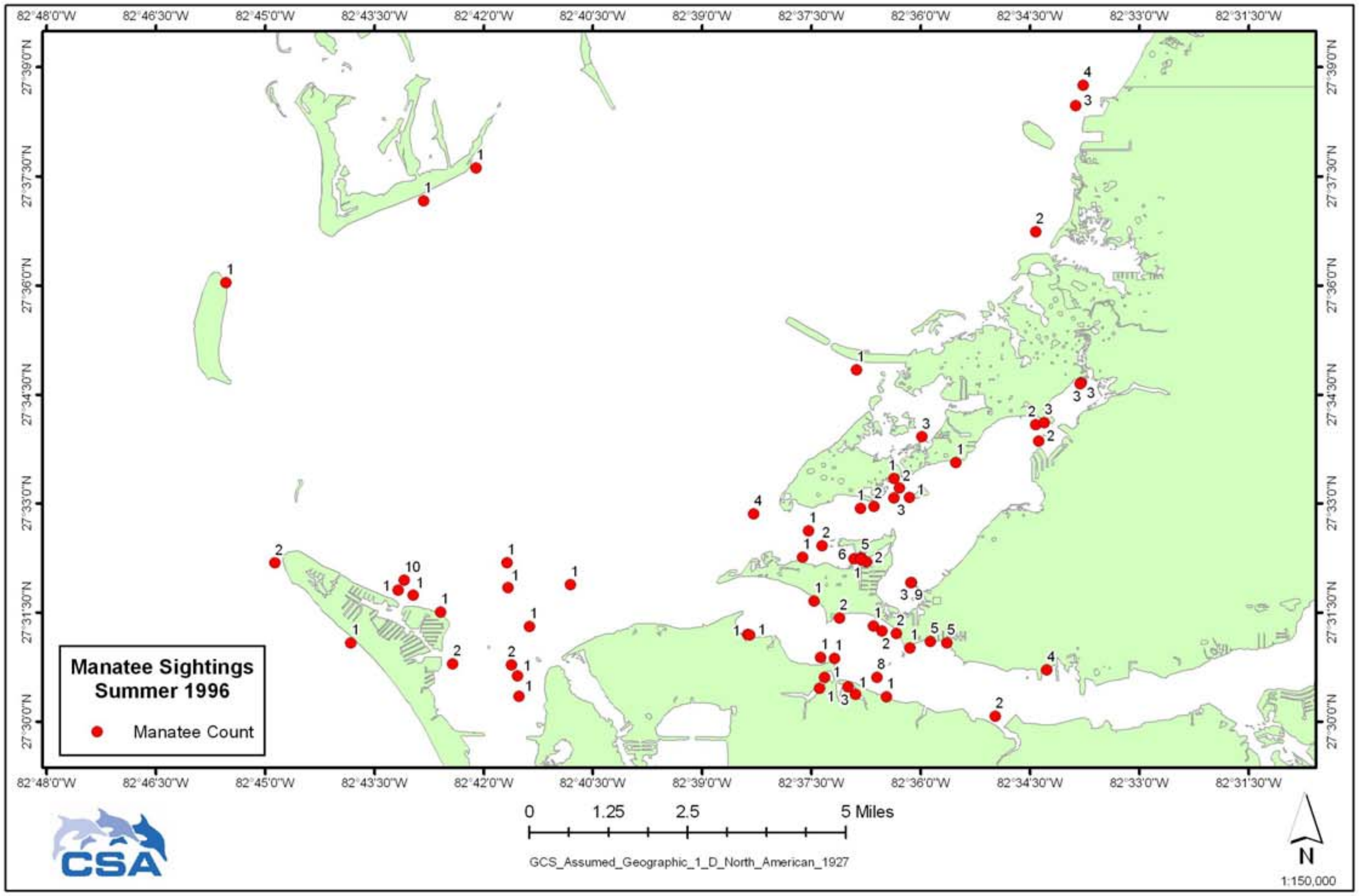

Figure 17. Manatee sightings for the summer season (April thru November) of 1996 - 144 total sightings.

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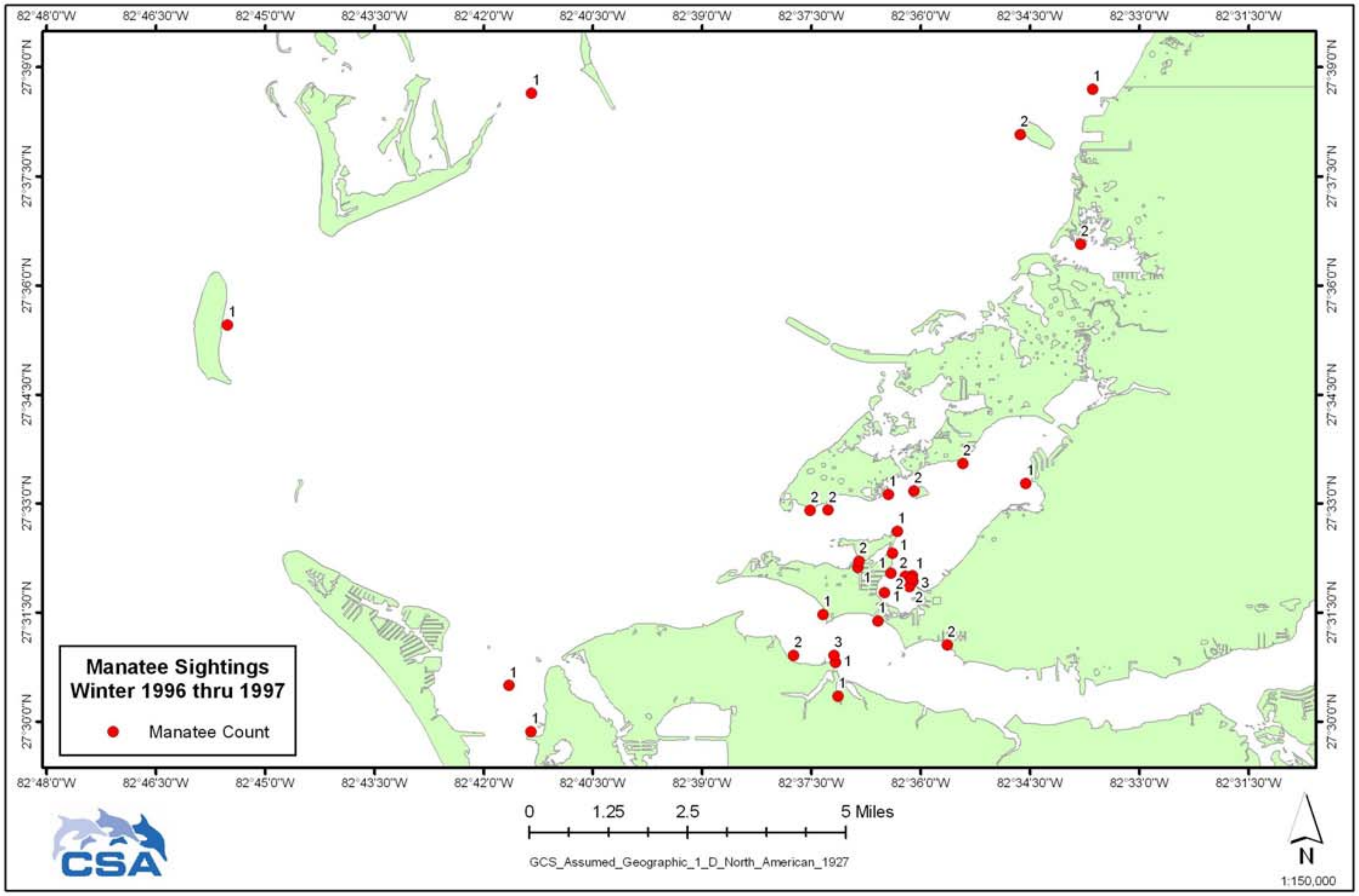

Figure 18. Manatee sightings for the winter season (December thru March) of 1996 thru 1997 - 47 total sightings.

-

Biological Resources	
45	Please provide information for the potential of sea turtle entanglement in the messenger or recovery line. Note that the Application addresses comments regarding entanglement of sea turtles in the mooring lines, but not the messenger or recovery lines. Fuller and Tappan (1986) reported a dead leatherback entangled in cable beneath an oil platform offshore of Louisiana. Loggerhead turtles have been found entangled in a wide variety of materials including steel and monofilament line, synthetic and natural rope, and discarded plastic netting materials (USFWS 1993).
Response	The possibility exists that a sea turtle could become entangled in the messenger or recovery line. According to several sea turtle recovery plans, entanglement of sea turtles in discarded fishing gear and other marine debris is a serious and growing problem (NMFS and USFWS, 1991a,b, 1992, 1993). Once entangled, turtles can be injured by the line itself, become susceptible to predation because of reduced mobility, or drown if they are unable to surface for air. Monofilament gill nets and fishing line appear to be the most common source of sea turtle entanglement in U.S. waters (NMFS and USFWS, 1991a,b, 1992, 1993). However, Fuller and Tappan (1986) reported a dead leatherback entangled in cable beneath an oil platform offshore of Louisiana. Each buoy placement area is about 2.5 km in diameter and has an area of about 5 km^2. Based on the seasonal turtle densities provided in Table 4-15 of Volume II (6.0 to 19.2 turtles per 100 km^2), one would expect 0.3 to 1.0 turtles in an area of that size, if turtles were distributed randomly. Although there is evidence that some sea turtles take up residence, at least briefly or seasonally, at platforms or other hard bottom structures, a statistical study of such associations in the Gulf of Mexico produced mixed results, with positive associations in a few areas but little or no association in others (Lohoefener et al., 1990). The buoy locations are in an area where extensive low-relief hard bottom habitat already exists, so the subsea buoys would not constitute a unique feature likely to attract large numbers of turtles from surrounding areas. Considered in perspective, the possibility of turtle entanglement in the messenger and recovery lines pose a very small risk of death or injury. There would be two buoy locations in a small area, and relatively few turtles would be expected to encounter them. In contrast, gill nets and discarded monofilament line are widely distributed and can "sweep" large areas of the ocean as they move. Similarly, as documented in the various Sea Turtle Recovery Plans, incidental take in trawls poses a much greater risk because of the large area of seafloor swept. REFERENCES Fuller, D.A. and A.M. Tappan. 1986. The occurrence of sea turtles in Louisiana coastal waters, pp. 171-173. In: Proceedings, Seventh Annual Gulf of Mexico Information Transfer Meetings. U.S. Department of the Interior, Minerals Management Service, New Orleans, LA. Lohoefener, R., W. Hoggard, K. Mullin, C. Roden, and C. Rogers. 1990. Association of sea turtles with platforms in the north-central Gulf of Mexico. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 90-0025. National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991a. Recovery plan for U.S. population of Atlantic green

	turtle. National Marine Fisheries Service, Washington, DC. National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991b. Recovery plan for U.S. population of loggerhead turtle. National Marine Fisheries Service, Washington, DC. National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery plan for leatherback turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico. National Marine Fisheries Service, Washington, DC. National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1993. Recovery plan for hawksbill turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico. National Marine Fisheries Service, St. Petersburg, FL.

Biological Resources	
46	Please provide measures proposed to minimize turbidity impacts associated with construction of the pipeline through the Terra Ceia Aquatic Preserve. Has a contingency plan been developed in case the Governor doesn't approve the right-of-way easement or consent of use? If so, please provide details.
Response	Port Dolphin is in the process of finalizing and submitting a proposed re-route around the Terra Ceia Aquatic Preserve. In addition, Port Dolphin plans to further minimize potential turbidity through deployment of plows and/or armoring by means of concrete mattresses to protect the pipeline, versus mechanical jetting which fluidizes the soil creating high density turbidity. Port Dolphin has engaged Applied Science & Associates (ASA) to model potential turbidity impacts to be generated during project construction activities. The results of this modeling report will be utilized by Port Dolphin to determine whether additional mitigation measures will be necessary. This report will be submitted to the USCG in November, 2007

Biological Resources	
47	Please provide details on the submergence and retrieval of the STL buoy. How fast is the buoy dropped and recovered by the winch and recovery line? There are reports of loggerheads being associated with offshore structures. Are there any potential impacts associated with sea turtles being trapped beneath or above the buoys when moved?
Response	Please refer to Operation Procedure Doc 1410-APL-O-KA-0001 STL Operation procedure Chapter 9 and 11 which is found in Volume III Pages 271-275: The "Connect" operation includes the following steps: 1. Vessel approach to the STL buoy 2. Pick-up of messenger line 3. Connection of STL buoy 4. Connection of gas transfer system (in the vessel). Total time required to complete a normal STL buoy connect operation is estimated to last about 60 minutes. The "Normal Disconnect" operation includes the following steps: 1. Disconnection of the gas transfer system 2. Disconnection of the STL buoy Total time required to complete a normal STL buoy disconnect operation is estimated to last about 60 minutes. In normal conditions, the STL buoy will be lowered controlled by the winch onto the landing pad, however the landing pad and STL Buoy are designed to withstand a free drop onto the landing pad. The emergency disconnect operation is estimated to require about 15 minutes, including time for disconnection of the gas transfer system. The STL landing pad is 15 m in diameter. Wyneken (1996) reported swimming speeds of loggerhead turtles are 0.33 to 0.47 m/s on the basis of the recapture of tagged turtles. Minamakawa et al. (2000) reported similar values based on telemetry of individual loggerheads. Adult green turtles have been noted to swim at speeds of about 0.8 m/s (Yasuda et al., 2003). Assuming a typical speed of 0.5 m/s, a turtle resting in the center of the STL landing pad could clear the outer edge in about 15 seconds. As the process of raising or lowering the STL buoy would occur over a period of several minutes, the risk of a sea turtle being injured during the process is very small. The landing pad has an area of 177 m^2. Based on the seasonal turtle densities provided in Table 4-15 of Volume II (6.0 to 19.2 turtles per 100 km^2), one would expect 0.00001 to 0.00003 turtles in an area of that size, if turtles were distributed randomly. Although there is evidence that some sea turtles take up residence, at least briefly or seasonally, at platforms or other hard bottom structures, a statistical study of such associations in the Gulf of Mexico produced mixed results, with positive associations in a few

areas but little or no association in others (Lohoefener et al., 1990). The buoy locations are in an area where extensive low-relief hard bottom habitat already exists, so the landing pad would not constitute a unique feature likely to attract large numbers of turtles from surrounding areas. Overall, based on what is known about sea turtle densities and their swimming speed vs. the movement of the buoy, it is unlikely that raising and lowering the STL buoy poses a significant risk of injuring or killing a sea turtle.

REFERENCES

Lohoefener, R., W. Hoggard, K. Mullin, C. Roden, and C. Rogers. 1990. Association of sea turtles with platforms in the north-central Gulf of Mexico. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 90-0025.

Minamikawa, S., Y. Naito, K. Sato, Y. Matsuzawa, T. Bando, and W. Sakamoto. 2000. Maintenance of neutral buoyancy by depth selection in the loggerhead turtle *Caretta caretta*. J. Exp. Biol. 203:2967-2975.

Wyneken, J. 1996. Sea turtle locomotion: Mechanics, behavior and energetics, pp. 165–198. In: P.L. Lutz and J.A. Musick, eds. *The Biology of Sea Turtles*. Boca Raton, FL: CRC Press.

Yasuda, T., H. Tanaka, K. Kittiniwattanawong, W. Sakamoto, H. Masada, W. Klom-In, and N. Arai. 2003. Study on spatial diving behavior of sea turtles using brand-new data loggers. 17th International Symposium on Biotelemetry, Brisbane, Australia.

Biological Resources	
48	Please provide information on the discharge temperature of the 25.2 million gallons of water for installation and testing. Would the treated water be discharged at ambient water temperature? Florida manatees have limited tolerance to cold and congregate at warm-water discharge outfalls within Tampa Bay to prevent cold-related deaths.
Response	In the Draft NPDES permit application included in Volume I, Appendix D, Page 30 it is indicated that the anticipated discharge temperature of the test water would be approximately the same as seawater.

Project Description and Alternatives	
49	Please provide details for design of lighting systems at the buoy locations and on vessels to minimize impacts on sea turtles. What type and intensity of lights will be used on the marker buoys and vessels? Lighting on the water can interfere with hatchling dispersal and increase mortality from fish predation (FFWCC 2007).
Response	Lighting system details of the SRV are provided in the 145 m^3 SRV Specification (Volume III, Section 4A, Part 84, page 0-490). The buoy marker will include a yellow flashing light. The average level of lighting at the vessels side (at sea level) will be 50 – 55 Lux, and at the buoy markers will be 900 – 1,000 Candela (Cd) (Alards method) and a peak of 400 – 500 Cd (Clear lens). The buoy marker lighting specification is attached. The main issue concerning lighting and sea turtles is disorientation of hatchlings by artificial lighting on or near nesting beaches (Witherington, 1997; Witherington and Martin, 2000). Attraction to distant offshore lights is not the problem; rather, it is nearby, onshore lighting (e.g., from parking lots and buildings) that causes turtles to crawl onshore instead of heading out to sea. Due to the distance offshore, lighting at the STL buoy locations is expected to have no detectable impact (beneficial or adverse) on sea turtle hatchlings. Offshore structures such as drilling rigs or drillships typically are visible from shore at distances of 5 to 16 km (3 to 10 miles), and on a clear night, lights on top of offshore structures could be visible to humans on shore to a distance of approximately 32 km (20 miles) (Minerals Management Service [MMS], 2002). The buoy locations are 45 km (28 miles) offshore and therefore, the associated lighting will not be visible to humans or turtle hatchlings. After leaving their nesting beach, turtle hatchlings swim offshore, eventually residing in drifting sargassum mats and other flotsam (Carr 1986a,b). Once in the water, turtle hatchlings at or just below the ocean surface would be even less likely than a human standing on the shoreline to perceive distant offshore lights. It has been noted that hatchlings may rely less on light cues offshore (Salmon and Wyneken, 1990). Also, the distribution of hatchlings in offshore waters is likely to be much more diffuse than at the nesting beach, and the chance of numerous turtle hatchlings encountering a particular offshore structure (e.g., a ship moored at the STL buoy) is remote. As of 2005, there were over 4,000 bottom-founded structures (e.g., jacketed platforms, caissons, and well protectors) and 29,500 well-related structures in the northern Gulf of Mexico (MMS, 2005). Many of these structures are well-lit, and the MMS (2002) speculated that if hatchlings were attracted to brightly-lit platforms, they could be susceptible to increased predation since large birds and predatory fishes also congregate around these structures. The National Marine Fisheries Service (NMFS) addressed this issue in Biological Opinions for several oil and gas lease sales in the Gulf of Mexico (NMFS, 2001, 2002). The NMFS analysis notes that attraction to offshore locations is less problematic than attraction to landside locations, as the issue is to ensure that hatchlings head to sea rather than remaining onshore. NMFS concludes that while some adverse effects may occur from brightly lit platforms, “it is unlikely that they will appreciably reduce the reproduction, numbers, or distribution of sea turtles in the wild” (NMFS, 2001, 2002).

REFERENCES

Carr, A.F., Jr. 1986a. Rips, FADS and little loggerheads. Bioscience 36:92-100.

Carr, A.F., Jr. 1986b. New perspectives on the pelagic stage of sea turtle development. NOAA Tech. Memo. NMFS-SEFC-190. 36 pp.

Minerals Management Service (MMS). 2002. Minerals Management Service. 2002. Gulf of Mexico OCS oil and gas lease sales: 2003-2007. Final Environmental Impact Statement. Central Planning Area Sales 185, 190, 194, 198, and 201; Western Planning Area Sales 187, 192, 196, and 200. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS EIS/EA MMS 2002-052.

Minerals Management Service (MMS). 2005. Structure removal operations in the Gulf of Mexico outer continental shelf: Programmatic environmental assessment. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS EIS/EA 2005-013.

National Marine Fisheries Service. 2001. Endangered Species Act, Section 7 Consultation, Gulf of Mexico OCS Lease Sale 181. Appendix B in: Gulf of Mexico OCS Oil and Gas Lease Sale 181, Eastern Planning Area. Final Environmental Impact Statement. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS EIS/EA MMS 2001-051. June 2001.

National Marine Fisheries Service. 2002. Endangered Species Act, Section 7 Consultation, Gulf of Mexico outer continental shelf multi-lease sale (185, 187, 190, 192, 194, 196, 198, 200, 201). Southeast Regional Office, St. Petersburg, FL. F/SER 2002/00718. November 2002.

Salmon, M., and J. Wyneken. 1990. Orientation by swimming sea turtles: role of photic intensity differences while nearshore. Proceedings of the Tenth Annual Workshop on Sea Turtle Biology and Conservation. NOAA Tech. Memo SEFSC-278: 107-108.

Witherington, B.E. 1997. The problem of photopollution for sea turtles and other nocturnal animals. In J. R. Clemmons and R. Buchholz (eds.). Behavioral Approaches to Conservation in the Wild. Cambridge University Press, Cambridge, England. Pp. 303-328.

Witherington, B.E. and R.E. Martin. 2000. Understanding, assessing, and resolving light-pollution problems on sea turtle nesting beaches. 2nd ed. rev. Florida Marine Research Institute Technical Reports TR-2, 73 pp.

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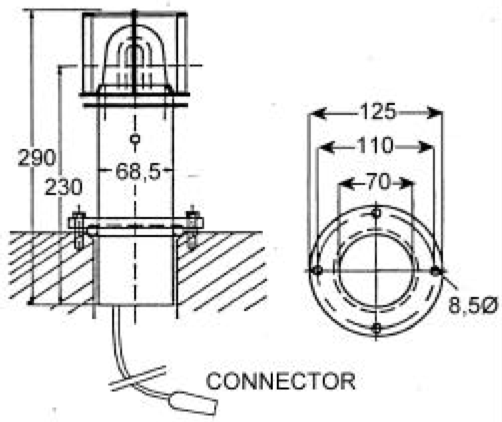

Type: **Pulsolux XI-9LEM**

Art. No. 000125

Low voltage (7-15VDC) Electronic flash light for maritime applications with very high energy efficiency and low internal temperature and well suited for battery operation. The lamp has no moving parts and the electronics are completely moulded in to protect against shock, moisture and corrosion. The flash rate is adjustable with a miniature potentiometer beside the lamp socket. Its flash pulses are very intense, and work with very high energy efficiency. Power losses in the electronics are very low and internal temperature problems are avoided. Daylight switch is included and is situated on the flash tube socket. For continious operation this light sensitive diode should be removed or shielded. On the XI-9LEM the input cable is in the bottom and the lamp is mounted with a flange and gasket to buoys etc.

Technical data:

Input voltage:	7 - 18 VDC.
Max power consumption:	4W at 40 flashes per minute
Adaption outdoors:	Watertight connector.
Light intensity:	In eff: 900 - 1000 Cd. (Alards method).
	Peak: 400 - 500.000 Cd. (Clear lens).
Light distribution:	Horizontal:360 deg. Vertical 105 degrees.
Lens:	Temperature and shock resistant glass
Colours:	Clear, red, green ,yellow (amber)
Flash rate:	20 - 40 flashes/min. Adjustable from inside of lens.
Luminious range:	9 - 25 km (5 - 14 nautic miles) dependent on lens colour.
Tube:	Replaceable Xenon discharge tube, with daylight switch.
Cable:	Ölflex 540P, 2x0,75mm^2.
Temperature range:	-50 to +75 degrees C.
Housing:	Stainless steel.
Protection:	IP66
Weight:	2,5 kg.
Life time:	18 mill. flashes at 40 flashes per minute.
Daylight switch:	At approx. 200 lux.
Battery	Separate 10,8V. (Lithium)
Approvals:	Nemko L8149101
	Approved by Norwegian Polar Institute for arctic areas.

Connection:

Amphenol 44. A+ (Brown), B- (Blue).

Doc: 06172 Date: 2001.02.08

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Org.No.
NO.941330061 M.V.A

Biological Resources	
50	Please provide details on how the bird colonies on Passage Key will be avoided to the extent feasible. Are there any speed reduction measures to minimize disturbance to nesting, feeding, and resting colonies of terns?
Response	The construction activities will be performed to the extent practicable to avoid these sensitive areas during bird nesting season. In addition, the lay barge and support vessels move very slowly down the pipeline corridor during installation activities. Any local noise ordinances will also dictate construction work hours in this area. Also, Volume II, Appendix F Construction and Operational Mitigation Measures addresses the mitigation measures proposed to minimize impacts to marine mammals and birds near the project area.

Biological Resources	
51	Please provide the information from the Florida Department of Environmental Protection (FDEP) on the ineffectiveness of rock armoring, where pipelines cannot be buried (see Response to NOAA Completeness Recommendation Number 8).
Response	During preliminary meetings with FDEP, Port Dolphin was told that along portions of the Gulfstream pipeline where rock dumping was performed the pipeline was exposed due to moving of the rock from the hurricanes that have passed through the area since placement of the rock. In addition, Port Dolphin was also instructed that smaller obstructions were desirable. The concrete mattresses can provide similar levels of protection with less vertical obstruction. For that reason, Port Dolphin has proposed the use of concrete mattresses in lieu of rock dumping.

Biological Resources	
52	What are the references for Tables 4-1, 4-2, and 4-3? Please provide these references if they are not included in the references requested below.
Response	These tables were developed based on CSA's significant experience with this geographic portion of the Gulf of Mexico; however, below are several applicable references. DARNELL, R.M. and J.A. KLEYPAS. 1987. Eastern Gulf shelf bio-atlas, a study of the distribution of demersal fishes and penaeid shrimp of soft bottom of the continental shelf from the Mississippi River Delta to the Florida Keys. OCS Study MMS 86-0041. U.S. Department of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, LA. DAROVEC, J.E., JR. 1995. Checklist and local-distribution analyses of fishes from the Hourglass Cruises Mem. Hourglass Cruises 4(1).139 p. HARKEY, S. and P. THURMAN. 1997. A summary of fixed-station sampling using a 183-m haul seine in Tampa Bay, Florida from 1994 to 1996. Unpublished Draft Report prepared by the Florida Marine Research Institute MOE, M.A., JR. and G.T. MARTIN. 1965. Fishes taken in monthly trawl samples offshore of Pinellas County, Florida, with new additions to the fish fauna of the Tampa Bay area. Tulane Stud. Zool. 12(4): 129-151. PIERCE, D.J. and B. MAHMOUDI. 2001. Nearshore fish assemblages along the central west coast of Florida. Bull. Mar. Sci. 68(2): 243-270.

Biological Resources	
53	Please cite (and provide the reference) for the FDEP protocol for offshore mitigation projects. Please include the reference for Table 4-4. (see page 4-21)
Response	The FDEP protocol used for the habitat classification is attached for you reference. The reference for Table 4-4 is the FDEP Protocol Regulatory Basis of Review Mitigation Protocol Offshore Southeast Florida.

Regulatory Basis of Review Mitigation Protocol
Offshore Southeast Florida

Purpose

Federal, state and county agencies are tasked with protecting and managing live-bottom communities, including hard and soft corals, hard-bottom substrates and the integral adjacent soft substrate communities. Reef and hard bottom communities are a highly valuable ecological and economic resource in Southeast Florida (Johns et al., 2001). These resources are threatened by numerous anthropogenic and natural stresses as well as stochastic events. The U.S. Coral Reef Task Force, Southeast Florida Action Strategy Team has identified construction of submarine infrastructure such as pipelines, outfalls and cables as anthropogenic threats to the nearshore reef and hard bottom systems of southeast Florida (SEFAST 2003). A management tool to reduce these threats is the permitting/licensing process in which the applicant works with the agencies to provide reasonable assurances environmental impacts have been avoided and minimized. Once avoidance and minimization of unacceptable impacts is accomplished, some impacts may be considered unavoidable and require mitigation to enhance or replace lost ecosystem function and structure. A single standardized method for determining appropriate mitigation for reef and hard bottom communities has not been used in the permitting/licensing processes at various levels of regulatory control in the past.

The methodology currently used by the Florida Department of Environmental Protection (DEP) for determining mitigation ratios is outlined in the DEP Environmental Resource Program Basis of Review, which has been proven and used extensively with conventional wetlands systems. The Basis of Review was developed for the water management districts and adopted by Florida DEP (Chapter 62-330, F.A.C.) to assist staff by identifying the permit review criteria used and information needed when reviewing environmental resource permit applications. Section 4.3 offers guidance on evaluating mitigation proposals and for determining the best approach to offset adverse impacts resulting from the regulated activities and how much mitigation (mitigation ratios) is needed to offset the impacts.

The Basis of Review is not limited to freshwater or brackish systems and can be applied to reef systems. The mitigation protocol described below applies the Basis of Review to determine appropriate mitigation ratios for unavoidable permitted and licensed impacts to reefs, hard bottom systems and intermixed soft bottom communities in the Southeast Florida region. The ratios determined from this methodology will provide reasonable assurances that lost ecosystem structure and function will be replaced.

Habitat Characterizations

Habitat characterizations in proposed construction areas are typically based on video and quantitative photo-documentation surveys submitted by applicants, literature review, empirical observations and expert knowledge of the area. Using these sources of information, four important marine habitat types were defined as follows:

Habitat Type	Description
Type A:	20-100% cover by attached epi-benthic biota and/or hard bottom with greater than or equal to 0.25 meters in relief, inclusive of sand components integral to these habitats. Essential Fish Habitat (EFH), Habitat Area of Particular Concern (HAPC)
Type B:	5-20% cover by attached epi-benthic biota and/or hard bottom with less than 0.25 meter in relief, inclusive of sand components integral to these habitats. EFH HAPC
Type C:	Breakwater spoil area. EFH HAPC
Type D:	Sand (soft substrate/sedimentary habitat) in proximity to reef/hard bottom resources, a sandy veneer over hard substrate with less than 5% attached epi-benthic biotic coverage. EFH

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* specific seagrass mitigation plans to be developed separately

**Impacts to soft substrate/sedimentary habitats not associated with hard bottom ecotones are not included in the matrix.

The value and function of habitat types A and B are well-established through literature and regulation. Type C habitat, the breakwater spoil area, was considered separately from Type B habitat since it is essentially an unconsolidated unstable rock rubble area subject to high wave energy which negatively effects coral growth and reproduction. Ecosystem function of Type D habitats includes production of biomass consumed by reef associated organisms which supports the trophic structure of the reef and hard bottom communities. Off-reef foraging of reef associated fishes and invertebrates transports production from the soft substrate systems to the reef and hard bottom communities. While temporary impacts to these communities recovers within 3-4 years, permanent conversion of these habitats to hard substrate by laying pipe and concrete mat on the seabed in depths less than 200' creates a loss of ecological function to the ecosystem (Wilber and Stern, 1992). This conversion of Type D habitat to a hard substrate community may change the trophic structure of the nearshore ecosystem in the vicinity of the Port Everglades Entrance Channel. Impacts to this component of the nearshore marine ecosystem should be addressed in the evaluation of impacts and mitigation necessary to protect ecosystem function and structure. Protocols for mitigation of seagrass impacts are explicit in the regulatory Basis of Review and are therefore not included in this matrix.

Quantifying Mitigation-

Baseline Replacement Value = 8

Value/function Habitat Type Adjustment	Type A: 0	Type B: -1	Type C: -3	Type D: -4

Special Designation: Yes= +1 No = 0
(Outstanding Florida Waters, Aquatic preserves, etc.)

Time Lag (years) > or = 35: +1 11 to 34: 0 6 to 10 years: -1.0
0 to 5 years: -2.0

Success Probability	high: -1.0	average: 0	low: + 1.0
On-site vs. off-site	on-site 0	off-site +1.0	

Rationale for the 5 evaluation factors (Section 4.3.2.1 of the Basis of Review):

The Basis of Review specifies certain factors to be considered, however, it does not designate a higher or lower importance to any specific factor. Therefore, we considered all factors equally and set adjustments in single value increments.

Baseline replacement value: The beginning base replacement of 8 was assigned based on the mean of mitigation ratios applied to previously permitted projects requiring mitigation. Mitigation requirements for the previously permitted/licensed projects impacting reef and hard bottom resources in habitats similar to those observed off Broward County provided reasonable assurances that lost spatial and temporal ecosystem structure and function would be adequately mitigated.

Value/function: This factor was evaluated based on the abundance, uniqueness and functional value of each habitat type. For further descriptions of each habitat type, please refer to the habitat characterization section.

Habitat Type Adjustment Rationale
Type A= 0 Includes reef systems and high relief hard bottoms, which are essential fish habitat and habitat areas of particular concern, high diversity, higher economic value, high habitat value.

Type B= - 1 Moderate occurrence, essential fish habitat and habitat areas of particular concern, medium diversity, hard substrate provides colonization of organisms, medium to high habitat value

Type C= - 3 Breakwater Spoil Area, essential fish habitat and habitat areas of particular concern

Type D= - 4 Commonly occurring, low epi-benthic coverage, sandy veneer over hard bottom

Special Designation: This factor was evaluated based on special designation or classification of the affected area Not located within a specially designated or classified area = 0; Located within a specially designated or classified area = + 1.

Time Lag: Time lag is defined as the length of time expected to elapse before the functions of the area adversely impacted will be offset. The time lag for coral reefs systems is expected to be very high, possibly up to 100 years.

Based on input from applicants and experts in marine ecology as well as interagency consultations regarding recovery rates of various biological components of southeast Florida nearshore marine communities, the following time lag categories and adjustments were developed using best professional judgment:
>35= +1.0; **11 to 35**= 0; **5 to 10**= -1.0 **0 to 5**= -2.0

(Note: this does not include adjustments for organism relocation to the impact area as that is accounted for in the success probability.)

Success Probability:

The probability of success addresses the uncertainties associated with reasonable assurance that proposed mitigation will successfully replace lost ecosystem structure or function resulting from impacts to important resources. Categories and adjustments were selected using professional judgment in consultation with resource management and regulatory agencies. This factor was evaluated using criteria such as organism transplantation, supporting documentation of mitigation success, special projects, recovery of impact area, etc.

Success Probability Adjustment Rationale

Low= +1.0: No transplanted organisms, no supporting literature for success of mitigation type, no recovery of impact area expected

Medium= 0: Only hard coral transplantation, minimal supporting literature, partial recovery of impact area expected

High= - 1.0: Transplanting hard corals > or = 25 cm in diameter, soft corals > 25 cm in height and rubble colonized with hard coral and octocorals; Agency preferred special mitigation projects; sufficient supporting literature, recovery of impact area

On-site vs. off-site: Mitigation which is within close proximity to the impact area is usually preferred mitigation over that which is not in close proximity. In certain circumstances, such as tire removal, mitigation was determined on-site regardless of the distance from the impacts since second reef/sand impacts will be mitigated by the enhancement of second reef/sand resources.

On-site 0 Within close proximity to the impact area or an agency recommended area
Off-site + 1 Not within close proximity to the impact area

Conclusion:

The interagency group concluded that methodology proposed under the Regulatory Basis of Review Mitigation Protocol will provide reasonable assurances that lost ecosystem structure and function will be replaced.

Mitigation Credit for Tire Recovery and Reef Enhancement

Tire Recovery:

In the 1970s and 1980s, bundled automobile tires were placed between the second and third reefs offshore of Broward County as artificial reefs. Due to instability and separation of the bundles, the tires have moved to the west and are now impacting the second reef. The proposed enhancement area is being adversely impacted by these tires that have moved onto important habitats similar to the resources expected to be impacted by projects proposed in this area. This situation provides a unique opportunity to enhance previously impacted natural reef, hard bottom and important soft substrates in the vicinity for projects with similar types of impacts (low relief hard bottom, Intra-reef sand areas, etc.) Determining appropriate mitigation credit for the removal, transportation to shore and approved disposal of the tires recovered from the enhancement/restoration area has been the subject of extensive interagency coordination. This document represents the conclusions and rationale for the decisions resulting from these interagency discussions.

Description of the Proposed Enhancement Area

Broward County staff conducted video surveys in June 2003, to define the areal extent of the tire field and characterize the impacts at the proposed enhancement site. Video records were geo-referenced using a Hypac system to allow integration into Geographic Information System (GIS) software. Results of the video surveys showed a total of 31.0 acres of nearshore marine habitats were impacted by tires. Approximately 17.0 acres are covered by more than one layer of tires, and 14.0 acres were observed to be covered continuously with a single layer. Areas of scattered or intermittent tires extend beyond this mapped tire pile.

Based on results of the video surveys, agency staff conducted dive operations to (1) characterize the hard bottom under tires; (2) determine the number of layers of tires in the multi-layer area; and (3) describe the eastern side of the tire pile, near the third reef. The location of and observations made from these dives were included on the GIS output from the video survey to describe the enhancement/restoration area (Figure 1). Results of this survey indicated a total of 2.1 acres of hard substrate was covered by tires. The multi-layer area varies from two to seven tires deep, with the highest density between transects 4 and 7 (Figure 1). Observations made along transect 13, located on the east side of the main tire pile, showed intact tire bundles that appear to be stable with large Scleractinian corals growing on some of the bundles. Relocation of these corals will be required if these tire bundles are to be removed.

Tire densities

The area covered by one tire is calculated to be to be 3 square feet and one acre totals 43,560 square feet. To determine the number of tires contained in one acre of a single layer of tires, divide 43,560 by 3 to calculate an estimated 14,520 tires per acre. Assuming an average of three layers of tires over the multi-layer area of 17.0 acres, there is an estimated 740,520 tires in the multi-layer area. The single layer area (14.0 acres) is estimated to include 203,280 tires.

Recovery Approach

Observations of net transport along the seafloor, surveys conducted by Broward County and empirical observation following previous tire recovery efforts have shown that tires in this area have been observed to move from the east/northeast to the west/southwest by storm waves and currents. Priority areas were defined to promote maximum restoration of the reef, hard bottom and surrounding soft substrate components of the system. Tire recovery efforts and enhancement activities should begin on the northern extent of the multi-layer portion of the area and move toward the south (Figure 2) and should be conducted in the following order:

1. Priority Area 1: Multi-layer tire area starting on the north and progressing to the south;
2. Priority Area 2: Single layer tire area north of the multi-layer area;
3. Priority Area 3: Single layer tire area south of the multi-layer area; and
4. Priority Area 4: Tires and bundles of tires east of the multi-layer area.

The specific details regarding the locations and requirements of recovery and restoration activities, including latitude/longitude of corner locations of the tire recovery areas, set-backs and buffers from important resources, Best Management Practices, GPS vessel monitoring systems and turbidity and sedimentation monitoring requirements will be provided through permit conditions.

Mitigation Credit

Regulatory and management agency staff agreed that one unit of mitigation would equal the removal, transport to shore and disposal of one acre or 14,520 tires from the restoration/enhancement area. One acre of required conventional mitigation equals one unit of tire recovery mitigation. Based on the video and diver surveys of the tire areas, the average tire depth within the multi-layer area is three tires deep. Therefore, in multi-layer areas, the actual area covered in the tire recovery mitigation activities would be less than the area of conventional mitigation required. For example, one acre of tires recovered from the Priority Area 1 (assumed to be three layers thick) would involve removal of approximately 43,560 tires. Three units of mitigation (3 acres of conventional mitigation) would be credited for clearing this one acre multi-layer area. Whereas, the recovery of one acre of tires in the single layer area will equate to one unit of mitigation (removal of 14,520 tires).

The locations and dimensions of the tire recovery areas will be defined in permit conditions based on the number of units required for a project using tire recovery as mitigation. The removal of tires must be performed in a manner that clears the entire defined area of tires. For example, removal of the top two layers of tires and leaving the third layer of tires in a multi-layer area will not be considered acceptable even if the required number of tires is removed. As an assurance that the required number of tires are removed, a verified copy of the disposal logbook kept by the landfill detailing the date of delivery and number of tires for each truckload and a receipt from the landfill will be required.

Methods of Tire Recovery

It is recognized that there may be a variety of innovative construction techniques used to achieve the goal of tire removal. Each applicant will present their preferred method of recovery for agency evaluation. Reasonable assurances must be provided that the proposed methodology will meet water quality and sedimentation standards applied to the impact site and not cause adverse impacts to marine resources.

Several agencies expressed concerns regarding the potential for increased sedimentation and turbidity, as well as inadvertent impacts to benthic resources and artificial reefs located in the tire field, from mechanical tire recovery. To address this concern, a setback/buffer distance from these resources will be established where diver recovery will be required to reduce the risk of physical damage or sedimentation and turbidity impacts to reef and hard bottom resources associated with mechanical removal. The setback will be evaluated based on evaluation of the risks associated with the means of mechanical recovery.

Tire recovery from Priority Area 4 includes the need to relocate Scleractinian corals before tire bundles are disturbed. An agency developed detailed relocation plan and an appropriate mitigation discount to account for coral relocation will be established prior to tire removal from Priority Area 4.

Monitoring

Monitoring of the enhancement/restoration area is needed to document (1) the status of the resources when the mitigation is complete; (2) the recovery and movement of tires; (3) the enhancement/restoration of the resources over time; and (4) planning for future recovery and restoration efforts. It is recommended that the permit holders provide funds for a holistic monitoring program to Broward County DPEP. The DPEP will administer and oversee the monitoring program and provide copies of monitoring reports to the other agencies issuing permits for the proposed projects. Appropriate funding levels for monitoring should be developed in consultation with applicants and agency staffs involved in the tire recovery and reef enhancement activities.

References:

Florida Department of Environmental Protection (2003) Submerged Lands & Environmental Resources Program Operations and Procedures Manual

Florida Department of Environmental Protection (1995). Basis of Review For Environmental Resource Permit Applications Within The South Florida Water Management District. August 1995.

Johns, Grace M.; Vernon R. Leeworthy; Frederick W. Bell and Mark A. Bonn. 2001. Socioeconmomic Study of Reefs in Southeast Florida Final Report. Hazen and Sawyer.

Southeast Florida Action Strategy Team (2003). Southeast Florida Coral Reef Initiative, Local Action Strategies. United States Coral Reef Task Force.

Wilber, P., and M. Stern. (1992.) A re-examination of infaunal studies that accompany beach renourishment projects. *In* S. Tait (ed.), Proceedings of the 5th Annual Conference on Beach Preservation Technology, p. 242-257. Florida Shore and Beach Preservation Association, St. Petersburg, Florida

Biological Resources	
54	Page 4-94 indicates that biocides would be used in cooling water. The application does not address the impacts of biocides. Please provide information on the type and concentration of biocides to be used, including toxicity data and discharge modeling and associated impacts.
Response	The cooling water discharged from the SRVs will not contain biocides. There would be a marine growth prevention system on board the SRV for ballast water treatment, but this system would not be used while at the buoy site (as indicated in Volume II, Figure 4-19).

Biological Resources	
55	The Asian green mussel was found to occur at the Project Area (see page 4-22). Please describe measures to be taken to avoid the spread of non-native species in ballast water after SRVs leave the Port.
Response	The Asian green mussels were observed in Tampa Bay proper, but were not observed offshore. The SRVs will not enter Tampa Bay. In addition, the ballast water taken in by the SRVs will be treated with 0.2 ppm of sodium hypochorite which will ensure that there will not be a spread of non-native species when and where the ballast water is released outside of the project area. No ballast water will be released while the SRV is connected to the buoy.

Biological Resources	
56	The full citations for the following references weren't provided in the reference list in Section 13. Please provide the full citation and the an electronic copy of the references: 1. FMRI 1999 2. McMichael and Taylor 1990 3. Smith 1979 4. Cobb and Lawrence 2003 5. Lyons and Collard 1974 6. Lyons and Camp 1982 7. Bell and Devlin 1983 8. Dawes et al 1967 9. Dawes and VanBreedveld 1969 10. Dawes and Lawrence 1990 11. Cobbs and Lawrence 2003 12. Holland et al 1990 13. Higashi 1994
Response	1. FMRI 1999 Florida Marine Res. Inst. 1999. J.M. Fine and R.F. Heagey. In house Report Series IHR 1999-006. Fisheries-independent monitoring program: Summary of trawl sampling in Tampa Bay, Florida 1989-1997. 2. McMichael and Taylor 1990 This is incorrect author reference. It should be Murphy and Taylor 1990. Murphy, M.D. and R.G. Taylor, 1990. Reproduction, growth, and mortality of red drum *Sciaenops ocellatus* in Florida Waters. Fish. Bull., U.S., 88, 531-542.3. Smith 1979 3. Smith 1979 This is an incorrect author reference. It should be Smith 1976 included in Section 13. Smith, G.B. 1976. Ecology and distribution of eastern Gulf of Mexico reef fishes. Fla. Mar. Res. Publ. No. 19. 4. Cobb and Lawrence 2003 Cobb, J.C. and J.M. Lawrence. (2003). Seasonal and spatial variation in algal composition and biomass on the central Florida Gulf-coast shelf. Gulf Mex. Sci. 21:192-201. 5. Lyons and Collard 1974 Lyons, W.G. and S.B. Collard. 1974. Benthic invertebrate communities of the eastern Gulf of Mexico. In: R.E. Smith (eds.) Proceedings of marine environmental implications of offshore drilling in the eastern Gulf of Mexico. State Univ. Syst. Fla. Inst. Oceanogr., St. Petersburg, Florida. Pp. 157-166. 6. Lyons and Camp 1982 Lyons, W.G. and D.K. Camp. 1982. Zones of fauna1 similarity within the hourglass study area. In: Proceedings third Annual Gulf of Mexico Information Transfer Meeting - Dec. 1982. U.S. Dept. Inter./Minerals Management Service. 7. Bell and Devlin 1983 Bell, S.S. and D.J. Devlin. 1983. Short term macrofaunal recolonization of sediment and epibenthic habitats in Tampa Bay, Florida. Bulletin of Marine Science 33:102-110.

	8. Dawes et al 1967 Dawes C.J., S.A. Earle, and F.C. Croley. 1967. The offshore benthic flora of the southwest coast of Florida. Bulletin of Marine Science 17:211-231. 9. Dawes and VanBreedveld 1969 Dawes, C.J., and J.F. van Breedveld. 1969. Benthic Marine Algae. Memoirs of the Hourglass Cruises 1:1–30. 10. Dawes and Lawrence 1990 Dawes, C.J. and J.M. Lawrence. 1990. Seasonal changes in limestone and sand communities off the Florida west coast. *Pubblicazioni della Stazione zoologica di Napoli I: Marine Ecology* 11:97–104. 11. Cobbs and Lawrence 2003 This appears to be a duplication of item 4 above. 12. Holland et al 1990 Holland K.N., R.W. Brill, and R.K.C. Chang. 1990. Horizontal and vertical movements of yellowfin and bigeye tunas associated with Fish Aggregating Devices. Fish. Bull. 88, 493-507. 13. Higashi 1994 Higashi G.R. 1994. Ten years of fish aggregation device (FAD) design development in Hawaii. Bull. Mar. Sci. 55(2-3). Pp. 651-666.

Biological Resources	
57	Please provide the following references: 1. Ash and Runnels 2005 2. Bullock and Smith 1991 3. Coleman and Williams 2002 4. Hatchett et al. 2006 5. Hopkins 1982 6. Hopkins et al 1981 7. Houde 1977 a, b, c 8. Houde 1982 9. Houde et al. 1979 10. Houde and Lovdal 1984 11. Hueter and Tyminski 2006 12. Mann et al. 2007 13. McMichael et al. 1995 (cited as 1996 on page 4-11 and 1995 in Section 13) 14. Parker et al. 1983 15. Phillips et al. 1990 16. Pierce and Mahmoudi 2001 17. Pierce et al. 1998 18. Rettig and Snyder 2005a 19. Rettig and Snyder 2005b 20. Robison 1982 21. Ross 1983 22. Saloman and Naughton 1979 23. Steidinger 1973 24. Steidinger et al. 1998 25. Taylor et al. 1998 26. Vargo and Hopkins 1990 27. Vargo et al. 1987
Response	1. Ash and Runnels 2005 The year in the List of Citations is incorrect it should be 2003, same as text reference year. Also, incorrect initial for Runnels – should be R. Runnels, not A. Runnels. The reference should be: ASH, T. and R. RUNNELS, 2003. Hard Bottom Habitats: An Overview of Mapping and Monitoring Needs on Epibenhtic Communities in Tampa Bay. *In:* S.F. Treat ed.. Proceedings, *Tampa Bay Area Scientific Information Symposium*, BASIS4: 27–30 October 2003, St. Petersburg, Florida, 295 pp., 179-181.

2. Bullock and Smith 1991

The reference is included in Volume II, Section 13 and is:

BULLOCK, L.H. and G.B. SMITH, 1991. Seabasses (*Pisces:Serranidae*). *Mem. Hourglass Cruises*, 8 (2), 1-243.

3. Coleman and Williams 2002

The reference is included in Volume II, Section 13 and is:

COLEMAN, F.C. and S.L. WILLIAMS, 2002. Overexploiting Marine Ecosytem Engineers: Potential Consequences For Biodiversity. *Trends in Ecol. Evol.*, 17 (1), 41-44.

4. Hatchett et al. 2006

The reference is included in Volume II, Section 13 and is:

HATCHETT, L., A. NIEDORODA, T. CAMPBELL, J. ANDREWS, M. LARENAS, C. FINKL, and L. BENEDET, 2006. *Reconnaissance Offshore Sand Search of the Florida Southwest Gulf Coast*. Unpublished report prepared for the Florida Department of Environmental Protection, Bureau of Beaches and Coastal Systems by URS Corporation and Coastal Planning and Engineering Inc. 143 pp.

5. Hopkins 1982

The reference is included in Volume II, Section 13 and is:

HOPKINS, T.L., 1982. The Vertical Distribution of Zooplankton in the Eastern Gulf of Mexico. *Deep-Sea Research*, 29A, 1,069-1,083.

6. Hopkins et al 1981

The reference is included in Volume II, Section 13 and is:

HOPKINS, T.L., D.M. MILLIKEN, L.M. BELL, E.J. MCMICHAEL, J.J. HEFFERNAN, and R.V. CANO, 1981. The Landward Distribution of Oceanic Plankton and Micronekton Over the West Florida Continental Shelf As Related to Their Vertical Distribution. *Journal of Plankton Research* 3, 645-658.

7. Houde 1977 a, b, c

The reference is included in Volume II, Section 13 and is:

HOUDE, E.D., 1977a. Abundance and Potential Yield of the Round Herring, *Eutremeus teres*, and Aspects of Its Early Life History In the Eastern Gulf of Mexico. *Fishery Bulletin, U.S.*, 75, 61-89.

HOUDE, E.D., 1977b. Abundance and Potential Yield of the Atlantic Thread Herring, *Opisthonema oglinum*, and Aspects of Its Early Life History In the Eastern Gulf of Mexico. *Fishery Bulletin, U.S.*, 75, 493-512.

HOUDE, E.D., 1977c. Abundance and Potential Yield of the Scaled Sardine, *Harengula jaguana*, and Aspects of Its Early Life History In the Eastern Gulf of Mexico. *Fishery Bulletin, U.S.*, 75, 613-628.

8. Houde 1982

The reference is included in Volume II, Section 13 and is:

HOUDE, E.D., 1982. Kinds, Distributions and Abundance of Sea Bass Larvae (Pisces: Serranidae) From the Eastern Gulf of Mexico. *Bulletin of Marine Science*, 32 (2), 511-522.

9. Houde et al. 1979
The reference is included in Volume II, Section 13 and is:
HOUDE, E.D., J.C. LEAK, C.E. DOWD, S.A. BERKELEY, and W.J. RICHARDS, 1979. Ichthyoplankton Abundance and Diversity in the Eastern Gulf of Mexico. *In:* U.S. Department of Commerce, Report to the Bureau of Land Management, National Technical Information Service, PB-299839, xxxii + 546 pp.

10. Houde and Lovdal 1984
The reference is included in Volume II, Section 13 and is:
HOUDE, E.D. and J.A. LOVDAL, 1984. Seasonality of Occurrence, Foods and Food Preferences of Ichthyoplankton in Biscayne Bay, Florida. *Estuar. Coast. Shelf Sci.* 18, 403-419.

11. Hueter and Tyminski 2006
The reference is included in Volume II, Section 13 and is:
HUETER, R. and H. TYMINSKI, 2006. Species specific distribution and habitat characteristics of shark nurseries in Gulf of Mexico waters off peninsular Florida and Texas. *American Fisheries Society Symposium*, in press.

12. Mann et al. 2007
The reference is included in Volume II, Section 13 and is:
MANN, D., G. BAUER, D. COLBERT, J. GASPARD, AND REEP, 2007. Sound Localization Abilities of the West Indian Manatee. Final Report. Prepared for the State of Florida Fish and Wildlife Conservation Commission. January 2007. Project FWC 03/04-28. 56 pp.

13. McMichael et al. 1995
The reference year is cited incorrectly in text as 1996 (should be 1995) and is included in Volume II, Section 13 as noted below:
MCMICHAEL, R. H. JR., R. PAPERNO, B. J. MCLAUGHLIN, AND M. E. MITCHELL. 1995. Florida's marine fisheries-independent monitoring program: a long-term ecological dataset. *Bull. Mar. Sci.* 57:282.

14. Parker et al. 1983
The reference is included in Volume II, Section 13 and is:
PARKER, Jr., R.O., D.R. COLBY, and T.D. WILLIS, 1983. Estimated Amount of Reef Habitat on a Portion of the U.S. South Atlantic and Gulf of Mexico Continental Shelf. *Bulletin of Marine Science*, 33 (4), 935-940.

15. Phillips et al. 1990
The reference is included in Volume II, Section 13 and is:
PHILLIPS, N., D. GETTLESON, and K. SPRING, 1990. Benthic Biological Studies of the Southwest Florida Shelf. *Amer. Zool*, 30, 65-75.

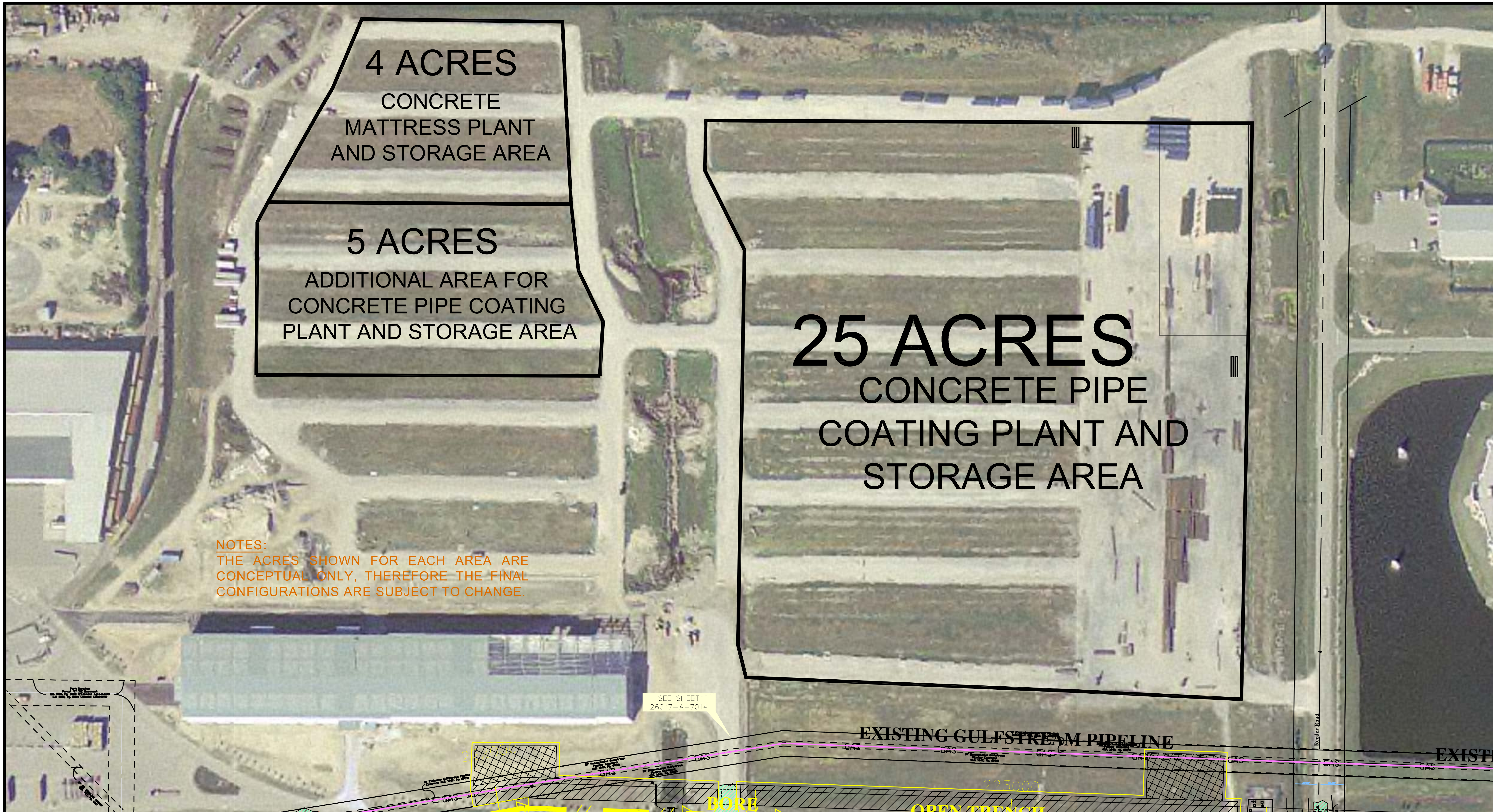
16. Pierce and Mahmoudi 2001
The reference is included in Volume II, Section 13 and is:
PIERCE, D.J. and B. MAHMOUDI, 2001. Nearshore Fish Assemblages Along the Central West Coast of Florida. *Bull. Mar. Sci.*, 68 (2), 243-270.

	17. Pierce et al. 1998 The reference is included in Volume II, Section 13 and is: PIERCE, D.J., J.E. WALLIN, and B. MAHMOUDI, 1998. Spatial and Temporal Variations in the Species Composition of Bycatch Collected During as Striped Mullet (*Mugil cephalus*) Survey. *Gulf of Mexico Science*, 1, 15-27. 18. Rettig and Snyder 2005a The reference is included in Volume II, Section 13 and is: RETTIG. A. and B. SNYDER, 2005a. Memorandum to Ashley Allen, USEPA. *A summary of ichthyoplankton presence and abundance, as part of an assessment of the Potential for Entrainment by Offshore Oil and Gas Facilities*. 19. Rettig and Snyder 2005b The reference is included in Volume II, Section 13 and is: RETTIG, A. and B. SNYDER, 2005b. Memorandum to Ashley Allen, USEPA. *A Summary of Fish Egg Presence and Abundance in the Gulf of Mexico, as Part of an Assessment of the Potential for Entrainment by Offshore Oil and Gas Facilities*. 20. Robison 1982 The reference is included in Volume II, Section 13 and is: ROBISON, D.E., 1982. Variability in the vertical distribution of ichthyoplankton in lower Tampa Bay, Florida. *In*: *Proceedings of the Bay Area Scientific Information Symposium*, 2-6 May 1982. Tampa, FL: Univ. of S. FL. 21. Ross 1983 The reference is included in Volume II, Section 13 and is: ROSS. S.T., 1983. A Review of Surf Zone Ichthyofaunas in the Gulf of Mexico. *In:* SHABICA, S.V., COFER, N.B., AND CAKE, E.W. Jr. (eds.). *Proceedings of the northern Gulf of Mexico Estuaries and Barrier Islands Research Conference.* Atlanta, Georgia: U.S. DOI, National Park Service, Southeast Regional Office, 25-34. 22. Saloman and Naughton 1979 The reference is included in Volume II, Section 13 and is: SALOMAN, C.H. and S. P. NAUGHTON, 1979. Fishes of the Littoral Zone, Pinellas County, Florida. *Fla. Sci.*, 42 (2), 85-93. 23. Steidinger 1973 The reference is included in Volume II, Section 13 and is noted below. The author's name, however, is misspelled in text (should be Steidinger not Steindinger). STEIDINGER, K.A., 1973. Phytoplankton Ecology: a conceptual review based on eastern Gulf of Mexico Research. *CRC Crit. Rev. Microbiol*., 3, 49-68. 24. Steidinger et al. 1998 The reference is included in Volume II, Section 13 and is: STEIDINGER, K.A., G.A. VARGO, P.A. TESTER, and C.A. THOMAS, 1998. Bloom dynamics and physiology of *Gymnodinium breve* with emphasis in the Gulf of Mexico. *In:* Anderson, D.M., Cembella, A.D., and Hallegraeff, G.M., eds. *Physiological Ecology of Harmful Algal Blooms.* NATO ASI Series Vol. G 41. Berlin:Sprinter-Verlag.

	25. Taylor et al. 1998 The reference is included in Volume II, Section 13 and is: TAYLOR, R.G., H.J. GRIER, and J.A. WHITTINGTON, 1998. Spawning Rhythms of Common Snook in Florida. *J. Fish. Biology,* 53, 502-520. 26. Vargo and Hopkins 1990 The reference is included in Volume II, Section 13 and is: VARGO, G.A., and T.L. HOPKINS, 1990. Plankton. *In:* N.W. PHILLIPS and K.S. LARSON (eds.). *Synthesis of Available Biological, Geological, Chemical, Socioeconomic, and Cultural Resource Information for the South Florida area*. OCS Study MMS 90-0019. U.S. Department of the Interior, Minerals Management Service, Atlantic OCS Region, Herndon, VA, 195-230. 27. Vargo et al. 1987 The reference is included in Volume II, Section 13 and is: VARGO, G.A., K.L. CARDER, W. GREGG, E. SHANLEY, C. HEIL, K.A. STEIDINGER, and K. HADDAD, 1987. The potential contribution of primary production by red tides to the West Florida shelf ecosystem. *Limnol. Oceanogr*. 32, 762-767.

Biological Resources	
58	Please provide the raw and reduced SEAMAP data (including the supporting documentation, e.g., date, source, and data analysis). Data should be reduced as specified in the Ichthyoplankton Impact Assessment Model, Appendix G to the Gulf Landing Final Environmental Impact Assessment and Appendix E-1 of the Main Pass Energy Hub™ Final EIS. Data should be reduced for the four representative species, Red Drum, Red Snapper, Bay Anchovy, and Gulf Menhaden. Egg densities should be based on the SEAMAP data collection stations near the project area rather than Gulf-wide densities.
Response	The SEAMAP data was obtained from Mark Leiby with FWRI, FWC. The fish data has been reduced as specified; however, there is no egg density data available. The Excel file containing the reduced SEAMAP data has been placed on an FTP for download.

Biological Resources	
59	On Page 1-34, a temporary concrete coating and concrete block fabrication facility is discussed. Please provide an assessment of the impacts of this facility on terrestrial biological resources.
Response	As indicated in Volume II, Section 10.3.5, the temporary concrete coating and concrete block fabrication facility will be located at Port Manatee in a location where similar activities occurred during the installation of the Gulfstream pipeline. This area is currently a combination of concrete pads and mowed grasses and located in the industrial area of the Port. The concrete block fabrication facility will require 4 acres and the pipe batch plant and storage will require 30 acres. There are no anticipated impacts on terrestrial biological resources. A figure has been attached that illustrates where this temporary area is proposed to be located.



NOTES:
THE ACRES SHOWN FOR EACH AREA ARE CONCEPTUAL ONLY, THEREFORE THE FINAL CONFIGURATIONS ARE SUBJECT TO CHANGE.

REFERENCE DRAWINGS

DWG. NO.	DESCRIPTION

REVISIONS

NO	DATE	DESCRIPTION
A	8/01/07	ISSUE FOR INFORMATION
B	8/31/07	ADDED ACREAGE FOR CONCRETE PLANT

PIPELINE ENGINEERING SOLUTIONS, INC.
13831 NORTHWEST FRWY. #312
HOUSTON, TEXAS 77040
BUS: (713) 690-9111
FAX: (713) 690-0060

DRAWING STATUS

ISSUED FOR	DATE	BY
BID		
CONST.		
AS- BUILT		

SCALE N/A
DRAWN EHF DATE 8/01/07
CHK'D DJR DATE 8/01/07
APPROVED DATE
PESI JOB NO. 26017
AFE/P.O.NO.
CLIENT FILE NO. 1088
PESI FILE NO. 26017-7801-B

HÖEGH LNG

TITLE
CONCRETE PLANTS & STORAGE AREAS
AT PORT MANATEE
PORT DOLPHIN PIPELINE
MANATEE COUNTY, FLORIDA

NO. 26017-B-7801
REV. B