REQUEST FOR AN INCIDENTAL HARASSMENT AUTHORIZATION UNDER THE MARINE MAMMAL PROTECTION ACT FOR THE BRAVO WHARF RECAPITALIZATION YEAR 2 AT NAVAL STATION MAYPORT, JACKSONVILLE, FLORIDA NAVY REGION SOUTHEAST

Submitted to:

Office of Protected Resources,
National Marine Fisheries Service,
National Oceanographic and Atmospheric Administration

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July 2017
Revised October 2017

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Table of Contents

List of Figures

List of Tables

List of Appendices

List of Acronyms

B	logarithmic loss
B-1	Berth Bravo One
B-2	Berth Bravo Two
B-3	Berth Bravo Three
BMP	best management practice
C	linear (scattering and absorption) loss
C-1	Wharf Charlie One
CFR	Code of Federal Regulations
CV	coefficient of variation
dB	decibel
dBA	decibel (A-weighted)
ft.	feet
FR	Federal Register
h	height
Hz	Hertz
in.	inch
km	kilometer
kHz	kiloHertz
µPa	microPascal
m	meter
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
MSDD	Marine Species Density Database
NAVFAC	Naval Facilities Engineering Command
NAVFAC SE	Naval Facilities Engineering Command, Southeast
n.d.	no date
NMFS	National Marine Fisheries Service
NS	Naval Station
POC	point of contact
PTS	permanent threshold shift
R_1	range from source in meters
R_2	range from driven pile to original measurement location
rms	root-mean-square
SPL	sound pressure level
SSP	steel sheet pile
TL	transmission loss
U.S.	United States
USFWS	United States Fish and Wildlife Service
W	width
YONAH	Years of the North Atlantic Humpback

Executive Summary

In accordance with the Marine Mammal Protection Act of 1972, as amended, the United States Navy is applying for an Incidental Harassment Authorization to continue recapitalization of Bravo Wharf at Naval Station Mayport, Jacksonville, Florida. Five species of marine mammals may be present within the waters surrounding Naval Station Mayport: the North Atlantic right whale (*Eubalaena glacialis*), the humpback whale (*Megaptera novaeangliae*), the bottlenose dolphin (*Tursiops truncatus*), the Atlantic spotted dolphin (*Stenella frontalis*), and the West Indian manatee (*Trichechus manatus*). These species may occur year-round with the exception of North Atlantic right whales, which are more likely to occur between November and April due to close proximity of calving waters. The West Indian manatee is regulated by the U.S. Fish and Wildlife Service and will be managed in compliance with the *Standard Manatee Conditions for In-water Work, 2011*; it is not considered in this application.

The National Marine Fisheries Service issued an Incidental Harassment Authorization on 9 August 2016, which was revised and re-issued on 14 February 2017 (Appendix A) for 370 incidental Level B takes of bottlenose dolphins resulting from pile driving activities associated with the recapitalization of Wharf Bravo. The period of the existing Authorization is 13 March 2017 to 12 March 2018. As of July 2017, the pile driving activities associated with the Year 1 Authorization are 18% complete,, and 15 Level B takes of bottlenose dolphins have been observed. By March of 2018, it is estimated that phase I of the project will be 100% complete, and phase II will be 60% complete.

For the Year 2 Authorization application, the Navy proposes completion of the second phase of installation of steel sheet piles as a part of the overall recapitalization project at Bravo Wharf. By 13 March 2018, there will be 234 piles remaining to be installed. The project may require up to 12 months for completion; in-water activities are limited to a maximum of 40 days. Delays in construction at Wharf C-2 caused the Bravo Wharf recapitalization schedule to shift; due to this delay, changes in berthing needs at Naval Station Mayport necessitate switching the order of construction phases. Phase I now consists of work at berth B-1; Phase II now consists of work at berths B-2 and B-3. All piles will be driven with a vibratory hammer. Impact driving will be a contingency employed only if vibratory methods are inadequate; a similar project completed at adjacent Wharf C-1 required impact pile driving on only seven piles.

The Navy used the updated criteria and thresholds issued by the National Marine Fisheries Service in July 2016 (81 FR 51693) for assessing the potential for hearing loss (including level A harassment in the form of PTS) from pile driving; behavioral criteria were not impacted by the updated thresholds, and so the methodology for assessing behavioral impacts (outlined in Chapter 6) has not changed (National Marine Fisheries Service 2005b, 2009). The Navy used the practical spreading loss equation for underwater sounds and empirically measured source levels from similar pile driving events within the Naval Station Mayport turning basin to estimate potential marine mammal exposures. Predicted exposures are described in Chapter 5. Shut-down procedures will ensure no Level A harassments (injury) would occur, but modeling predicted that 191 Level B harassments (behavior) may occur for bottlenose dolphins as a result of pile driving activities associated with the Bravo Wharf recapitalization project. Conservative assumptions

(including marine mammal densities) used to estimate the exposures have likely overestimated the potential number of exposures and their severity.

While the model predicts two Level B exposures for North Atlantic right whales, the Navy will use conservative mitigation and shutdown procedures to ensure that no right whales will be impacted during the course of this project.

Pursuant to the Marine Mammal Protection Act Section 101(a)(5)(D), the Navy submits this application to the National Marine Fisheries Service for an Incidental Harassment Authorization for the incidental taking of bottlenose dolphins during pile driving activities as part of Year 2 of the Bravo Wharf Recapitalization project between 13 March 2018 and 12 March 2019. Takes would be in the form of non-lethal, temporary harassment and are expected to have a negligible impact on these species. In addition, takes would not have an immitigable adverse impact on the availability of these species for subsistence use.

1. Description of Activities

A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals.

Pursuant to the Marine Mammal Protection Act (MMPA) Section 101(a)(5)(D), the Navy submits this application to National Marine Fisheries Service for an Incidental Harassment Authorization for the incidental, but not intentional, taking of marine mammal species during pile driving activities associated with Year 2 of the Bravo Wharf (berths B-1, B-2, and B-3) Recapitalization project (Project) at Naval Station (NAVSTA) Mayport between 13 March 2018 and 12 March 2019. The first year IHA for this project (issued 9 August 2016, revised 14 February 2017) was adjusted such that the period of applicability was 13 March 2017 to 12 March 2018 per communication with NMFS. 50 Code of Federal Regulations (CFR) 216.104 sets out 14 specific items that must be included in requests for take pursuant to Section 101(a)(5)(A) of the MMPA; those 14 items are represented by the 14 sections of this application.

1.1. Proposed Action

The proposed action is the recapitalization, or renovation, of Bravo Wharf, consisting of berths B-1, B-2, and B-3 at NAVSTA Mayport (Figure 1-1). A previous IHA, issued 9 August 2016 covered the first year of the recapitalization project, and included installation of 880 single sheet piles. Recapitalization activities include the replacement of the steel sheet pile bulkhead which ties into existing steel sheet pile structure, concrete fill between existing and new steel sheet pile bulkheads, concrete pile cap and concrete encasement of sheet pile, asphalt wharf deck paving, repairs electrical and mechanical shore utilities, area lighting and anti-terrorism/force protection (AT/FP) waterfront enclave facilities. In-water work is expected to be completed before 12 March 2019

The project includes the installation of approximately 880 single sheet piles, conducted in two phases. Due to schedule shifts and berth availability needs, the phases described in the original IHA have been switched. Phase I now includes berth B-1, and Phase II covers berths B-2 and B-3. Phase I (berth B-1) includes the installation of approximately 293 single sheet piles (146.5 pairs) over the course of approximately 36 days; averaging approximately 12 sheet pile pairs installed per day, and is expected to be completed before the expiration of the current IHA. Phase II (berths B-2 and B-3) includes the installation of approximately 585 single sheet piles (292.5 pairs) over the course of approximately 74 total (year 1 and year 2, combined) days, averaging approximately 12 sheet pile pairs installed per day. Of the 130 total days of installation, 110 days were reserved for vibratory driving and the remaining 20 days were reserved for contingency impact driving. During year 2, there will be a maximum of 40 days of pile driving – 30 days of vibratory driving and 10 days reserved for contingency impact driving.

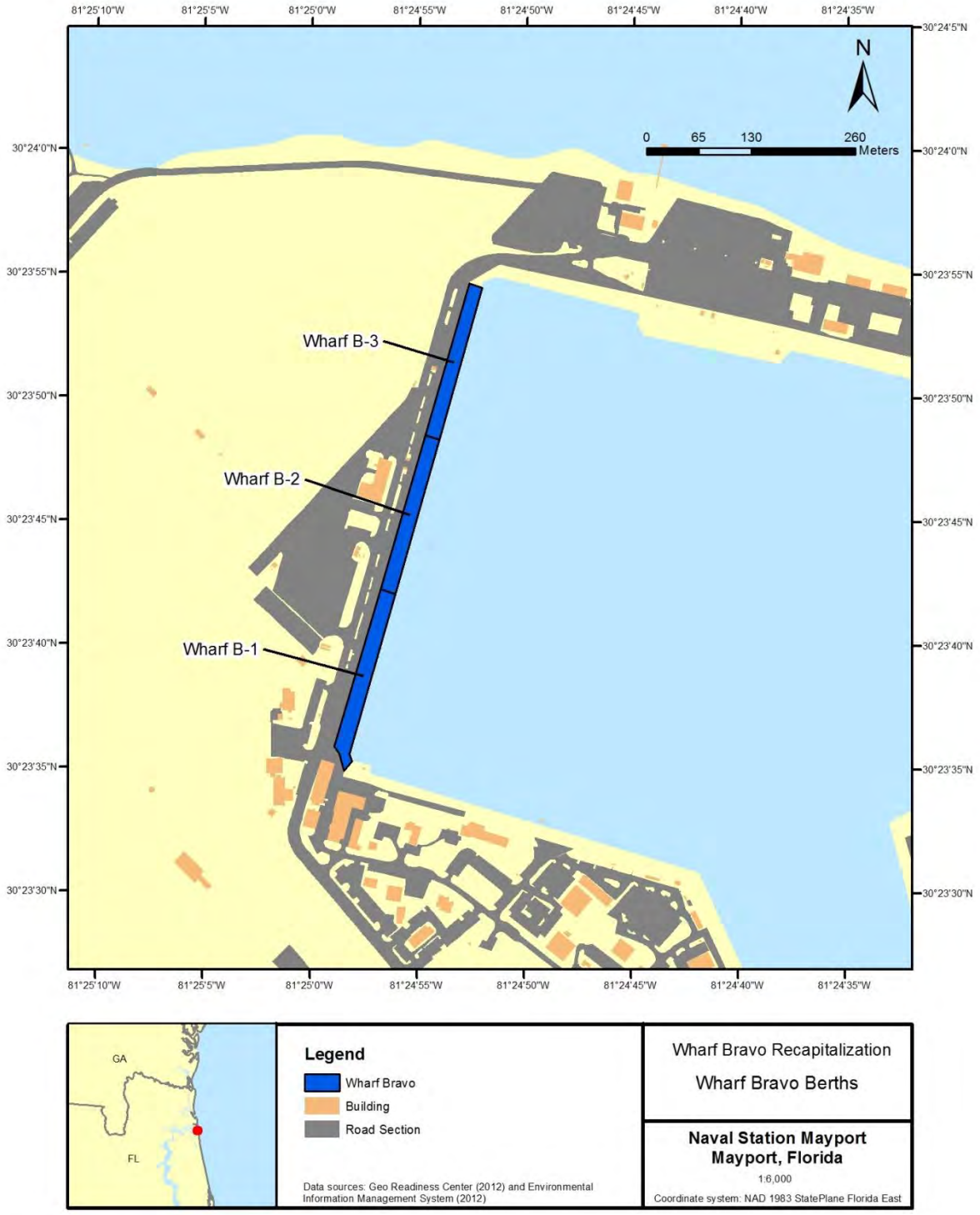
The use of impact driving shall be restricted to when vibratory driving is insufficient. A similar project that has been completed at adjacent Wharf C-1 required impact pile driving on only seven piles. Section 1.2 describes the elements of the proposed action in more detail.

As of July 2017, the following activities (see section 1.2 for details) have been completed:

- Cleaning of the existing pile cap
- Demolition of existing steam trench
- Minor demolition of the concrete cap

Before the end of the current IHA period, it is expected that all pile driving and associated activities for Phase I (B-1) will be complete, and that pile driving for Phase II (B-2 and B-3) will be approximately 60% complete (234 piles remaining).

FIGURE 1-1. BRAVO WHARF (BERTHS B-1, B-2, AND B-3) AT NAVSTA MAYPORT



1.2. Project Description

Bravo Wharf is a medium draft, general purpose berthing wharf that was constructed in 1970 and lies at the western edge of the NAVSTA Mayport turning basin. Bravo Wharf is approximately 2,000 ft long, 125 ft wide, and has a berthing depth of 50 ft mean lower low water. The wharf is one of two primary deep draft berths at the basin and is capable of berthing ships up to and including large amphibious ships; it is one of three primary ordnance handling berths at the basin. The wharf is a diaphragm steel sheet pile cell structure with a concrete apron, partial concrete encasement of the piling and asphalt paved deck.

Currently, the wharf is in poor condition due to the advanced deterioration of the steel sheeting and lack of corrosion protection. A major structural repair of the wharf is needed to maintain the long term serviceability of the structure because of widespread pitting and section loss of the steel sheet piles. Bravo Wharf berth two (B-2) has inadequate cold iron electrical capacity to support nesting of ships. Due to the structural deterioration of the wharf, load restrictions have been instituted that limit loads to a maximum of 4,500 pounds within 60 ft of the face of the wharf.

The Navy is working to install a new steel sheet pile bulkhead at Bravo Wharf. The wall will be anchored at the top and fill consisting of clean gravel and flowable concrete fill will be placed behind the wall. A concrete cap will be formed along the top and outside face of the wall to tie the entire structure together and provide a berthing surface for vessels. The new bulkhead will be designed for a 50-year service life.

Construction activities include:

- demolition of the existing concrete pile cap, wharf deck and utilities (including laterals and igloos);
- installation of a new steel combination wall with tieback anchors;
- placement of a combination of self-hardening fill, flowable fill, and clean fill between existing and new walls;
- installation of a new concrete cap which partially encases the new steel wall;
- installation of a sacrificial anode cathodic protection system for the new steel wall;
- installation of new foam filled fenders;
- installation of new utilities (including lateral supply lines from utilities such as water, fuel and electrical);
- repair of the wharf deck by milling and re-paving;
- replacement of lighting fixtures on galvanized steel standards; and
- replacement of security fencing

The following steps describe the construction sequence for placing the new SSP system in front of the existing deteriorated wall.

Preparation and Demolition

Existing underwater obstructions and debris (such as broken timber piles or segments of ship rails) interfering with the installation of the new SSP wall will be removed utilizing divers and cranes. The points where the new SSP is to attach to the existing sheet pile wall will be demolished above and below the waterline to expose the existing steel and any marine growth is removed from the existing wall. Along the face of the existing wall, the curb and a portion of existing concrete cap have been removed to accommodate the new concrete pavement will be placed between the new wall and the existing wall. The concrete apron along the waterside perimeter of the wharf and the utilities (including laterals and igloos) is in the process of being demolished as of July 2017. Utilities to be installed include water, steam, fuel, waste, electrical and communications.

Installation of a New Bulkhead

Shore based equipment and/or barges will be used to install piles. If barges are necessary, a crane barge with a pile installation suite (pile leads, vibratory hammer and an impact hammer) will mobilize to the project site with a material barge. Otherwise, cranes and materials will be based on shore adjacent to the installation sites. Piles will be driven to the appropriate depth using the vibratory driver. A total of approximately 878 single sheet piles (Phase I – berth B-1: 293 ; Phase II – berths B-2 and B-3: 585) will be installed. Figures 1-2 and 1-3 illustrate sheet piles as installed at NAVSTA Mayport. Impact pile driving would only be used as a contingency in cases when vibratory driving is insufficient (A similar project that has been completed at adjacent Wharf C-1 required impact pile driving on only seven piles). Once all of the piles are driven, closure plates will be attached between the existing adjacent sheet pile wall and the new wall end terminations. Typically, these are welded in place using underwater welding techniques.

In general, the pile-driving process begins by placing a choker cable around a pile and lifting it into vertical position with a crane. The pile is then lowered into position inside the template and set in place at the mud line. During vibratory driving, the pile is stabilized by the template while the vibratory driver installs the pile to the required tip elevation. Once piles are in position, vibratory installation would take less than 60 seconds to reach the required tip elevation. Time intervals between driving of each pile pair will vary, but will be a minimum of several minutes due to time required for positioning, etc.

Impact hammers have guides holding the hammer in alignment with the pile while a heavy piston moves up and down, striking the top of the pile, driving the pile into the substrate from the downward force of the hammer.

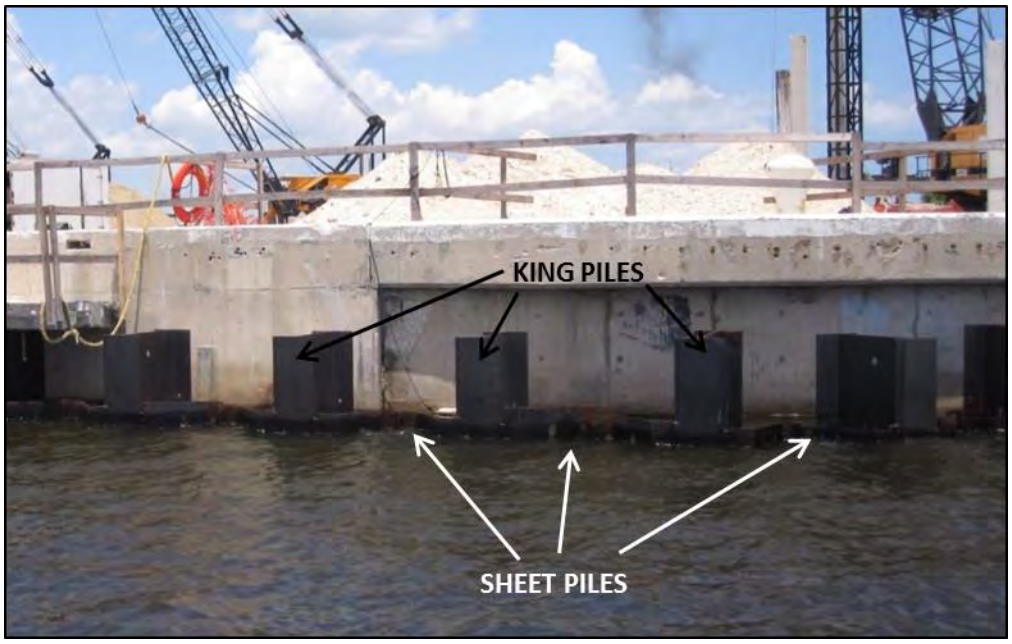
Installation of Anchors

There are multiple types of anchoring systems utilized for a sheet pile wall, including a grouted soil anchor system and a tie back wall system. Anchor rods will be installed from the new SSP wall to the anchor system. This requires drilling through the old wall to the anchor location behind the wall. In general, this anchor location may lie 40-60 feet behind (shoreward) the existing wall. After the anchor holes are driven, the anchors are placed in the holes and either the end of the anchor is grouted into the soil or the end of the anchor is attached to the tie back wall

system. The tie back wall system normally consists of sheet piles of shortened lengths that are buried below grade.

FIGURE 1-2. VIBRATORY INSTALLATION OF SHEET PILE AT NAVSTA MAYPORT

FIGURE 1-3. SHEET PILES AT NAVSTA MAYPORT



Placement of Fill

After the anchors are installed, fill operations will be conducted behind the new wall. This consists of placing either gravel fill or concrete flowable fill into the space behind the wall; trapped water behind the wall would be displaced.

Form and Placement of Pile Cap

After the fill operation is completed, the concrete pile cap will be formed and placed along the top of the new SSP wall. This consists of installing either wood or steel forms along the top of the wall down to some point below mean low water elevation. Water would be removed from the forms, steel reinforcement would be placed in the forms, and concrete would be poured to the required elevations.

Deck and Utility Placement

After the pile cap is in place, a new reinforced concrete apron will be installed and the wharf deck repaired by milling and paving. A new high mast lighting system, new security fencing, and new utilities will be installed to replace those that were removed.

Summary

Year 2 of the Project will entail installation of the remaining sheet piles. This includes approximately 234 single sheet piles, requiring a maximum of 30 days of in-water vibratory pile driving work conducted over a 12-month period. Impact pile driving would only be used as a contingency in cases when vibratory driving is insufficient (A similar project that has been completed at adjacent Wharf C-1 required impact pile driving on only seven piles). Ten days have been conservatively allotted for contingency impact driving even though only two days of impact pile driving occurred during the adjacent Wharf C-1 project. Impact pile driving, if it were to be necessary, could occur on the same day as vibratory pile driving, but driving rigs would not be operated simultaneously. Because activities are for the repair of existing facilities only, no increase in level of use or operation is expected. No net change in the amount of vessel traffic in and around the turning basin is expected as a result of the project.

TABLE 1-1. DAYS OF IN-WATER WORK PROJECTED IN YEAR 2 IHA [1]

Pile Driving Method	PI (B-1)	PII (B-2 and B-3)
Vibratory Hammer	0 days (100% complete)	30 days (60% complete)
Impact Hammer - Contingency	0 days (100% complete)	10 days
Total	**40 days**	

[1] Due to changes in berthing needs and schedule delays, berths B-2 and B-3 have been moved to Phase II of the 2017 IHA application, and Phase I started with berth B-1

2. Location and Duration of Activities

The dates and duration of such activity and the specific geographical region where it will occur.

NAVSTA Mayport is located in northern Florida, east of Jacksonville and adjacent to the St. Johns River and the Atlantic Ocean (Figure 2-1). Ship berthing facilities are provided at 16 locations along wharves A through F around the turning basin perimeter. The turning basin is approximately 2,000 by 3,000 feet in area, and is connected to the St. Johns River by a 500-ft-wide entrance channel. Bravo Wharf is located along the western edge of the Mayport turning basin (Figure 2–2).

The project area is defined as the immediate vicinity of Bravo Wharf, out to the limit of the most distant of the underwater threshold for all marine mammal species being addressed. The most distant underwater threshold is the marine mammal behavioral disturbance (120 dB re 1 µPa rms) threshold. Average underwater noise levels in the turning basin during 4 days in June 2015 were 128 dB rms. However, since this sample size is not necessarily representative of noise conditions in the basin year-round, the Navy has assumed that the background noise level is at the lowest measured level of 120 dB rms. The distance to the 120 dB threshold is therefore the maximum range at which the Navy expects to exert an environmental impact underwater, and represents a reasonable boundary for the project area (Figure 2-2).

The Project is currently in progress with 37.5% completion of Phase I (berth B-1). A maximum of 30 days of in-water vibratory pile driving work will take place over a 12-month period during the Year 2 of the project. Ten additional days were modeled in case contingency impact pile driving becomes necessary, but this duration is an extremely conservative estimate; a similar project that has been completed at adjacent Wharf C-1 required impact pile driving on only seven piles, which required just two days.

FIGURE 2-1. BRAVO WHARF PROJECT REGIONAL OVERVIEW

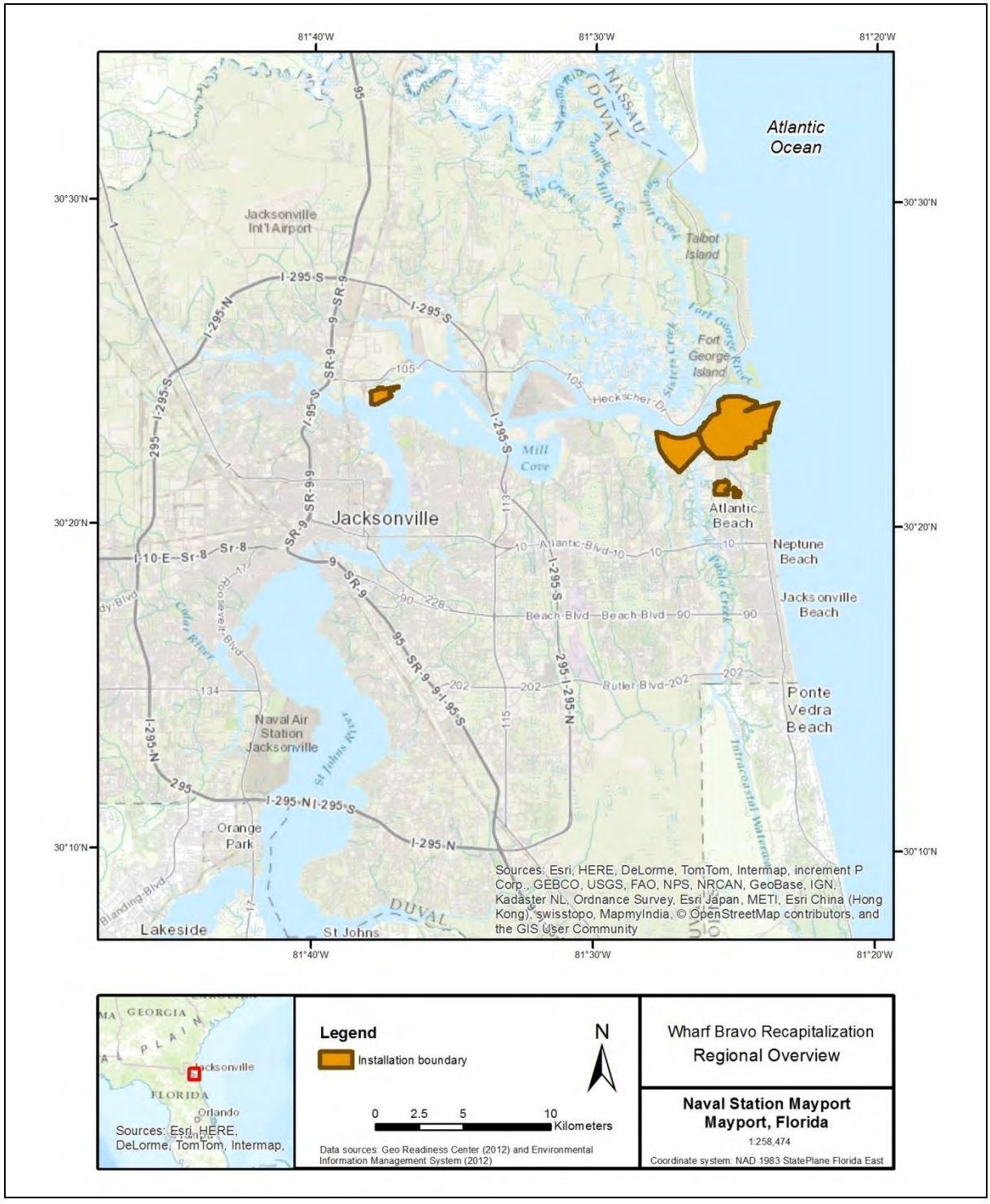
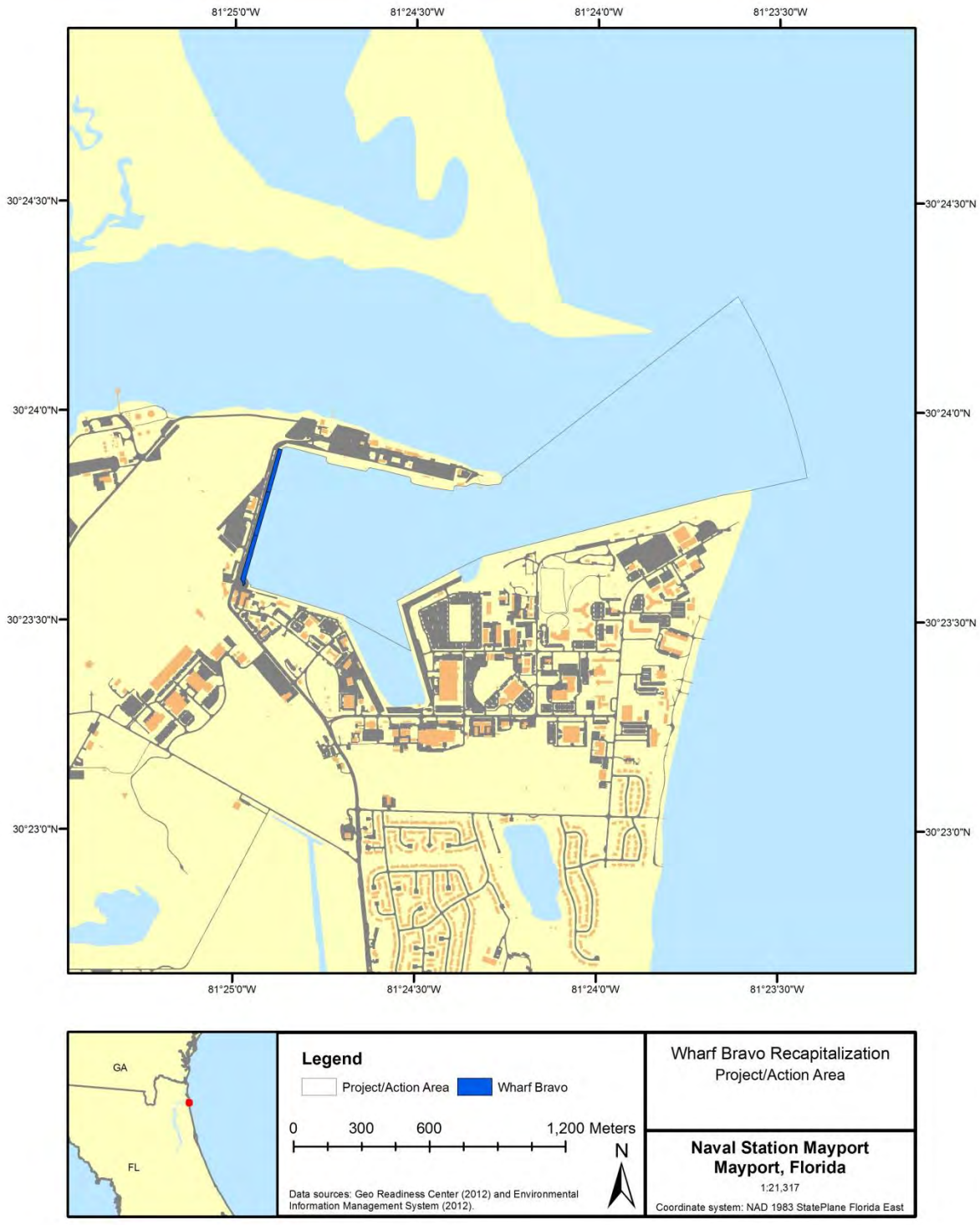


FIGURE 2-2. BRAVO WHARF RECAPITALIZATION PROJECT AREA



The Mayport turning basin is regularly dredged to a depth of 50 ft to allow for berthing of large military vessels. Salinity and temperature data for the project area are summarized in Table 2-1 and Figure 2-3, respectively.

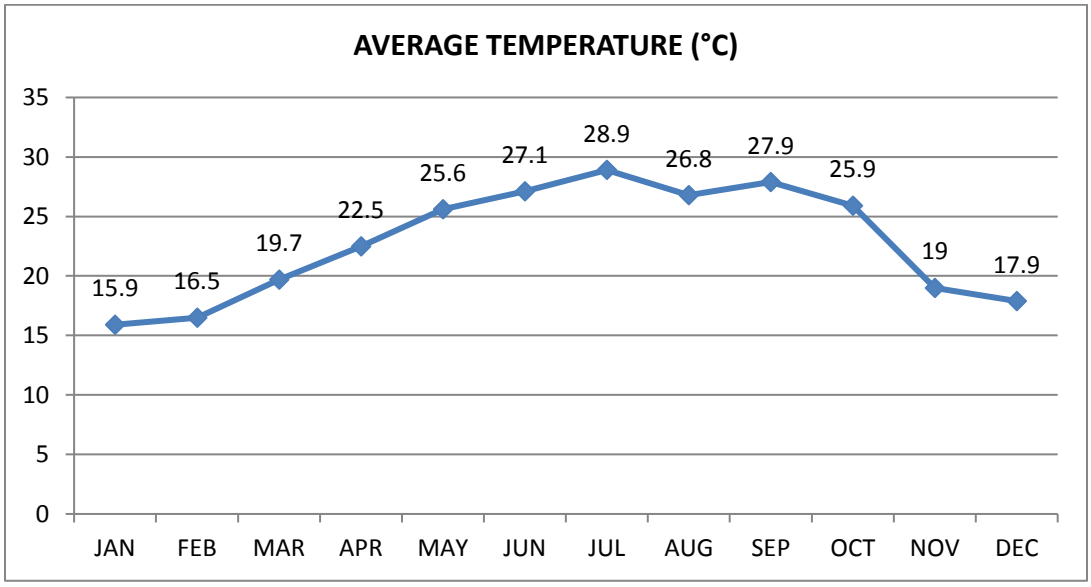
TABLE 2-1. MINIMUM AND MAXIMUM SURFACE AND BOTTOM SALINITIES

LOCATION	TIDE	WATER COLUMN	SALINITY
NAVSTA Mayport Turning Basin	Ebb	surface	30.6
		bottom	33.8
	Flood	surface	30.2
		bottom	33.6
NAVSTA Mayport Entrance Channel	Ebb	surface	30.0
		bottom	32.4
	Flood	surface	33.4
		bottom	34.7

Source: U.S. Department of the Navy 2008a

While water temperatures for the project area are not regularly recorded, average monthly temperatures at the closest NOAA station (Bar Pilot's Dock) ranged from 15.9 degrees Celsius (°C) (60.6 degrees Fahrenheit [°F]) in January to 28.9 °C (84°F) in August (Figure 2-3).

FIGURE 2-3. 2012 MONTHLY WATER TEMPERATURES AT BAR PILOT'S DOCK, FLORIDA



Source: National Oceanic and Atmospheric Administration 2012

3. Marine Mammal Species and Numbers

The species and numbers of marine mammals likely to be found within the activity area

The Navy has reviewed information about marine mammal species occurring in the western Atlantic along the east coast of Florida, and has determined that those listed in Table 3-1 may occur in the vicinity of the Project. The West Indian manatee (*Trichechus manatus*) is not regulated by NMFS and therefore is not considered further in this application. The responsible regulator for manatees is the U.S. Fish and Wildlife Service (USFWS). USFWS has promulgated guidance for protecting manatee occurring in the vicinity of near shore construction. The Navy and its contractors shall comply with the conditions intended to protect manatees from in-water work as outlined in Appendix A.

North Atlantic right whale, humpback whale, and Atlantic spotted dolphin densities were calculated from the Navy's Marine Species Density Database and Technical Report (U.S. Department of the Navy 2015). Bottlenose dolphin density was calculated based on surveys of the Mayport turning basin during late 2012 and early 2013 (U.S. Department of the Navy 2014).

TABLE 3-1. SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

SPECIES and ESTIMATED DENSITY	STOCK	OCCURRENCE and ABUNDANCE BEST (CV) / MIN	STATUS	
			MMPA	ESA
North Atlantic right whale 0.045028/ km^2	Western Atlantic	Rare / Seasonal – November to April 440 (0) / 440[1]	depleted	endangered
humpback whale 0.000556/ km^2	Gulf of Maine	Extralimital[2] 823 (0) / 823[1]	n/a	n/a
Atlantic spotted dolphin 0.005402 / km^2	Western North Atlantic	Rare / Seasonal – November to May 44,715 (0.43) / 31,610[1]	n/a	n/a
bottlenose dolphin 4.15366 / km^2	Western North Atlantic Offshore	Rare 77,532 (0.40) / 56,053[1]	n/a	n/a
	Western North Atlantic Northern Florida Coastal	Likely – year round 1,219 (0.67) / 730[1]	strategic	
	Jacksonville Estuarine System	Likely - year round, numbers may be slightly lower in winter 412 (0.06) / unknown[3]	strategic	
	Western North Atlantic Southern Migratory Coastal	Seasonal - January to March 9,173 (0.46) / 6,326[1]	strategic	

Sources: U. S. Department of the Navy 2015; U.S. Department of the Navy (2014) Turning Basin Bottlenose Dolphin Surveys; [1]Hayes et al. 2016 [2]Extralimital: there may be a small number of sighting or stranding records, but the activity area is outside the species' range of normal occurrence; Rare: there may be a few confirmed sightings, or the distribution of the species is near enough to the area of concern that the species could occur there; the species may occur but only infrequently or in small numbers; Likely: confirmed and regular sightings of the species occur year-round; [3]National Marine Fisheries Service 2009; this is an overestimate of the stock abundance in the area covered by the study because it includes non-resident and seasonally resident dolphins; most recent SAR has insufficient data on this stock

4. Affected Species Status and Distribution

A description of the status, distribution, and seasonal distribution (when applicable) of the affected species or stocks of marine mammals likely to be affected by such activities.

4.1. North Atlantic Right Whale

The North Atlantic Right Whale was listed as endangered in 1970 (35 FR 18319) under the Endangered Species Conservation Act of 1969; its listing was revised in 2008 (73 FR 12024). A five year review was completed in August 2012 with a recommendation to maintain the species' classification as endangered (National Marine Fisheries Service 2012). North Atlantic right whales are designated as depleted under the MMPA.

The western North Atlantic minimum stock size is based on a census of individual whales identified using photo-identification techniques. A review of the photo-ID recapture database as it existed on 17 November 2015 indicated that 440 individually recognized whales in the catalog were known to be alive during 2012. This number represents a minimum population size. This count has no associated coefficient of variation (Waring et al. 2016).

North Atlantic right whales are most often seen as individuals or pairs (New England Aquarium 2013). They migrate annually between the north and south Atlantic coasts of the United States. They can generally be found in calving grounds off Georgia and Florida from mid-November to mid-April; and then move to feeding grounds in the Gulf of Maine and Cape Cod in the summer (though sightings may occur year-round in this area) (National Marine Fisheries Service n.d.). North Atlantic right whale calves are born during December through March after 12 to 13 months of gestation (Kraus et al. 2001)

Dives of 5 to 15 min or longer have been reported (Cetacean and Turtle Assessment Program 1982; Baumgartner and Mate 2003), but can be much shorter when feeding (Winn et al. 1995) Longer surface intervals have been observed for reproductively-active females and their calves (Baumgartner and Mate 2003). In the Cape Cod Bay foraging area, this species has been observed feeding in the top 5 meters of the water column for long periods of time (Parks et al. 2011).

Based on annual surveys conducted from December through March between 1996 -2009, North Atlantic right whales are relatively common visitors to waters offshore from NAVSTA Mayport and the adjacent federal navigation channel (New England Aquarium 2013a; Loop pers. comm. 2012). Incidental sightings of North Atlantic right whales are a regular, although infrequent, occurrence in the St. Johns River and NAVSTA Mayport turning basin, with the most recent sighting of two individuals occurring at the mouth of the St. Johns River in December 2012 (Gibbons 2011, Loop pers. comm. 2012). Based on data in the Navy's Marine Species Density Database (MSDD), a density of 0.045028 individuals / square kilometer (km^2) has been estimated for the activity area.

4.2. Humpback Whale

Although humpback whales were listed as endangered in 1970 (35 FR 18319) under the Endangered Species Conservation Act of 1969, a status review was initiated in 2009 (74 FR 40568), and the Gulf of Maine stock was classified as not warranting listing in a final rule published 8 September 2016 (81 FR62259). This stock is not currently listed as endangered or threatened under the ESA. Humpback whale abundance is increasing through much of the species' range. Individuals that may occur in the vicinity of Bravo Wharf are from the Gulf of Maine stock. Humpback whales are designated as a strategic stock under the MMPA.

The most recent line-transect survey, which did not include the Scotian Shelf portion of the stock, produced an estimate of abundance for Gulf of Maine humpback whales of 331 animals (CV=0.48) with a resultant minimum population estimate for this stock of 228 animals. The line-transect based minimum estimate is unrealistic because at least 500 uniquely identifiable individual whales from the Gulf of Mexico stock were seen during the calendar year of that survey and the actual population would have been larger because re-sighting rates have historically been <1. Using the minimum count from at least 2 years prior to the year of a stock assessment report has allowed NMFS time to resight whales known to be alive prior to and after the focal year. Thus the minimum population estimate is set to the 2008 mark-recapture based count of 823.Current data suggest the Gulf of Maine stock is steadily increasing in numbers (Waring et al. 2016).

Humpback whales feed on a variety of invertebrates and small schooling fishes. The most common invertebrate prey are krill; the most common fish prey are herring, mackerel, sand lance, sardines, anchovies, and capelin (Clapham and Mead 1999). Feeding occurs both at the surface and in deeper waters, wherever prey is abundant. The humpback whale is the only species of baleen whale that shows strong evidence of cooperation when feeding in large groups (D'Vincent et al. 1985).

During the winter, most of the North Atlantic population of humpback whales is believed to migrate south to calving grounds in the West Indies region (Whitehead and Moore 1982; Smith et al. 1999; Stevick et al. 2003b), over shallow banks and along continental coasts, where calving occurs. Calving peaks from January through March, with some animals arriving as early as December and a few not leaving until June. Individuals from the U.S. and Canada are typically sighted in the West Indies in mid-February (Stevick et al. 2003b). Since humpback whales migrate south to calving grounds during the fall and make return migrations to the northern feeding grounds in spring, they are not expected off the coast of Florida during summer. There has been an increasing occurrence of humpbacks, which appear to be primarily juveniles, during the winter along the U.S. Atlantic coast from Florida north to Virginia (Clapham et al. 1993; Swingle et al. 1993; Wiley et al. 1995; Laerm et al. 1997).

The coastal region of Florida is not designated as an area of concentrated occurrence for humpback whales (U.S. Department of the Navy 2008). Examination of whaling catches revealed both northward and southward migrations are characterized by a staggering of sexual and maturational classes; lactating females are among the first to leave summer feeding grounds in the fall, followed by subadult males, mature males, non-pregnant females, and pregnant

females (Clapham 1996). On the northward migration, this order is broadly reversed, with newly pregnant females among the first to begin the return migration to high latitudes. Based on sightings, strandings, and life history, humpbacks would be expected to occur in waters off NAVSTA Mayport during fall, winter, and spring. The likelihood of occurrence is low, however, and even lower for the turning basin and Bravo Wharf activity area.

Based on data in the Navy's MSDD, a year-round density of 0.000556 individuals / km^2 has been estimated for the activity area.

4.3. Atlantic Spotted Dolphin

Atlantic spotted dolphins occurring in the Bravo Wharf activity area belong to the Western North Atlantic Stock.

The Atlantic spotted dolphin is found in nearshore tropical to warm-temperate waters, predominantly over the continental shelf and upper slope. In the western Atlantic, this species is distributed from New England to Brazil and is found in the Gulf of Mexico as well as the Caribbean Sea (Perrin 2002).

Atlantic spotted dolphins in the Gulf of Mexico were observed feeding cooperatively on clupeid fishes and are known to feed in association with shrimp trawlers (Fertl and Leatherwood 1997; Fertl and Wursig 1995). In the Bahamas, this species was observed to chase and catch flying fish (MacLeod et al. 2004). The diet of the Atlantic spotted dolphin varies depending on location, and can include burrowing and schooling fish, and squid (Jefferson et al. 2008; Herzing and Elliser 2013).

While specific seasonal occurrence information for Atlantic spotted dolphins on Florida's Atlantic coast does not exist, studies have indicated that higher numbers of individuals reported over the west Florida continental shelf from November to May than during the rest of the year, suggesting that this species may migrate seasonally (Griffin and Griffin 2003). Atlantic spotted dolphins are typically observed in deeper offshore waters. They could potentially occur in shallower coastal waters in and around the activity area, but the likelihood is low.

Based on data in the Navy's MSDD, a year-round density of 0.005402 individuals / km^2 has been estimated for the activity area.

4.4. Bottlenose Dolphin

Bottlenose dolphins occurring in the Bravo Wharf activity area may be individuals belonging to any of the following stocks: the Western North Atlantic Offshore Stock, the Western North Atlantic Northern Florida Coastal Stock, the Jacksonville Estuarine System Stock; and the Western North Atlantic Southern Migratory Coastal Stock.

Along the Atlantic coast of the U.S., where the majority of detailed work on bottlenose dolphins has been conducted, male and female bottlenose dolphins reach physical maturity at 13 years,

with females reaching sexual maturity as early as seven years (Mead and Potter 1990). Bottlenose dolphins are flexible in their timing of reproduction. Seasons of birth for bottlenose dolphin populations are likely responses to seasonal patterns of availability of local resources (Urian et al. 1996). Thayer et al. (2003) found bottlenose dolphins in North Carolina to exhibit a strong calving peak in spring, particularly May and June, and a diffuse peak from late spring to early fall. There is a gestation period of one year (Caldwell and Caldwell 1972). Calves are weaned as early as one and a half years of age (Reynolds et al. 2000), and typically remain with their mothers for a period of three to eight years (Wells et al. 1987), although longer periods are documented (Reynolds et al. 2000). There are no specific breeding locations for this species.

Dive durations as long as 15 min are recorded for trained individuals (Ridgway et al. 1969). Typical dives, however, are shallower and have a much shorter duration. Mean dive durations of Atlantic bottlenose dolphins typically range from 20 to 40 seconds at shallow depths (Mate et al. 1995)

Bottlenose dolphins typically occur in groups of 2 – 15 individuals, but significantly larger groups have also been reported (Shane et al. 1986; Kerr et al. 2005). Coastal bottlenose dolphins typically exhibit smaller group sizes than larger forms, as water depth appears to be a significant influence on group size (Shane et al. 1986). Shallow, confined water areas typically support smaller group sizes, some degree of regional site fidelity, and limited movement patterns (Shane et al. 1986; Wells et al. 1987).

Recent surveys have shown that bottlenose dolphins in the vicinity of Bravo Wharf occur in groups of 5 or more, pairs, and individually. Larger groups, observed infrequently, are generally seen at the entrance of the turning basin. These groups navigate into the basin, but generally not very far. A mother / calf pair was observed regularly during the winter and early spring of 2012 / 2013. Bottlenose dolphins are rarely observed lingering in a particular area in the turning basin; rather, they appear to move purposefully through the basin and then leave (Peters pers. comm. 2013).

Based on surveys being conducted in the NAVSTA Mayport turning basin during late 2012 and early 2013 (U.S. Department of the Navy 2014), a density of 4.15366 individuals / km^2 has been estimated for the project area (see Appendix C for the full report and survey details).

5. Incidental Take Authorization Requested

The type of incidental taking authorization that is being requested (i.e., takes by harassment only, takes by harassment, injury, and/or death), and the method of incidental taking.

Under the 1994 Amendments to the MMPA, harassment is statutorily defined as any act of pursuit, torment, or annoyance which:

- **Level A Harassment** has the potential to injure a marine mammal or marine mammal stock in the wild; or,
- **Level B Harassment** has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild (National Marine Fisheries Service 2013).

The marine mammal density data used for this analysis was retrieved from the Navy's Marine Species Density Database, and the current turning basin survey effort at NAVSTA Mayport. Table 5-1 summarizes the species densities. The estimated number of exposures that could result for the one year period of construction for the Project from 13 March 2018 to 12 March 2019 is summarized in Table 5-2. Estimation of bottlenose dolphin density was based on surveys of the basin, detailed in U.S Department of the Navy (2014).

TABLE 5-1. SPECIES DENSITIES

Species	Highest Density[1] (season)
North Atlantic right whale	0.045028 / km^2 (all)
humpback whale	0.000556 / km^2 (all)
Atlantic spotted dolphin	0.005402 / km^2 (spring)
bottlenose dolphin[2]	4.15366 / km^2 (all)

[1]Refer to Roberts JJ, Mannocci L, Halpin PN (2015) Marine mammal density models for the U.S. Navy Atlantic Fleet Training and Testing (AFTT) study area for the Phase III Navy Marine Species Density Database (NMSDD). Document version 1.1. Report prepared for Naval Facilities Engineering Command, Atlantic by the Duke University Marine Geospatial Ecology Lab, Durham, North Carolina.; [2]U.S. Department of the Navy (2014) Survey Report.

Assumptions to be considered for the bottlenose dolphin incidental take estimate:

1) Individual animals may have been counted more than once.
2) The number of animals per square kilometer is assumed to be static, therefore indicating a resident population with no "refreshment" of new animals entering or leaving the area. This is not a reasonable real world assumption, but in the absence of specific data on bottlenose dolphin movements in and out of the project area it has been applied for modeling purposes and represents a conservative approach.
3) Animals with a Level B exposure can be re-exposed every 24 hours, according to the standard of analysis for incidental takes. Therefore, while 191 incidental takes of bottlenose dolphins are being requested, the same animal could be affected on multiple days instead of 191 different dolphins being exposed once each. For example, 19 animals could each be exposed to noise levels that reach Level B criteria ten times over the course of the 40 day in-water work period.

The density of each species was multiplied by the size of the relevant zone of influence to determine the estimated number of exposures per day. This number was multiplied by the estimated number of pile-driving days (vibratory: 30 days; impact: 10 days) and rounded to the nearest whole number to calculate takes for the entire Project. The Navy is requesting authorization for a total of 191 Level B (behavioral) incidental takes of bottlenose dolphins over the course of the Project (Table 5–2). Exposures may be to any age / reproductive class of the species.

The Navy has committed to avoiding any incidental takes (Level A or Level B) of North Atlantic right whales during this project. While the model predicts two Level B right whale exposures, the projected Zone of Influence extends only slightly beyond the mouth of the St. Johns River. Only a single case of a right whale entering the St Johns River has been documented to date (Gibbons, 2011; Cravey 2016), and this case caused a disruption to all traffic at the mouth of the river and in the NS Mayport turning basin. In the highly unlikely event that a right whale enters the mouth of the river during pile driving activities, pile driving would shut down and not resume until the whale is confirmed to be outside the zone of influence. Therefore, no Level B takes of North Atlantic right whales are anticipated.

No incidental takes are requested for any other marine mammal species.

The Navy has committed to avoiding Level A takes during this project and shall monitor the entire injury zone for both types of driving; in-water work shall be shut down should a protected species approach or enter these zones. Therefore, no Level A exposures are anticipated or requested.

Methods for developing the incidental take estimate are detailed in Chapter 6 and Appendix B.

TABLE 5-2. ESTIMATED MARINE MAMMAL EXPOSURES

SPECIES	DENSITY (per km^2)	CALCULATED EXPOSURES		TOTALS
		Level A	Level B	
VIBRATORY DRIVING – Phase II (berths B-2 and B-3) – 40 % remaining				
North Atlantic right whale	0.045028 / km^2 (all)	0	2	2
humpback whale	0.000556 / km^2 (all)	0	0	0
Atlantic spotted dolphin	0.005402 / km^2 (spring)	0	0	0
bottlenose dolphin	4.15366 / km^2 (all)	0	169	169
CONTINGENCY IMPACT DRIVING – Phase II (berths B-2 and B-3) – 40 % remaining				
North Atlantic right whale	0.045028/ km^2 (all)	0	0	0
humpback whale	0.000556 / km^2 (all)	0	0	0
Atlantic spotted dolphin	0.005402 / km^2 (spring)	0	0	0
bottlenose dolphin	4.15366 / km^2 (all)	0	22	22
CALCULATED EXPOSURE TOTALS		**0**	**193**	**193**

6. Numbers and Species Taken

By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in Section 5, and the number of times such takings by each type of taking are likely to occur.

The methods for estimating the number and types of exposure are described in the sections below, followed by the method for quantifying exposures of marine mammals to sources of energy exceeding those threshold values. Exposure of each was determined by:

- The potential of each species to be impacted by the acoustic sources as determined by the acoustic criterion (81 FR 51693) for marine mammals.
- The potential presence of each species and their estimated density in the zone of influence for the Project.
- The area of impact for each pile driving sound source (estimated by taking into account the source levels, propagation loss and thresholds at which each acoustic criterion are met).

Potential exposures were calculated by multiplying the density of each marine mammal species potentially present by the total impacted area for each threshold value by the potential number of days of pile driving.

An introduction to the fundamentals of acoustics and use of the decibel unit can be found in Appendix B.

Assessing whether a sound may disturb or injure a marine mammal involves understanding the characteristics of the acoustic source and the potential effects that sound may have on the animal's physiology and behavior. Although it is known that sound is important for marine mammal communication, navigation, and foraging (National Research Council 2003, 2005), there are many unknowns in assessing impacts such as the potential interaction of different effects and the biological significance of responses by marine mammals to sound exposures (Nowacek et al. 2007; Southall et al. 2007). Furthermore, many factors other than the received level of sound may affect an animal's reaction, such as the animal's physical condition, prior experience with the sound, and proximity to the source of the sound (Nowacek et al. 2007).

Acoustically-mediated behaviors, including social interactions, foraging, and navigation, may be particularly vulnerable to disturbance during pile-driving activities, and it is important to understand the source characteristics of marine mammal vocalizations in order to address potential masking (see Appendix B) and disturbance. The following sections address hearing and sound production of all marine mammals that may be present in the project area during pile driving.

6.1. Hearing and Vocalization for North Atlantic Right Whales

Hearing in North Atlantic right whales and other large baleen whales is poorly understood due to the difficulty of performing experimental tests on live whales. Mathematical models and anatomical studies of whale ears have been used to estimate hearing in baleen whales. Recent morphometric analyses of North Atlantic right whale inner ears estimates a hearing range of approximately 0.01 to 22 kHz based on established marine mammal models (Parks et al. 2004; Parks and Tyack 2005; Parks et al. 2007).

North Atlantic right whales produce a variety of sounds, including moans, screams, gunshots, blows, upcalls, downcalls, and warbles that are often linked to specific behaviors (Matthews et al. 2001; Laurinolli et al. 2003; Vanderlaan et al. 2003; Parks et al. 2005; Parks and Tyack 2005). Sounds can be divided into three main categories: (1) blow sounds; (2) broadband impulsive sounds; and (3) tonal call types (Parks and Clark 2007). Blow sounds are those coinciding with an exhalation; it is not known whether these are intentional communication signals or just produced incidentally (Parks and Clark 2007). Broadband sounds include non-vocal slaps (when the whale strikes the surface of the water with parts of its body) and the "gunshot" sound; data suggests that the latter serves a communicative purpose (Parks and Clark 2007; Parks et al. 2012). Tonal calls can be divided into simple, low-frequency, stereo-typed calls and more complex, frequency-modulated, higher frequency calls (Parks and Clark 2007). Most of these sounds range in frequency from 0.02 to 15 kHz (dominant frequency range from 0.02 to less than 2 kHz; durations typically range from 0.01 to multiple seconds) with some sounds having multiple harmonics (Parks and Tyack 2005). Source levels for some of these sounds have been measured as ranging from 137 to 192 dB root-mean-square (rms) re: 1 μPa-m (decibels at the reference level of one micro Pascal at one meter) (Parks et al. 2005; Parks and Tyack 2005). In certain regions (i.e., northeast Atlantic), preliminary results indicate that right whales vocalize more from dusk to dawn than during the daytime (Leaper and Gillespie 2006; Mussoline et al. 2012; Parks et al. 2012). Vocalization rates of North Atlantic right whales are also highly variable, and individuals have been known to remain silent for hours (Gillespie and Leaper 2001). Baumgartner et al. (2005) noted that downsweep calls by North Atlantic right whales in the 16 to 160 Hz frequency band exhibited a diel pattern (fewer calls at night) that corresponded strongly to the diel vertical migration of zooplankton.

6.2. Hearing and Vocalization for Humpback Whales

While no measured data on hearing ability are available for humpback whales, Ketten (1997) hypothesized that mysticetes have acute infrasonic hearing. Houser et al. (2001) produced the first humpback whale audiogram (using a mathematical model), which was u-shaped and conformed to the typical mammalian presentation. The area of best hearing, or sensitivity, according to the model was observed between frequencies from 700 Hz to 10 kHz but the maximum range of hearing was identified between 200 Hz to 14 kHz. Au et al. (2006) noted that if the popular notion that animals generally hear the totality of the sounds they produce is applied to humpback whales, this suggests that its upper frequency limit of hearing is as high as 24 kHz.

Humpback whales are known to produce three classes of vocalizations: (1) "songs" in the late fall, winter, and spring by solitary males; (2) sounds made within groups on the wintering

(calving) grounds; and (3) social sounds made on the feeding grounds (Thomson and Richardson 1995). The best-known types of sounds produced by humpback whales are songs, which are thought to be breeding displays used only by adult males (Helweg et al. 1992). Singing is most common on breeding grounds during the winter and spring months but is occasionally heard outside breeding areas and out of season (Mattila et al. 1987; Gabriele et al. 2001; Gabriele and Frankel 2002; Clark and Clapham 2004). Humpback song is an elaborate series of patterned vocalizations which are hierarchical in nature (Payne and McVay 1971). There is geographical variation in humpback whale song, with different populations singing different songs and all members of a population using the same basic song. However, the song evolves over the course of a breeding season but remains nearly unchanged from the end of one season to the start of the next (Payne et al. 1983). Components of the song range from under 20 Hz to 4 kHz and occasionally 8 kHz, with source levels measured between 151 and 189 dB re 1 µPa-m and high-frequency harmonics extending beyond 24 kHz (Au et al. 2001; Au et al. 2006).

Social calls range in frequency from 50 Hz to over 10 kHz, with dominant frequencies below 3 kHz (Silber 1986). Female vocalizations appear to be simple; Simão and Moreira (2005) noted little complexity. "Feeding" calls, unlike song and social sounds, are highly stereotyped series of narrow-band trumpeting calls. They are 20 Hz to 2 kHz, less than 1 sec in duration, and have source levels of 162 to 192 dB re 1 µPa-m. The fundamental frequency of feeding calls is approximately 500 Hz (D'Vincent et al. 1985; Thompson et al. 1986).

6.3. Hearing and Vocalization for Atlantic Spotted Dolphins

A variety of sounds including whistles, echolocation clicks, squawks, barks, growls, and chirps have been recorded for the Atlantic spotted dolphin (Thomson and Richardson 1995). Whistles have dominant frequencies below 20 kHz (range: 7.1 to 14.5 kHz) but multiple harmonics extend above 100 kHz, while burst pulses consist of frequencies above 20 kHz (dominant frequency of approximately 40 kHz) (Lammers et al. 2003). Other sounds, such as squawks, barks, growls, and chirps, typically range in frequency from 100 Hz to 8 kHz (Thomson and Richardson 1995). Recently recorded echolocation clicks have two dominant frequency ranges at 40 to 50 kHz and 110 to 130 kHz, depending on source level (i.e., lower source levels typically correspond to lower frequencies and higher frequencies to higher source levels (Au and Herzing 2003).

Echolocation click source levels as high as 210 dB re 1 µPa-m peak-to-peak have been recorded (Au and Herzing 2003). Spotted dolphins in The Bahamas were frequently recorded during agonistic / aggressive interactions with bottlenose dolphins (and their own species) to produce squawks (200 Hz to 12 kHz broad band burst pulses; males and females), screams (5.8 to 9.4 kHz whistles; males only), barks (200 Hz to 20 kHz burst pulses; males only), and synchronized squawks (100 Hz - 15 kHz burst pulses; males only in a coordinated group) (Herzing 1996).

There have been no data collected on Atlantic spotted dolphin hearing abilities. However, odontocetes are generally adapted to hear high-frequencies (Ketten 1997) and it can be assumed that vocalization frequencies are generally within the hearing range of a species.

6.4. Hearing and Vocalization for Bottlenose Dolphins

Bottlenose dolphins can typically hear within a broad frequency range of 200 Hz to 160 kHz (Au 1993; Turl 1993), though with exposure during testing some dolphins might receive information as low as 50 Hz (Turl 1993). Electrophysiological experiments suggest the bottlenose dolphin brain has a dual analysis system: one specialized for ultrasonic clicks and another for lower-frequency sounds, such as whistles (Ridgway 2000). Scientists have reported a range of highest sensitivity between 25 and 70 kHz, with peaks in sensitivity at 25 and 50 kHz (Nachtigall et al. 2000). Recent research on the same individuals indicates auditory thresholds obtained by electrophysiological methods correlate well with those obtained in behavior studies, except at the some lower (10 kHz) and higher (80 and 100 kHz) frequencies (Finneran and Houser 2006).

Sounds emitted by bottlenose dolphins have been classified into two broad categories: pulsed sounds (including clicks and burst-pulses) and narrow-band continuous wave sounds (whistles), which usually are frequency modulated. Clicks and whistles have dominant frequency ranges of 110 to 130 kHz and source levels of 218 to 228 dB re 1 µPa-m (Au 1993) and 3.4 to 14.5 kHz and 125 to 173 dB re 1 µPa-m, respectively (Ketten 1998). Whistles are primarily associated with communication and can serve to identify specific individuals (i.e., signature whistles) (Caldwell and Caldwell 1965; Janik et al. 2006). Up to 52% of whistles produced by bottlenose dolphin groups with mother-calf pairs have been classified as signature whistles (Cook et al. 2004).

Sound production is also influenced by group type (single or multiple individuals), habitat, and behavior (Nowacek 2005). Bray calls (low-frequency vocalizations; majority of energy below 4 kHz), for example, are used when capturing fishes, specifically sea trout (*Salmo trutta*) and Atlantic salmon (*Salmo salar*), in some regions (i.e., Moray Firth, Scotland) (Janik 2000). Additionally, whistle production has been observed to increase while feeding (Acevedo-Gutiérrez and Stienessen 2004; Cook et al. 2004). Both whistles and clicks have been demonstrated to vary geographically in terms of overall vocal activity, group size, and specific context (e.g., feeding, milling, traveling, and socializing) (Jones and Sayigh 2002; Zaretsky et al. 2005; Baron 2006). For example, preliminary research indicates characteristics of whistles from populations in the northern Gulf of Mexico significantly differ (i.e., in frequency and duration) from those in the western north Atlantic (Zaretsky et al. 2005; Baron 2006).

6.5. Sound Exposure Criteria and Thresholds

Under the MMPA, NMFS has defined levels of harassment for marine mammals. Level A harassment is defined as "any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild." Level B harassment is defined as "Any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding or sheltering."

Since 1997, NMFS has used generic sound exposure thresholds to determine when an activity in the ocean that produces sound might result in behavioral impacts to a marine mammal such that a take by harassment might occur (70 FR 1871). Behavioral harassment (Level B) is considered to

have occurred (and thus a "take" is counted) when marine mammals are exposed to underwater sounds below the injury threshold, but ≥ 160 dB re 1 µPa rms for impulsive sounds (e.g., impact pile driving) and 120 dB re 1 µPa rms for non-impulsive noise (e.g., vibratory pile driving).

In August 2016, NMFS issued updated acoustic guidance setting criteria and thresholds for the potential for injurious impacts of sound (Level A harassment) on marine mammal hearing (81 FR 51693). This guidance sets thresholds for permanent and temporary threshold shifts (PTS and TTS, respectively). PTS is considered an injurious impact because the animal's hearing thresholds do not recover to pre-exposure levels.

6.6. Limitations of Existing Noise Criteria

To date, there is no research or data supporting a response by odontocetes to non-impulsive sounds from vibratory pile driving as low as the 120 dB re 1 µPa rms threshold. The application of the 120 dB rms re 1µPa threshold can be problematic because this threshold level can be at or below the ambient noise level of certain locations. For example, noise levels at some industrialized ports in Puget Sound, WA, have been measured at between 120 and 130 dB re 1µPa (Washington State Department of Transportation 2012). As a result, such analyses may be overly conservative, and the threshold level is subject to ongoing discussion due to these issues (74 FR 41684). The 120 dB re 1 µPa rms threshold level for non-impulsive noise originated from research conducted by Malme et al. (1984, 1988) for California gray whale response to non-impulsive industrial sounds such as drilling operations. Note: The 120 dB re 1 µPa rms *non-impulsive* sound threshold should not be confused with the 120 dB re 1 µPa rms *impulsive* sound criterion established for migrating bowhead whales in the Arctic as a result of research in the Beaufort Sea (Richardson et al. 1995; Miller et al. 1999).

6.7. Ambient Noise

The baseline noise level in the turning basin is referred to as the "ambient noise level". Ambient noise is comprised of sounds produced by a number of natural and anthropogenic sources. Natural noise sources can include wind, waves, precipitation, and biological sources such as shrimp, fish, and cetaceans. These sources produce sound in a wide variety of frequency ranges (Urick 1983; Richardson et al. 1995) and can vary over long (days to years) and short (seconds to hours) time scales. In shallow waters, precipitation may contribute up to 35 dB to the existing sound level, and increases in wind speed of 5 to 10 knots can cause a 5 dB increase in ambient ocean noise between 20 Hz and 100 kHz (Urick 1983). High noise levels may also occur in near shore areas during heavy surf, which may increase low frequency (200 Hz – 2 kHz) underwater noise levels by 20 dB or more within 200 yards of the surf zone (Wilson et al. 1985). At Mayport, vessel wakes in the St. Johns River may cause breaking waves on shore, contributing to the ambient acoustic environment.

Anthropogenic noise sources also contribute to ambient noise levels, particularly in ports and other high use areas in coastal regions. Normal port activities include vessel traffic (from large ships, support vessels, and security boats), loading and maintenance operations, and other activities (sonar and echo-sounders from commercial and recreational vessels, construction, etc.)

which all generate underwater sound (Urick 1983). Additionally, noise produced by mechanized equipment on wharves or adjacent shorelines may propagate underwater and contribute to underwater ambient noise levels.

The underwater acoustic environment in the Mayport turning basin is dominated by noise from day-to-day port and vessel activities. The basin is sheltered from most wave noise, but is a high-use area for naval ships, tugboats, and security vessels. When underway, these sources can create noise between 20 Hz and 16 kHz (Lesage et al. 1999), with broadband noise levels up to 180 dB re 1 µPa rms (Table 6-1) Normal port operations, including transits, docking, and maintenance by multiple tugboats and ships would continue. Measurements of background noise in the Mayport turning basin were conducted during monitoring of pile driving at Wharf C-2 in June of 2015. 10-second average rms values ranged from 120 – 132 dB rms, with an overall average of 128 dB rms. While this sound level is not necessarily representative of noise levels year-round, it does provide a snapshot view of the acoustic environment within the basin during the season when dolphins are most likely to be present.

The existing sources of anthropogenic noise in the Mayport turning basin are generally non-impulsive (see Appendix B), intermittent sources such as vessel engines; this category also includes noise from vibratory pile driving. Impact pile driving noise differs from these sources in that it is impulsive, with a fast rise time and multiple short-duration (50 – 100 millisecond; Illingworth & Rodkin 2001) events. The use of impact driving during the proposed project is limited to instances when vibratory driving fails, and will be limited to a maximum of 20 strikes per day. Because of the very limited use of impact pile driving during the proposed action, the Navy expects no long-term change in the average ambient noise environment with respect to impulsive sounds as a result of impact pile driving.

TABLE 6-1. REPRESENTATIVE LEVELS OF NOISE FROM ANTHROPOGENIC SOURCES

Noise Source	Frequency Range (Hz)	Underwater Noise Level (dB re 1 µPa)
Small vessels[1]	250–6,000	151 dB rms at 1 m
Large vessels[2]	20 – 1,500	170 – 180 dB rms at 1 m
Tug docking barge[3]	200–1,000	149 dB rms at 100 m
Vibratory driving of 24-inch steel pipe pile[4]	50 – 1,500	159 dB rms at 10 m
Impact driving of 24-inch steel pipe pile[5]	50 – 1,500	186 dB rms at 10 m

m = meter ; Sources: [1]Lesage et al. 1999; [2]Richardson et al. 1995; [3]Blackwell and Greene 2002; [4]Illingworth & Rodkin 2012; [5]Washington Department of Transportation 2005

Airborne ambient noise in industrial areas such as the Mayport turning basin is comprised of sounds from trucks, cranes, compressors, generators, pumps, ship engines, and other equipment. While there are no current measurements of airborne ambient noise in the basin or wharf areas, expected noise levels range from a daytime minimum of 55 dBA to a maximum of 99 dBA, assuming that multiple sources will be operating simultaneously (Washington State Department of Transportation 2007).

6.8. Underwater Noise from Pile Driving

Noise levels produced by pile driving are influenced by factors including pile type, driving method, and the physical environment in which the activity takes place. A number of studies have examined sound pressure levels recorded from underwater pile driving projects in California and Washington, creating a large body of data for impact driving of steel pipe piles, concrete piles, and some timber piles (California Department of Transportation 2012, U.S. Navy 2017).

Vibratory driving of steel sheet piles was monitored during the first year of construction at the nearby C-2 Wharf at Naval Station Mayport during 2015. Measurements were conducted from a small boat in the turning basin and from the construction barge itself. Details are available in U.S. Navy (2017). Source levels for a 10-second period of driving averaged 156 dB re 1µPa rms (U.S. Navy 2017). This level was used as a proxy for modeling installation of sheet piles at Bravo Wharf. No impact driving was measured at this location; therefore, proxy levels for impact driving have been calculated from other available source levels.

Measured sound pressure levels for 24 in. diameter steel sheet piles and 24 in. diameter steel pipe piles are available impact driving. To determine the most appropriate sound pressure levels for this project, data from studies which met the following parameters were considered:

- Pile size and type: steel pipe piles (24 in. diameter) and/or steel sheet piles (24 in. wide)
- Installation method: impact hammer
- Physical environment - water depth 15 ft. (4.5 m) or greater, sediment similar to sandy bottom in Mayport turning basin.

Table 6-2 details representative pile driving sound pressure levels measured from steel pipe piles and steel sheet piles. Comparison of measured sound pressure levels from the steel pipe piles and steel sheet piles revealed that levels from sheet pile driving were higher than those from pipe pile driving; the Navy has therefore used the more conservative sound pressure levels from steel sheet piles to model the proposed action. The selected sound pressure levels used for modeling steel piles in this application were 156 dB re 1 µPa rms for vibratory driving and 190 dB re 1µPa rms for impact driving.

TABLE 6-2. IMPACT INSTALLATION UNDERWATER SOUND PRESSURE LEVELS EXPECTED BASED ON SIMILAR IN-SITU MONITORED CONSTRUCTION ACTIVITIES

Project and Location	Pile Size and Type	Water Depth	Range to pile	RMS	Peak	SEL	Sediment
Friday Harbor Ferry Terminal, WA[a]	24 inch steel pipe	12.8 m	10 m	170	183	180	Sandy silt/clay
		13.4 m		186	205	179	
		14.3 m		186	204	179	
		10 m		194	210	185	Sandy silt/rock
		10 m		195	215	187	
		10 m		193	212	184	
Typical values, Caltrans compendium summary table[b]	24 inch steel pipe	15	NA	194	207	178	Unknown
		5	NA	190	203	177	Unknown
Berth 23 Port of Oakland[b]	24 inch steel sheet pile	12 – 14 m	10 m	189	205	179	Unknown

Sound levels expressed as dB re 1 µPa rms and dB re 1 µPa peak for RMS and Peak SPL measurements, respectively; Sources: [a]Washington State Department of Transportation 2005; [b]California Department of Transportation 2012

6.9. Underwater Sound Propagation

Pile driving can generate underwater noise that may result in disturbance to marine mammals within the project area. Modeling sound propagation is useful in evaluating noise levels to determine which marine mammals may be exposed at a given distance from the pile driving activity. The decrease in acoustic intensity as a sound wave propagates outward from a source is known as transmission loss (TL).

The formula for transmission loss is:

$$TL = B * log_{10}\left(\frac{R_1}{R_2}\right) + C * R_1, \text{ where}$$

B = logarithmic (predominantly spreading) loss

C = linear (scattering and absorption) loss

R_1 = range from source in meters

R_2 = range from driven pile to original measurement location (generally 10 m)

The amount of linear loss (C) is proportional to the frequency of a sound. Due to the low frequencies of sound generated by impact and vibratory pile driving, this factor was assumed to be zero for all calculations in this assessment and transmission loss was calculated using only logarithmic spreading. Therefore, using practical spreading (B=15), the revised formula for transmission loss is $TL = 15 \log_{10} (R_1/10)$.

6.10. Calculated Zones of Influence

The practical spreading loss model discussed above was used to calculate the propagation of pile driving sound in and around the Mayport turning basin. A total of 40 days of pile driving were modeled; 30 days of vibratory driving, plus 10 days of contingency impact driving. No sound mitigation methods (bubble curtains, cofferdams, etc.) are proposed and therefore no attenuation was included in the acoustic model.

For vibratory driving, the acoustic analysis used the assumption that an average of 12 sheet pile pairs would be driven each day. Previous measurements of pile driving at Wharf C-2 at NS Mayport indicated that the average time required to drive a sheet pile pair to completion via vibratory installation was approximately 20 seconds, and the maximum time required was just over 1 minute (US Navy 2017). For the purposes of this application, the Navy has conservatively assumed that vibratory installation of each sheet pile pair takes approximately 1 minute. For impact driving, modeling assumed a maximum of 20 strikes of the impact hammer per day, which is expected to take no more than five to ten minutes to complete.

Radii for the Level A zones of influence were calculated using the NOAA Acoustic Criteria Spreadsheet (Appendix D). Level B ZOIs were calculated using the practical spreading loss model out to the noise thresholds of 160 and 120 dB rms for impact and vibratory driving, respectively.

TABLE 6-3. CALCULATED DISTANCES TO / AREAS ENCOMPASSED BY THE UNDERWATER MARINE MAMMAL NOISE THRESHOLDS FOR PILE DRIVING

Pile Type	Driving Method	Threshold	Distance (m)[1]	Area (km^2)
Steel sheet piles	vibratory	LF[2] Level A (injury): 199 dB SEL_{cum} MF Level A (injury): 198 dB SEL_{cum}	1.1 0.1	0
		Level B (behavior): 120 dB re 1µPa rms	2,512	1.3550776

	impact (contingency only)	LF[2] Level A (injury): 183 dB SEL_{cum} MF Level A (injury): 185 dB SEL_{cum}	216 7.7	0.004
		Level B (behavior): 160 dB re 1µPa rms	1,000	0.5313217

dB = decibel; rms = root-mean-square; µPa = micro Pascal; LF = low-frequency cetacean functional hearing group; MF = mid-frequency cetacean functional hearing group

[1]Sound pressure levels used for calculations are 156 dB rms and 190 dB rms for vibratory and impact driving, respectively.

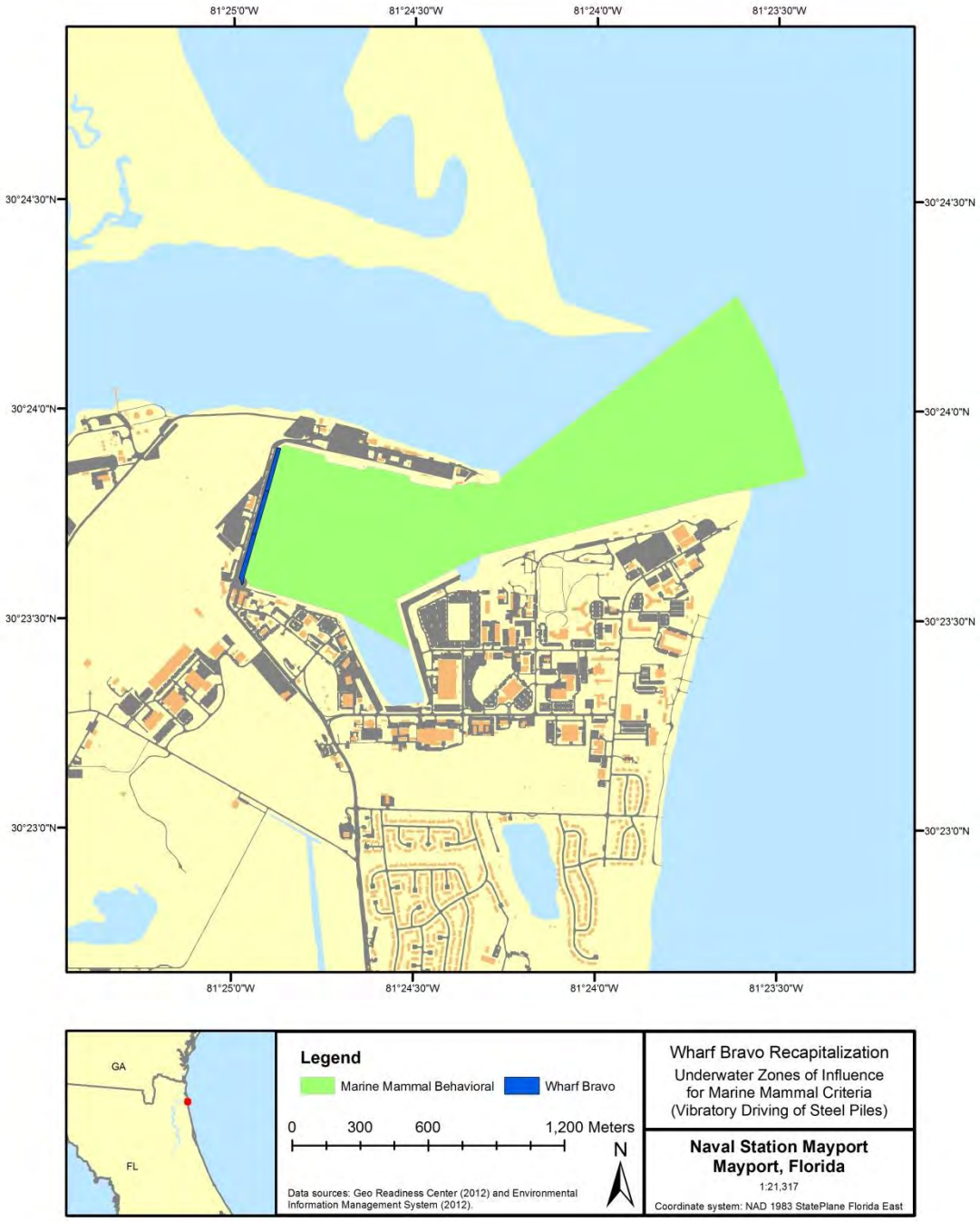
[2]LF injury ZOI distances are presented for reference, and do not extend outside of the turning basin. Areas for LF injury zones were not calculated due to the extremely low likelihood of a large whale entering the turning basin.

The calculations presented in Table 6-3assume a field free of obstruction, which is unrealistic because the Mayport turning basin does not represent open water conditions (free field) and sounds will attenuate as they encounter land or other solid obstacles. As a result, the distances calculated may not actually be attained at the project area. The actual distances to the behavioral disturbance thresholds for impact and vibratory pile driving are likely to be shorter than those calculated due to the irregular contour of the waterfront and the maximum fetch (farthest distance sound waves travel without obstruction [i.e. line of sight]) at the project area. Table 6-3 also depicts the actual areas encompassed by the marine mammal thresholds during the project.

Figures 6-1 and 6-2 depict the areas of each underwater sound threshold that are predicted to occur at the project area due to pile driving for mid-frequency cetaceans during each stage of the project. Note: injury zone for vibratory pile driving is not visible due to the size of the zone (> 1 m) and map scale. The injury zones for low-frequency cetaceans are not depicted due to the extremely low likelihood of a large whale entering the turning basin.

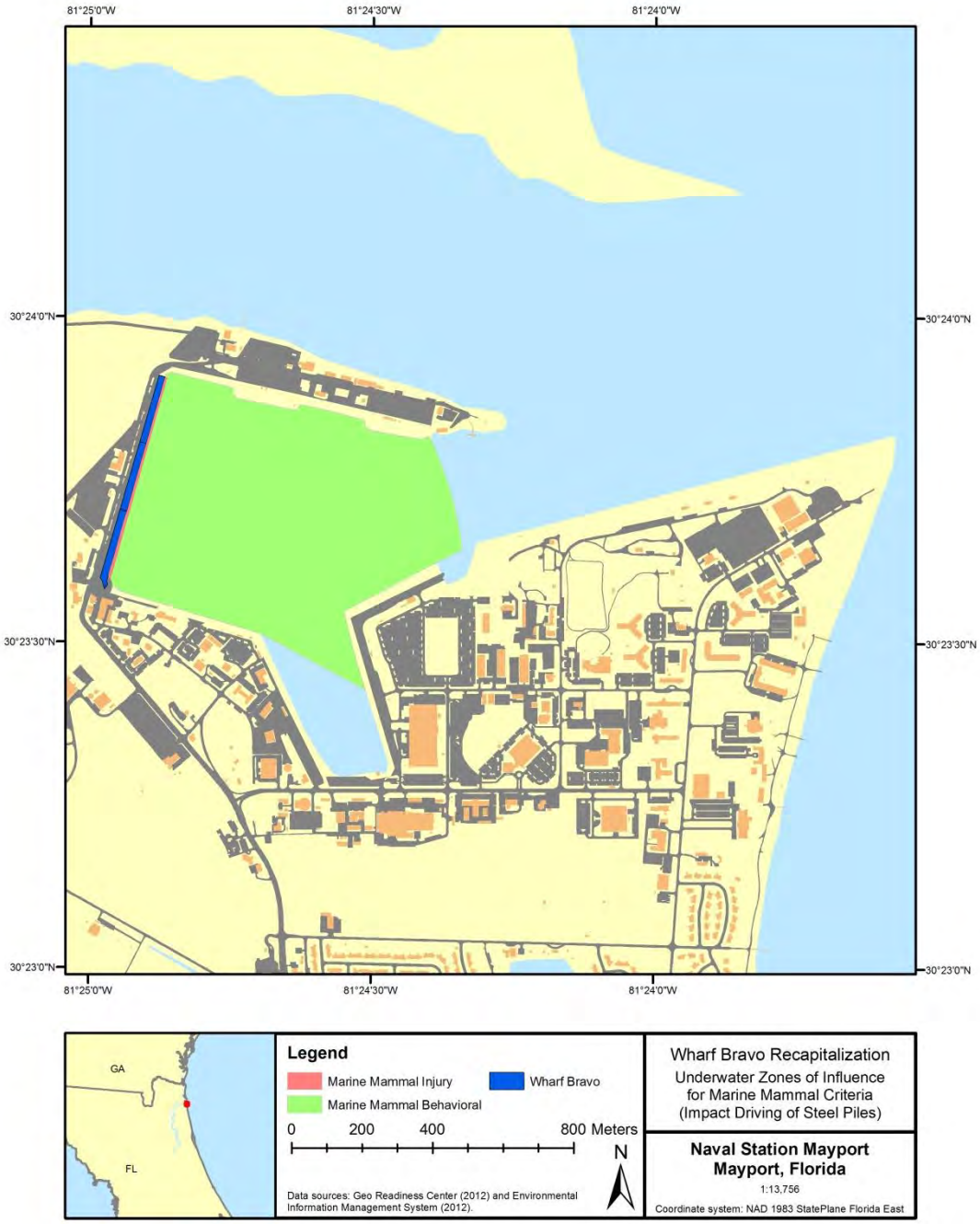
Marine mammal densities were multiplied by the size of the applicable zone of influence to estimate number of incidental takes per day. This number was multiplied by the estimated number of pile-driving days and rounded to the nearest whole number to calculate takes for the entire Project (see Chapter 5).

FIGURE 6-1. INJURY AND BEHAVIORAL ZONES OF INFLUENCE FOR MARINE MAMMALS[1] - VIBRATORY DRIVING OF STEEL SHEET PILES



[1] Official criteria have not been established for West Indian manatees; marine mammal injury zone of influence illustrated represents a notional pile driving location; injury zone is too small to depict.

FIGURE 6-2. INJURY AND BEHAVIORAL ZONES OF INFLUENCE FOR MARINE MAMMALS[2] - IMPACT DRIVING OF STEEL SHEET PILES (CONTINGENCY ONLY)



[2] Official criteria have not been established for West Indian manatees; marine mammal injury zone of influence illustrated represents a notional pile driving location; injury zone is visible along the front of the wharf.

7. Impacts to Marine Mammal Species or Stocks

The anticipated impact of the activity upon the species or stock of marine mammals

The effects of pile driving noise on marine mammals depend on several factors, including:

- Type, depth, intensity, and duration of the pile driving sound,
- the species,
- size of the animal and its proximity to the source,
- depth of the water column,
- substrate of the habitat, and
- sound propagation properties of the environment.

Impacts to marine mammals from pile driving activities are expected to result primarily from acoustic pathways. As such, the degree of effect is intrinsically related to the received level and duration of the sound exposure, which are in turn influenced by the distance between the animal and the source. The farther away from the source, the less intense the exposure will be. The substrate and depth of the habitat affect the sound propagation properties of the environment. Shallow environments are typically more structurally complex, which leads to rapid sound attenuation. In addition, substrates that are soft (i.e., sand), such as those in the turning basin, will absorb and attenuate the sound more readily than hard substrates (rock) which may reflect the acoustic wave. Soft porous substrates will also likely require less time to drive the pile, and possibly less forceful equipment, which would ultimately decrease the intensity of the acoustic source to other locations.

Potential behavioral disturbances are modeled to occur, but the type and severity of these disturbances are difficult to define due to individual differences in response and limited studies addressing the behavioral effects of sounds on marine mammals. The behavioral responses with greatest potential to occur during the proposed Project are habituation and temporary relocation (Ridgway et al. 1997; Finneran et al. 2003; Wartzok et al. 2003). The time required to drive each pile by vibratory methods would be less than 60 seconds. When using impact methods, approximately 20 strikes (less than 10 minutes of driving) would be necessary to drive each pile to depth. Given these durations, the potential behavioral disturbances are anticipated to be discreet and brief.

7.1.Potential Physiological Responses

No Level A exposures are expected because of the mitigation measures outlined in Chapter 11 and the conservative modeling assumptions discussed in Chapter 5, but if they occurred, they would be the result of physiological responses to both the type and strength of the acoustic signature (Viada et al. 2008). The only possibility for Level A exposures would be during impact pile driving, and that method would only be used as a contingency in cases when vibratory driving is insufficient (a similar project that has been completed at adjacent Wharf C-1 required

impact pile driving on only seven piles, which required less than two days). Such potential exposures would be mitigated through monitoring, and are not expected to occur. Physiological responses to impact/impulsive sound stimulation range from non-injurious vibration or compression of tissue to injurious tissue trauma, although mitigations would prevent such occurrences during this Project. The Navy is aware of how important such mitigations are and understands the risks of injury associated with impulsive sounds. Sound-related trauma can be lethal or sub lethal; lethal impacts are those resulting in immediate death or serious debilitation in or near an intense sound source (Ketten 1995). Ears are the most sensitive organ to pressure and are the organs most sensitive to injury (Ketten 2000). Sub lethal damage to the ear from a pressure wave can rupture the tympanum, fracture the ossicles, and damage the cochlea, cause hemorrhage, or cause leakage of cerebrospinal fluid into the middle ear (Ketten 1995). Sub lethal impacts also include hearing loss, which is caused by exposure to perceptible sounds. Moderate injury implies partial hearing loss. Permanent hearing loss (PTS) can occur when the hair cells of the ear are damaged by a very loud event, as well as by prolonged exposure to noise. PTS is classified as an injurious (Level A) exposure. Instances of temporary threshold shifts (TTS) and/or auditory fatigue are well documented in marine mammal literature as being one of the primary avenues of acoustic impact. Temporary loss of hearing sensitivity has been documented in controlled settings using captive marine mammals exposed to strong sound exposure levels at various frequencies (Ridgway et al. 1997; Kastak et al. 1999; Finneran et al. 2005). While injuries to other sensitive organs are possible, they are less likely since pile driving impacts are almost entirely acoustically mediated, versus explosive sounds which also include a shock wave resulting in damage.

7.2.Potential Behavioral Responses

The intent of the proposed project is to accomplish all pile driving using vibratory pile driving. Impact pile driving would only be used as a contingency in cases when vibratory driving is insufficient (a similar project that has been completed at adjacent Wharf C-1 required impact pile driving on only seven piles, which required less than two days). The time required to drive each pile by vibratory methods would be less than sixty seconds, so potential behavioral disturbances are anticipated to be discreet and brief.

Studies of marine mammal responses to vibratory pile driving are limited, but suggest the potential for behavioral disturbance. Marine mammal monitoring at the Port of Anchorage marine terminal redevelopment project (a location with generally high background noise levels [~125 dB rms])found no response by marine mammals swimming within the threshold distances to noise impacts from construction activities including vibratory and impact pile driving (Integrated Concepts & Research Corporation 2009). However, more recent studies of marine mammal distribution and behavior near windfarm development projects have shown changes to short term behavior and distribution of harbor porpoises and bottlenose dolphins (Graham et al. 2017). When behavioral changes occur, they often involve short-term avoidance of the ensonified area, with animals returning to normal distribution within hours to weeks of the noise ceasing. It is worth noting that the studies which detected behavioral changes did not take place in industrial harbors like Naval Station Mayport and had significantly higher source levels than estimated for this project. Habituation may affect the potential for response by animals that are resident to the area encompassing the turning basin.

Responses to impulsive impact pile driving (if it were to be needed) are expected to be more acute than response to continuous vibratory driving. Controlled experiments with captive marine mammals showed pronounced behavioral reactions, including avoidance of loud sound sources (Ridgway et al. 1997; Finneran et al. 2003). Observed responses of wild marine mammals to loud impulsive sound sources, including seismic airguns and impact pile driving during construction of windfarms, have been varied, but often consist of avoidance behavior or other behavioral changes suggesting discomfort (Morton and Symonds 2002; Dähne et al. 2013; Russell et al. 2016; also see reviews in Gordon et al. 2004; Wartzok et al. 2003; and Nowacek et al. 2007). Source levels from these studies are also much higher than those for this project; lower source levels may lead to decreases in the probability or severity of observed responses.

Regardless of the source, potential behavioral responses to sound are highly variable. The magnitude of each potential behavioral change ultimately determines the severity of the response. A number of factors may influence an animal's response to noise, including its previous experience, its auditory sensitivity, its biological and social status (including age and sex), and its behavioral state and activity at the time of exposure.

A comprehensive review of acoustic and behavioral responses to noise exposure by Nowacek et al. (2007) concluded one of the most common responses is displacement. To assess the significance of displacements, it is necessary to know the areas to which the animals relocate, the quality of that habitat, and the duration of the displacement in the event they return to the pre-disturbance area. Short-term displacement may not be of great concern unless the disturbance happens repeatedly; due to the short duration of this project, chronic displacement of bottlenose dolphins is not expected. Similarly, long-term displacement may not be of concern if adequate replacement habitat is available. The affected habitat within the basin is highly developed and experiences a high level of human use and anthropogenic noise from vessels and port activities, making it poor quality for resting, socializing, and foraging. Animals utilizing this habitat are likely already habituated to most anthropogenic disturbances including pile driving, which has been repeatedly conducted in the basin over the last several years. Potential disturbances due to the proposed pile driving are expected to be intermittent and brief, and animals are expected to return to the area when the pile driving is complete.

Marine mammals exposed to pile driving sound over the course of the Project would likely avoid affected areas if they experience noise-related discomfort. As described in the section above, individual responses to pile driving noise are expected to be variable. Some individuals may occupy the Project area during pile driving without apparent discomfort while others may be displaced with undetermined long-term effects. Avoidance of the affected area during pile driving operations would reduce or eliminate the likelihood of injury impacts, but would also reduce access to foraging areas, although whether or not foraging opportunities in the Project area are better than in areas outside the ZOI is not known. Noise-related disturbance may also inhibit some marine mammals from entering / exiting the turning basin. Given the duration of the project there is a potential for displacement of marine mammals from the affected area due to these behavioral disturbances during the in-water work period. However, the time required to drive each pile by vibratory methods would be less than sixty seconds, so potential behavioral disturbances are anticipated to be discreet and brief. Further, since pile driving will only occur

during daylight hours, marine mammals transiting the activity area or foraging or resting in the project area at night will not be affected.

Habituation is a response that occurs when an animal's reaction to a stimulus wanes with repeated exposure, usually in the absence of unpleasant associated events (Wartzok et al. 2003). Animals are most likely to habituate to sounds that are predictable and unvarying. The opposite process is sensitization—when an unpleasant experience leads to subsequent responses, often in the form of avoidance, at a lower level of exposure. Behavioral state or differences in individual tolerance levels may affect the type of response as well. For example, animals that are resting may show greater behavioral change in response to disturbing noise levels than animals that are highly motivated to remain in an area for feeding (Richardson et al. 1995; National Research Council 2003; Wartzok et al. 2003). Indicators of disturbance may include sudden changes in the animal's behavior or avoidance of the affected area. A marine mammal may show signs that it is startled by the noise and/or it may swim away from the sound source and avoid the area. Increased surfacing time and temporary cessation of foraging in the project area could indicate disturbance or discomfort in marine mammals.

Effects of pile driving activities will be experienced by individual marine mammals, but will not cause population-level impacts or affect the continued survival of the species because the brief and intermittent nature of pile driving is unlikely to cause long term disruptions to biologically significant behaviors important for survival (e.g. foraging, mating).

7.3. Conclusions Regarding Impacts to Species or Stocks

Individual marine mammals may be exposed to high sound pressure levels during pile removal and installation, which may result in Level B behavioral harassment. Any marine mammals exposed (harassed) may change their normal behavior patterns (i.e., swimming speed, foraging habits, etc.) or be temporarily displaced from the area of construction. Any exposures will likely have only a minor effect on individuals and no effect on their populations. The sound generated from vibratory pile driving is non-impulsive, which is not known to cause injury to marine mammals, and mitigations are in place to ensure injury does not occur. Each discreet vibratory pile driving action is also brief, requiring less than sixty seconds to completely drive a pile. Impact pile driving is anticipated to be seldom used, and only when vibratory driving is insufficient (a similar project that has been completed at adjacent Wharf C-1 required impact pile driving on only seven piles, which required less than two days) and mitigation is expected to prevent adverse physiological impacts to marine mammals from impact pile driving. Nevertheless, potential behavioral disturbances are unavoidable. The expected level of unavoidable exposure (defined as acoustic harassment) is presented in Chapter 6. This level of effect is not anticipated to have any adverse impact to North Atlantic right whales', humpback whales', Atlantic spotted dolphins', or bottlenose dolphins' population recruitment, survival, or recovery (in the case of listed species).

8. Impact on Subsistence Use

The anticipated impact of the activity on the availability of the species or stock of marine mammals for subsistence uses.

Potential marine mammal disturbances resulting from the Project will be limited to populations for which there is no known historic or current subsistence use. Therefore, no impacts on the availability of species or stocks for subsistence use are considered.

9. Impacts to Marine Mammal Habitat and the Likelihood of Restoration

The anticipated impact of the activity upon the habitat of the marine mammal populations, and the likelihood of restoration of the affected habitat.

Activities associated with the Project are expected to result in removal of a small amount of low-quality habitat in the turning basin between the new and existing bulkheads, and disturb sediments, and benthic and forage fish communities, on a temporary, highly localized scale. The turning basin is dredged regularly to allow for deep draft naval ships' berthing; the last dredging took place during the spring of 2015. This, combined with the amount of vessel traffic in the relatively confined space of the turning basin and the transition to the federal navigation channel, has resulted in a determination the Bravo Wharf project area encompasses relatively low quality habitat for most marine species.

Pile installation and deployment of anchors and / or spuds from barges may result in temporary, small scale disturbance of benthic communities and marine vegetation in the immediate vicinity of the project. Benthic organisms may be disturbed, buried or crushed by anchors and / or spuds and removal of piles; this may result in a temporary degradation or loss of isolated foraging habitat for marine mammals. However, sediments and marine vegetation are expected to return to their prior conditions and cover within a short time of the conclusion of the in-water work.

The new surfaces associated with the piles and exposed concrete will likely result in establishment of fouling communities on Bravo Wharf itself, and may attract fish and benthic organisms resulting in very small scale shifts in prey distribution.

Overall, small-scale, temporary changes to habitat and community assemblages in the immediate project area are expected to occur, but natural sedimentation and succession / recruitment will likely return the project footprint to pre-construction conditions within a short amount of time after in-water work is completed.

10. Impacts to Marine Mammals from Loss or Modification of Habitat

The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved.

The Project is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual or populations of marine mammals because of the relatively small footprint and existing disturbed conditions. Further, all impacts will be temporary, with in-water pile driving work being completed in a maximum of 40 days. Information provided in Chapter 9 (Impacts on Marine Mammal Habitat and the Likelihood of Restoration) indicates there may be temporary impacts, but those impacts would be limited to the immediate area within the turning basin. Impacts will cease upon the completion of activities associated with the Project.

11. Means of Affecting the Least Practicable Adverse Impacts – Minimization Measures

The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of affecting the least practicable adverse impact upon the affected species or stocks, their habitat, and on their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance.

The Navy shall employ the measures listed in this section to avoid and minimize impacts to marine mammals and their habitats. Best Management Practices (BMPs) are intended to avoid and minimize potential environmental impacts. BMPs and minimization measures are included in the construction contract plans and specifications and must be agreed upon by the contractor prior to any construction activities. Upon signing the contract, it becomes a legal agreement between the contractor and the Navy. Failure to follow the prescribed BMPs and minimization measures is a contract violation.

As specified in Chapter 13 of this document, a separate monitoring plan has been submitted for this project; please refer to that document for additional details.

General Construction Best Management Practices

1. All work shall adhere to performance requirements of the Clean Water Act, Section 404 permit and Section 401 Water Quality Certification. No in-water work shall begin until after issuance of regulatory authorizations.
2. The construction contractor is responsible for preparation of an Environmental Protection Plan. The plan shall be submitted and implemented prior to the commencement of any construction activities and is a binding component of the overall contract. The plan shall identify construction elements and recognize spill sources at the site. The plan shall outline BMPs, responsive actions in the event of a spill or release, and notification and reporting procedures. The plan shall also outline contractor management elements such as personnel responsibilities, project site security, site inspections, and training.
3. No petroleum products, lime, chemicals, or other toxic or harmful materials shall be allowed to enter surface waters.
4. Washwater resulting from washdown of equipment or work areas shall be contained for proper disposal, and shall not be discharged unless authorized.
5. Equipment that enters surface waters shall be maintained to prevent any visible sheen from petroleum products.
6. No oil, fuels, or chemicals shall be discharged to surface waters, or onto land where there is a potential for re-entry into surface waters shall occur. Fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. shall be checked regularly for leaks, and be maintained and stored properly to prevent spills.
7. No cleaning solvents or chemicals used for tools or equipment cleaning shall be discharged to ground or surface waters.

8. Construction materials shall not be stored where high tides, wave action, or upland runoff could cause materials to enter surface waters.
9. Barge operations shall be restricted to tidal elevations adequate to prevent grounding of a barge.

Pile Removal and Installation Best Management Practices

1. A containment boom surrounding the work area shall be used during creosote-treated pile removal to contain and collect any floating debris and sheen. The boom may be lined with oil-absorbing material to absorb released creosote.
2. Oil-absorbent materials shall be used in the event of a spill if any oil product is observed in the water.
3. All creosote-treated material and associated sediments shall be disposed of in a landfill that meets Florida environmental standards.
4. Removed piles and associated sediments (if any) shall be contained on a barge. If a barge is not utilized, piles and sediments may be stored in a containment area near the construction site.
5. Pilings that break or are already broken below the waterline may be removed by wrapping the piles with a cable or chain and pulling them directly from the sediment with a crane. If this is not possible, they shall be removed with a clamshell bucket. To minimize disturbance to bottom sediments and splintering of piling, the contractor shall use the minimum size bucket required to pull out piling based on pile depth and substrate. The clam shell bucket shall be emptied of piling and debris on a contained barge before it is lowered into the water. If the bucket contains only sediment, the bucket shall remain closed and be lowered to the mud line and opened to redeposit the sediment. In some cases (depending on access, location, etc.), piles may be cut below the mud line and the resulting hole backfilled with clean sediment.
6. Any floating debris generated during installation shall be retrieved. Any debris in a containment boom shall be removed by the end of the work day or when the boom is removed, whichever occurs first. Retrieved debris shall be disposed of at an upland disposal site.
7. Whenever activities that generate sawdust, drill tailings, or wood chips from treated timbers are conducted, tarps or other containment material shall be used to prevent debris from entering the water.
8. If excavation around piles to be replaced is necessary, hand tools or a siphon dredge shall be used to excavate around piles to be replaced.

Timing Restrictions

All in-water construction activities shall occur during daylight hours (one hour post sunrise to one hour prior to sunset[3]). Non in-water construction activities could occur between 6:00 AM and 10:00 PM during any time of the year.

[3] Sunrise and sunset are to be determined based on the National Oceanic and Atmospheric Administration data which can be found at http://www.srrb.noaa.gov/highlights/sunrise/sunrise.html.

Additional Minimization Measures for Marine Mammals

The following minimization measures shall be implemented during pile driving to avoid marine mammal exposure to Level A injurious noise levels generated from impact pile driving and to reduce to the lowest extent practicable exposure to Level B disturbance noise levels.

Coordination

The Navy shall conduct a pre-construction briefing with the contractor. During the briefing, all personnel working in the Project area shall watch the Navy's Marine Species Awareness Training video.

Acoustic Minimization Measures

Vibratory installation shall be used to the extent possible to drive steel piles to minimize higher sound pressure levels associated with impact pile driving.

Soft Start

The objective of a soft-start is to provide a warning and / or give animals in close proximity to pile driving a chance to leave the area prior to an impact driver operating at full capacity; thereby, exposing fewer animals to loud underwater and airborne sounds. For impact driving only, a soft start procedure shall be used at the beginning of each day's in-water pile driving or if pile driving has ceased for more than 30 minutes.

The contractor shall provide an initial set of strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent sets. (The reduced energy of an individual hammer cannot be quantified because they vary by individual drivers. Also, the number of strikes will vary at reduced energy because raising the hammer at less than full power and then releasing it results in the hammer "bouncing" as it strikes the pile resulting in multiple "strikes").

Standard Conditions

Conditions in this section include those that will be followed for the protection of all ESA-listed species, not only those being addressed in this application. The contractor will adhere to all requirements of the following:

- 2011 Standard Manatee Conditions for In-Water Work
- Sea Turtle and Smalltooth Sawfish Construction Conditions
- Southeast Regional Marine Mammal and Sea Turtle Viewing Guidelines

Sea Turtle Lighting Conditions

- Lighting on construction equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the nearby marine turtle nesting beach while still being consistent with human safety requirements.

- All permanent exterior lighting fixtures associated with the wharf redevelopment should be assessed by NAVSTA Mayport Environmental Department and designed according to the NAVSTA Mayport Light Management Plan to minimize light contribution to urban sky glow which could be visible from the marine turtle nesting beach.

Visual Monitoring and Shutdown Procedures

A separate Marine Species Monitoring Plan will be submitted to NMFS and USFWS; it includes all details for monitoring. Major components of the monitoring plan are summarized below.

Observers and Procedures

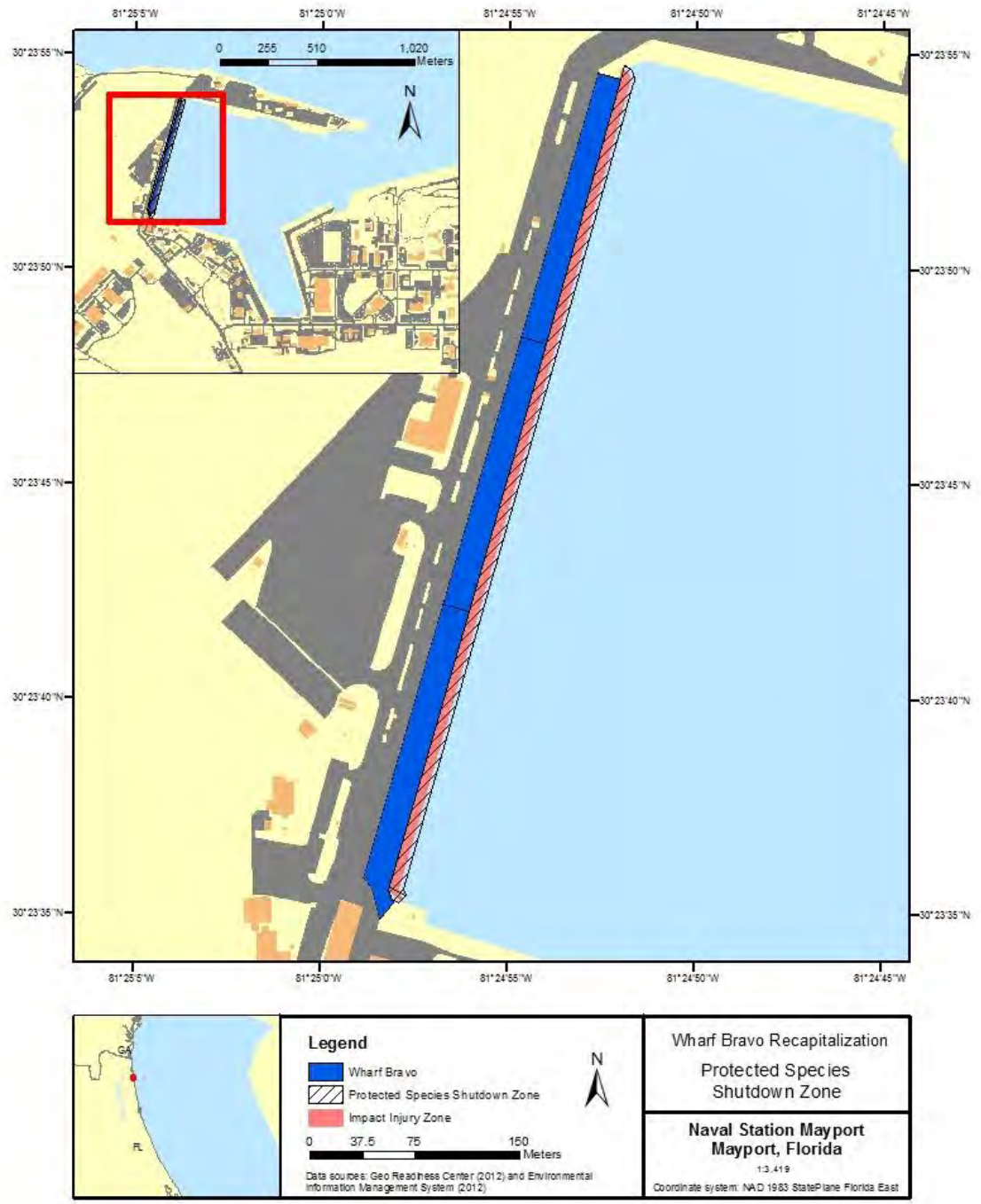
The Navy shall conduct a pre-construction briefing with the contractor. During the briefing, all contractor personnel working in the Project area will watch the Navy's Marine Species Awareness Training video. An informal guide will be included with the Monitoring Plan to aid in identifying species should they be observed in the vicinity of the Project.

At all times during in-water work, two marine species observers ("observers") designated by the contractor will be placed at the best vantage point(s) practicable to monitor for protected species and implement shutdown/delay procedures when applicable by calling for the shutdown to equipment operators. The observers shall have no other construction related tasks while conducting monitoring. Potential locations for the two marine mammal observers include the construction barge and elevated building on Naval Station Mayport with a view of the turning basin.

Methods

The observers will monitor the entire shutdown zone (Figure 11-1) before, during, and after pile driving and removal. The shutdown zone for contingency only impact pile driving was calculated based on acoustic modeling at a notional pile location on the wharf. The zone to be monitored is 7.7 m (26 ft.) in each direction from the pile being driven. However, the shutdown zone for all in-water work (i.e. during vibratory pile driving) will be 15 m (50 ft.) from the pile being driven. The observers will have full visibility of the shutdown zone regardless of the type of driving taking place, and will be able to immediately report a marine mammal observation and initiate shutdown procedures.

FIGURE 11-1. SHUTDOWN ZONES FOR VIBRATORY AND (CONTINGENCY ONLY) IMPACT PILE DRIVING



The observer(s) will be placed at the best vantage point practicable (e.g. from a small boat, construction barges, on shore, or any other suitable location) to monitor for marine species and implement shutdown/delay procedures when applicable by calling for the shutdown to the equipment operator(s). Elevated positions are preferable; it shall be the contractor's responsibility to ensure that appropriate safety measures are implemented to protect observers on elevated observation points. If a boat is used for monitoring, the boat will maintain minimum distances from all species (should they occur) as described in the Southeast Region Marine Mammal and Sea Turtle Viewing Guidelines.

Should any marine mammal not authorized for Level B harassment in this IHA enter the ensonified area, pile driving will cease until the animal(s) leaves the area. Pile driving would resume only after the observer has determined through re-sighting or by waiting 15 minutes that the animal(s) has moved outside the ensonified area.

If a large whale is spotted within or approaching the ensonified area, all in-water construction activity will cease until the animal has been observed outside the zone of influence or until 30 minutes has elapsed without re-sighting the animal.

During all observation periods, observers would use binoculars and the naked eye to search continuously for marine mammals and ESA-listed species (with the exception of fish, which are not likely to be visible from the surface). If the shutdown zone is obscured by fog or poor lighting conditions, pile driving will not be initiated, and will cease if already in progress, until the entire shutdown zone is visible.

Pre-Activity Monitoring

The shutdown zone will be monitored for 15 minutes prior to in-water construction/demolition activities. If a protected species is observed in or approaching the shutdown zone, the activity shall be delayed until the animal(s) leaves the shutdown zone. Activity would resume only after the observer has determined, through re-sighting or by waiting 15 minutes (30 minutes in the case of a large whale) that the animal(s) has moved outside the shutdown zone. The observer(s) will notify the monitoring coordinator/construction foreman / point of contact (POC) when construction activities can commence.

Activity Monitoring

The shutdown zone will always be a minimum of 15 m (50 ft.) to prevent injury from physical interaction of protected species with construction equipment (Figure 11-1).

If a protected species approaches or enters a shutdown zone during any in-water work, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes (30 minutes in the event of a large whale sighting) have passed without re-detection of the animal. Note: protected fish species will not likely be visible to observers at the surface.

Bulkhead sheet pile installation shall be completed only after confirmation that no manatees or marine turtles will be trapped in the area to be filled between the existing and new bulkheads.

Post-Activity Monitoring

Monitoring of the shutdown zone will continue for 30 minutes following the completion of the activity.

Data Collection

The following information will be collected on sighting forms used by observers:

- Date and time that pile driving or removal begins or ends
- Construction activities occurring during each observation period
- Weather parameters identified in the acoustic monitoring (e.g., wind, temperature, percent cloud cover, and visibility)
- Tide and sea state

If a protected species approaches or enters the shutdown zone, the following information will be recorded once shutdown procedures have been implemented:

- Species, numbers, and if possible sex and age class of the species
- Behavior patterns observed, including bearing and direction of travel
- Location of the observer and distance from the animal(s) to the observer

If possible, photographs of the animal(s) will be taken and forwarded to the Naval Facilities Engineering Command Southeast Environmental point of contact.

Data collection forms shall be furnished to the Environmental point of contact within a mutually agreeable timeframe.

Interagency Notification

If the Navy encounters an injured, sick, or dead marine mammal, NMFS will be notified immediately. Such sightings will be called into the NMFS Stranding Coordinator for the Southeast:

Erin Fougeres, Ph.D.
Marine Mammal Stranding Program Administrator
NOAA Fisheries
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701
e-mail: erin.fougeres@noaa.gov
office: 727-824-5323
fax: 727-824-5309

The Navy will provide NMFS with the species or description of the animal(s), the condition of the animal (including carcass condition if the animal is dead), location, the date and time of first discovery, observed behaviors (if alive), and photo or video (if available).

In preservation of biological materials from a dead animal, the finder (i.e. marine mammal observer) has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. Observers should not handle dead animals.

Reporting

A draft report of any incidents of marine mammals entering the shutdown zone will be forwarded to NMFS / USFWS no later than 31 July 2019. A final report would be prepared and submitted to NMFS within 30 days following receipt of comments on the draft report from NMFS.

12. Minimization of Adverse Effects on Subsistence Use

Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, the applicant must submit either a plan of cooperation or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses. A plan must include the following:

(i) A statement that the applicant has notified and provided the affected subsistence community with a draft plan of cooperation;

(ii) A schedule for meeting with the affected subsistence communities to discuss proposed activities and to resolve potential conflicts regarding any aspects of either the operation or the plan of cooperation;

(iii) A description of what measures the applicant has taken an/or will take to ensure that proposed activities will not interfere with subsistence whaling or sealing; and

(iv) What plans the applicant has to continue to meet with the affected communities, both prior to and while conducting activity, to resolve conflicts and to notify the communities of any changes in the operation.

As detailed in Chapter 8, no impacts on the availability of species or stocks for subsistence use are considered. Therefore, no minimization efforts are applicable.

13. Monitoring and Reporting Measures

The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.

A separate Marine Species Monitoring Plan is being submitted to NMFS. It includes all details for Project monitoring efforts.

14. Research

Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.

At this time the Navy does not anticipate any specific research conducted in conjunction with the Project.

The Navy strives to be a world leader in marine species research and has provided more than $100 million over the past five years to universities, research institutions, federal laboratories, private companies, and independent researchers around the world to increase the understanding of marine species physiology and behavior with several projects ongoing in Washington.

The Navy sponsors 70 percent of all U.S. research concerning the effects of human-generated sound on marine mammals and 50 percent of such research conducted worldwide. Major topics of Navy-supported research include the following:

- Gaining a better understanding of marine species distribution and important habitat areas
- Developing methods to detect and monitor marine species before and during training
- Understanding the effects of sound on marine mammals
- Developing tools to model and estimate potential effects of sound

The Navy has sponsored several workshops to evaluate the current state of knowledge and potential for future acoustic monitoring of marine mammals. The workshops brought together acoustic experts and marine biologists from the Navy and outside research organizations to present data and information on current acoustic monitoring research efforts and to evaluate the potential for incorporating similar technology and methods into Navy activities. The Navy supports research efforts on acoustic monitoring and will continue to investigate the feasibility of passive acoustics as a potential monitoring tool. Overall, the Navy will continue to research and contribute to university/external research to improve the state of the science regarding marine species biology and acoustic effects. These efforts include monitoring programs, data sharing with NMFS from research and development efforts, and future research as previously described.

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Appendix A

Standard Manatee Conditions for In-Water Work

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or in Vero Beach (1-772-562-3909) for south Florida, and emailed to FWC at ImperiledSpecies@myFWC.com.

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8½ " by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at http://www.myfwc.com/WILDLIFEHABITATS/manatee_sign_vendors.htm. Questions concerning these signs can be forwarded to the email address listed above.

CAUTION: MANATEE HABITAT

All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:

Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC

Appendix B

Fundamentals of Acoustics

Bioacoustics, or the study of how sound affects living organisms, is a complex and interdisciplinary field that includes the physics of sound production and propagation, the source characteristics of sounds, and the perceptual capabilities of receivers. This appendix is intended to introduce the reader to the basics of sound measurements and sound propagation, as well as the hearing and vocal production abilities of species that may occur in the project area. The potential for noise from pile driving to cause auditory masking for marine mammals within the project area is also considered.

B.1 Fundamentals of Acoustics

Sound is an oscillation in pressure, particle displacement, or particle velocity, as well as the auditory sensation evoked by these oscillations, although not all sound waves evoke an auditory sensation (i.e., they are outside of an animal's hearing range) (ANSI S1.1-1994). Sound may be described in terms of both physical and subjective attributes. Physical attributes may be directly measured. Subjective (or sensory) attributes cannot be directly measured and require a listener to make a judgment about the sound. Physical attributes of a sound at a particular point are obtained by measuring pressure changes as sound waves pass. The following material provides a short description of some of the basic parameters of sound.

Sound can be characterized by several factors, including frequency, intensity, and pressure (Richardson et al. 1995). Sound frequency (measured in Hertz [Hz]) and intensity (amount of energy in a signal [Watts per meter^2]) are physical properties of the sound which are related to the subjective qualities of pitch and loudness (Kinsler et al. 1999). Sound intensity and sound pressure (measured in Pascals [Pa]) are also related; of the two, sound pressure is easier to measure directly, and is therefore more commonly used to evaluate the amount of disturbance to the medium caused by a sound ("amplitude").

Because of the wide range of pressures and intensities encountered during measurements of sound, a logarithmic scale known as the decibel is used to evaluate these properties; in acoustics, "level" indicates a sound measurement in decibels. The decibel [dB] scale expresses the logarithmic strength of a signal (pressure or intensity) relative to a reference value of the same units. This document reports sound levels with respect to sound pressure only. Each increase of 20 dB reflects a ten-fold increase in signal pressure, i.e., an increase of 20 dB means ten times the pressure, 40 dB means one hundred times the pressure, 60 dB means one thousand times the pressure, and so on.

The sound levels in this document are given as sound pressure levels [SPL]. For measurements of underwater sound, the standard reference pressure is 1 microPascal [µPa, or 10^{-6} Pascals], and is expressed as "dB re 1µPa". For airborne sounds, the reference value is 20 µPa, expressed as "dB re 20 µPa". Sound levels measured in air and water are not directly comparable, and it is important to note which reference value is associated with a given sound level.

Airborne sounds are commonly referenced to human hearing using a method which weights sound frequencies according to measures of human perception, de-emphasizing very low and very high frequencies which are not perceived well by humans. This is called A-weighting, and the decibel level measured is called the A-weighted sound level [dBA]. A similar method has been proposed for evaluating underwater sound levels with respect to marine mammal hearing. While preliminary weighting functions for marine mammal hearing have been developed

(Southall et al. 2007), they are not yet applied to sound exposure from pile driving activities. Therefore, underwater sound levels given in this document are not weighted and evaluate all frequencies equally.

Table D-1 summarizes common acoustic terminology. Two of the most common descriptors are the instantaneous peak SPL and the root-mean-square [rms] SPL. The peak SPL is the instantaneous maximum or minimum over- or underpressure observed during each sound event and is presented in dB re 1 µPa peak. The rms level is the square root of the energy divided by a defined time period, given as dB re 1 µPa rms.

Table B-1. Definitions of Acoustical Terms

Term	Definition
Decibel [dB]	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure or intensity of the sound measured to the appropriate standard reference value. This document uses only sound pressure measurements to calculate decibel levels. The reference pressure for water is 1 microPascal (µPa) and for air is 20 µPa (approximate threshold of human audibility).
Sound Pressure Level [SPL]	Sound pressure is the force per unit area, usually expressed in microPascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. Sound pressure level is the quantity that is directly measured by a sound level meter, and is expressed in decibels referenced to the appropriate air or water standard.
Frequency, Hz	Frequency is expressed in terms of oscillations, or cycles, per second. Cycles per second are commonly referred to as Hertz (Hz). Typical human hearing ranges from 20 Hz to 20,000 Hz; hearing ranges in non-humans are widely variable and species specific.
Peak Sound Pressure (unweighted), dB re 1µPa peak	The maximum absolute value of the instantaneous sound pressure expressed as dB re 1µPa peak.
Root-Mean-Square [rms], dB re 1µPa	The rms level is the square root of the pressure divided by a defined time period, expressed in decibels. For impulsive sounds, the rms has been defined as the average of the squared pressures over the time that comprise that portion of waveform containing 90 percent of the sound energy for one impact pile driving impulse. For non-impulsive sounds, rms energy represents the average of the squared pressures over the measurement period and is not limited by the 90 percent energy criterion. Expressed as dB re 1µPa.
Sound Exposure Level [SEL], dB re 1µPa^2 sec	Sound exposure level is a measure of energy. Specifically, it is the dB level of the time integral of the squared-instantaneous sound pressure, normalized to a 1-second period. It can be an extremely useful metric for assessing cumulative exposure because it enables sounds of differing duration to be compared in terms of total energy.
Waveforms, µPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of µPa over time (i.e., seconds).
Frequency Spectra, dB over frequency range	A graphical plot illustrating the frequency content over a given frequency range. Bandwidth is generally defined as linear (narrowband) or logarithmic (broadband) and is stated in frequency (Hz).
A-Weighted Sound Level, dBA	A frequency-weighted measure used for airborne sounds only. A-weighting de-emphasizes the low and high frequency components of a given sound in a manner similar to the frequency response of the human ear and correlates well with subjective human reactions to noise. A-weighted levels are referenced to 20 µPa unless otherwise noted.

Term	Definition
Ambient Noise Level	The background noise level, which is a composite of sounds from all sources near and far. The normal or existing level of environmental noise at a given location, given in dB referenced to the appropriate pressure standard.

Adapted and derived from URS Corporation (2007)

B.2 Sound vs. Noise

Sound may be purposely created to convey information, communicate, or obtain information about the environment. Examples of such sounds are sonar pings, marine mammal vocalizations/echolocations, tones used in hearing experiments, and small sonobuoy explosions used for submarine detection.

Noise is undesired sound (ANSI S1.1-1994). Whether a sound is noise depends on the receiver (i.e., the animal or system that detects the sound). For example, small explosives and sonar used to locate an enemy submarine produce *sound* that is useful to sailors engaged in anti-submarine warfare, but is likely to be considered undesirable *noise* by marine mammals. Sounds produced by naval aircraft and vessel propulsion are considered noise because they represent possible energy inefficiency and increased detectability, which are undesirable.

Noise also refers to all sound sources that may interfere with detection of a desired sound and the combination of all of the sounds at a particular location (ambient noise).

B.3 Description of Noise Sources

Ambient noise in the project area is a composite of sounds from natural sources, normal port activities, and temporary projects such as maintenance dredging or pile driving. Ambient noise in the Mayport turning basin is addressed in Chapter 5 of the IHA Application.

In-water construction activities associated with this project include vibratory and impact pile driving. The sounds produced by these activities fall into two sound types: impulsive (impact driving) and non-impulsive (vibratory driving). Distinguishing between these two general sound types is important because of each sound type may cause different types of physical effects, particularly with regard to hearing (Ward 1997).

Impulsive sounds (e.g., explosions, seismic airgun pulses, and impact pile driving) are referred to as pulsed sounds in Southall et al. (2007), and are brief, broadband, atonal transient sounds which can occur as isolated events or be repeated in some succession (Southall et al. 2007). Impulsive sounds are characterized by a relatively rapid rise from ambient pressure to a maximal pressure value followed by a decay period that may include a period of diminishing, oscillating maximal and minimal pressures (Southall et al. 2007). Impulsive sounds generally have a greater capacity to induce physical injury compared with sounds that lack these features (Southall et al. 2007).

Non-impulsive sounds ("non-pulsed" in Southall et al. 2007) can be tonal, broadband, or both. They lack the rapid rise time and can have longer durations than impulsive sounds. Non-impulsive sounds can be either intermittent or continuous sounds. Examples of non-impulsive sounds include vessels, aircraft, and machinery operations such as drilling, dredging, and vibratory pile driving (Southall et al. 2007).

In environments with non-porous boundaries (i.e. rock seafloor, rigid sides, etc.), reverberation may extend the duration of both impulsive and non-impulsive sounds.

B.4 Vocalization and Hearing of Marine Mammals

All marine mammals that have been studied can produce sounds and use sounds to forage, orient, detect and respond to predators, and facilitate social interactions (Richardson et al., 1995). Measurements of marine mammal sound production and hearing capabilities provide some basis for assessing whether exposure to a particular sound source may affect a marine mammal behaviorally or physiologically. Marine mammal hearing abilities are quantified using live animals either via behavioral audiometry or electrophysiology (see Schusterman 1981; Au 1993; Wartzok and Ketten 1999; Nachtigall et al. 2007). Behavioral audiograms, which are plots of animals' exhibited hearing threshold versus frequency, are obtained from captive, trained live animals using standard testing procedures with appropriate controls, and are considered to be a more accurate representation of a subject's hearing abilities. Behavioral audiograms of marine mammals are difficult to obtain because many species are too large, too rare, and too difficult to acquire and maintain for experiments in captivity. Consequently, our understanding of a species' hearing ability may be based on the behavioral audiogram of a single individual or small group of animals. In addition, captive animals may be exposed to local ambient sounds and other environmental factors that may impact their hearing abilities and may not accurately reflect the hearing abilities of free-swimming animals. For animals not available in captive or stranded settings (including large whales and rare species), estimates of hearing capabilities are made based on anatomical and physiological structures, the frequency range of the species' vocalizations, and extrapolations from related species.

Electrophysiological audiometry measures small electrical voltages produced by neural activity when the auditory system is stimulated by sound. The technique is relatively fast, does not require a conscious response, and is routinely used to assess the hearing of newborn humans. It has recently been adapted for use on non-humans, including marine mammals (Dolphin, 2000). For both methods of evaluating hearing ability, hearing response in relation to frequency is a generalized U-shaped curve or audiogram showing the frequency range of best sensitivity (lowest hearing threshold) and frequencies above and below with higher threshold values.

Direct measurement of hearing sensitivity exists for approximately 25 of the nearly 130 species of marine mammals. Table provides a summary of sound production and hearing capabilities for marine mammal species in the Project Area. For purposes of this analysis, marine mammals are arranged into the following functional hearing groups based on their generalized hearing sensitivities: high-frequency cetaceans, mid-frequency cetaceans, low-frequency cetaceans (mysticetes), phocid pinnipeds (true seals), otariid pinnipeds (sea lions and fur seals); of these, only mid- and low-frequency cetaceans occur in the Project Area.

Table B-2. Hearing and Vocalization Ranges for Marine Mammal Functional Hearing Groups and Species Potentially Occurring within the Project Area

Functional Hearing Group	Species	Sound Production		General Hearing Ability Frequency Range
		Frequency Range	Source Level (dB re 1 µPa @ 1 m)	
Mid-Frequency Cetaceans	Bottlenose dolphin	100 Hz to 100kHz	137 to 236	150 Hz to 160 kHz
Low-Frequency Cetaceans	North Atlantic right whale; humpback whale	10 Hz to 20 kHz	137 to 192	7 Hz to 22 kHz

Adapted and derived from Southall et al. (2007) and Richardson et al. (1995)
dB re 1 µPa @ 1 m: decibels (dB) referenced to (re) 1 micro (µ) Pascal (Pa) at 1 meter; Hz: Hertz; kHz: kilohertz

B.4.1 Auditory Masking

Natural and artificial sounds can disrupt behavior by auditory masking, or interfering with a marine mammal's ability to detect and interpret other relevant sounds, such as communication and echolocation signals (Wartzok et al. 2004). Masking occurs when both the signal and masking sound have similar frequencies and either overlap or occur very close to each other in time. A signal is very likely to be masked if the noise is within a certain "critical bandwidth" around the signal's frequency and its energy level is similar or higher (Holt 2009). Noise within the critical band of a marine mammal signal will show increased interference with detection of the signal as the level of the noise increases (Wartzok et al. 2004). In delphinid subjects, for example, relevant signals needed to be 17 to 20 dB louder than masking noise at frequencies below 1 kHz in order to be detected and 40 dB greater at approximately 100 kHz (Richardson et al. 1995). Noise at frequencies outside of a signal's critical bandwidth will have little to no effect on the detection of that signal (Wartzok et al. 2004).

Additional factors influencing masking are the temporal structure of the noise and the behavioral and environmental context in which the signal is produced. Continuous noise is more likely to mask signals than intermittent noise of the same amplitude; quiet "gaps" in the intermittent noise allow detection of signals which may not be detectable during continuous noise (Brumm and Slabbekoorn, 2005). The behavioral function of a vocalization (e.g. contact call, group cohesion vocalization, echolocation click, etc.) and the acoustic environment at the time of signaling may both influence call source level (Miksis-Olds and Tyack, 2009; Holt et al. 2011), which directly affects the chances that a signal will be masked (Nemeth and Brumm, 2010).

Noise from anthropogenic sources could cause masking of vocalizations which may rise to the level of behavioral harassment (as defined by the MMPA) if it disrupts communication, echolocation, or other hearing-dependent behaviors. Impact pile driving produces high-amplitude low-frequency noise (10 – 2,000 Hz), which is likely to be audible to all three marine mammal species considered, and is likely to overlap the vocalizations of low-frequency cetaceans (North Atlantic right and humpback whales; Table D-2). While the amplitude of impact pile driving noise may exceed marine mammal vocalization amplitudes within an unknown range of the driven pile, impact pile driving noise is unlikely to entirely mask social (non-echolocation)

signals due to the intermittent nature impact pile driving noise and the limited duration of impact pile driving associated with this project. Impact pile driving will be conducted only in the rare event that an obstruction is encountered during vibratory pile driving, and will be limited to a maximum of 20 strikes per day. We therefore estimate that the likelihood of noise from impact pile driving masking signals important to the behavior and survival of any of the three marine mammal species in the project area is negligible.

Vibratory pile driving produces frequencies from 10 Hz to 2 kHz, which would be within the range of audible sound and vocal production (see Table D-2) for all marine mammal species that may occur in the project area. Given the source levels (151 – 180 dB rms re 1 μPa at 10m) and frequency range (10 – 2,000 Hz) of vibratory pile driving noise (Illingworth & Rodkin 2012), we estimate that any masking event that could rise to Level B harassment under the MMPA would occur within the zones of behavioral harassment estimated for vibratory pile driving (see Chapter 5 in the IHA Application) (Parks et al. 2011). Therefore, potential masking effects are not considered separately in this IHA application.

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Appendix C:

Final Dolphin Survey Results, Density Estimates, and Take Calculations Supporting Future Wharf Recapitalization Projects Within the Naval Station Mayport Turning Basin, Mayport, Florida

FINAL

DOLPHIN SURVEY RESULTS, DENSITY ESTIMATES, AND *TAKE* CALCULATIONS SUPPORTING FUTURE WHARF RECAPITALIZATION PROJECTS WITHIN THE NAVAL STATION MAYPORT TURNING BASIN, MAYPORT, FLORIDA

Prepared for:

Department of the Navy
Naval Facilities Engineering Command Southeast
and
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June 2014

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

JES	Jacksonville Estuarine System
CV	Coefficient of Variance
dB	decibels
DON	Department of the Navy
ESA	Endangered Species Act
ft	feet
km	kilometers
km^2	square kilometers
NOAA	National Oceanic and Atmospheric Administration
M	meters
mm	millimeters
MMPA	Marine Mammal Protection Act
MSF	Magnetic Silencing Facility
NAVFAC	Naval Facilities Engineering Command
NAVSTA	Naval Station
Navy	Department of the Navy
NS	Naval Station
OPS	Operations
PBA	Programmatic Biological Assessment
PSO	Protected Species Observer
PPSO	Primary Protected Species Observer
re	referenced
rms	root mean square
SE	Southeast
SPSO	Secondary Protected Species Observer
U.S.	United States
µPa	microPascal

SECTION 1.0
INTRODUCTION

1.0 INTRODUCTION

The Department of Navy (DON or Navy) has prepared the *Programmatic Biological Assessment for Harbor Maintenance and Repairs within the Mayport Turning Basin, Naval Station Mayport, Mayport, Florida* (DON 2014a) in support of the Endangered Species Act (ESA) Section 7 consultations and conferences for the recapitalization, replacement, repair, and maintenance of infrastructure associated with the fenced-in area of the turning basin at Naval Station (NAVSTA) Mayport. The Mayport programmatic biological assessment (Mayport PBA) also addresses maintenance of infrastructure associated with the Magnetic Silencing Facility (MSF) located in the entrance channel, as well as routine installation actions and activities (NAVSTA Mayport Study Area). In order to assess the magnitude, duration, and degree of any potential impacts from the project activities on marine mammals in support of the Marine Mammal Protection Act (MMPA), particularly bottlenose dolphin (*Tursiops truncates*), the Navy conducted bottlenose dolphin surveys of the NAVSTA Mayport Turning Basin; other marine species were also recorded if observed. This report describes the marine mammal species and survey methodology, presents survey results, and discusses density estimates of bottlenose dolphins in the NAVSTA Mayport Turning Basin. This report also includes a discussion of the resulting *take* estimates and calculation logic associated with future wharf recapitalization projects within the NAVSTA Mayport Turning Basin. An Excel spreadsheet capturing these density estimates and *take* calculations has been developed and submitted as an addendum to this report as well.

1.1 Background

NAVSTA Mayport is located in northern Florida east of Jacksonville along the St. Johns River and the Atlantic Ocean in Duval County, Florida (Figure 1-1). NAVSTA Mayport maintains and operates facilities that provide support to the operations of deploying home-based and transient Navy ships, aviation units, and staff. NAVSTA Mayport also provides logistical support for operating forces, dependent activities, and other commands as assigned. The installation covers approximately 13.8 square kilometers (km^2) and supports more than 60 commands, detachments, and private organizations; it is homeport to 16 surface ships and routinely hosts port visits by various deep draft ships, including nuclear-powered aircraft carriers.

NAVSTA Mayport ship berthing facilities are provided along the turning basin perimeter and a small boat basin provides a docking for tug boats and smaller craft (Figure 1-2). The Mayport Turning Basin is approximately 610 by 915 meters (m) or 0.74 km^2 in size, and is connected to the St. Johns River by a 152-meter-wide entrance channel. A Port Security Barrier has been installed at the mouth of the turning basin, protecting the entrance of the restricted area where all persons, vessels, and craft except those vessels operated by the Navy, visiting foreign navies, and the United States (U.S.) Coast Guard are prohibited, except in cases of emergency.

1.2 Bottlenose Dolphin

Bottlenose dolphins are marine mammals averaging 2 to 3.8 m in length with coloration ranging from light-gray to black with lighter coloration on the ventral side. They are one of the most commonly sighted marine mammals and can occur in inshore and offshore waters. Bottlenose dolphins are relatively long-lived, with a lifespan of 40 to 45 years for males and more than 50 years for females. They are often found in groups of 2 to 15 individuals (National Oceanic and Atmospheric Administration [NOAA] 2013).

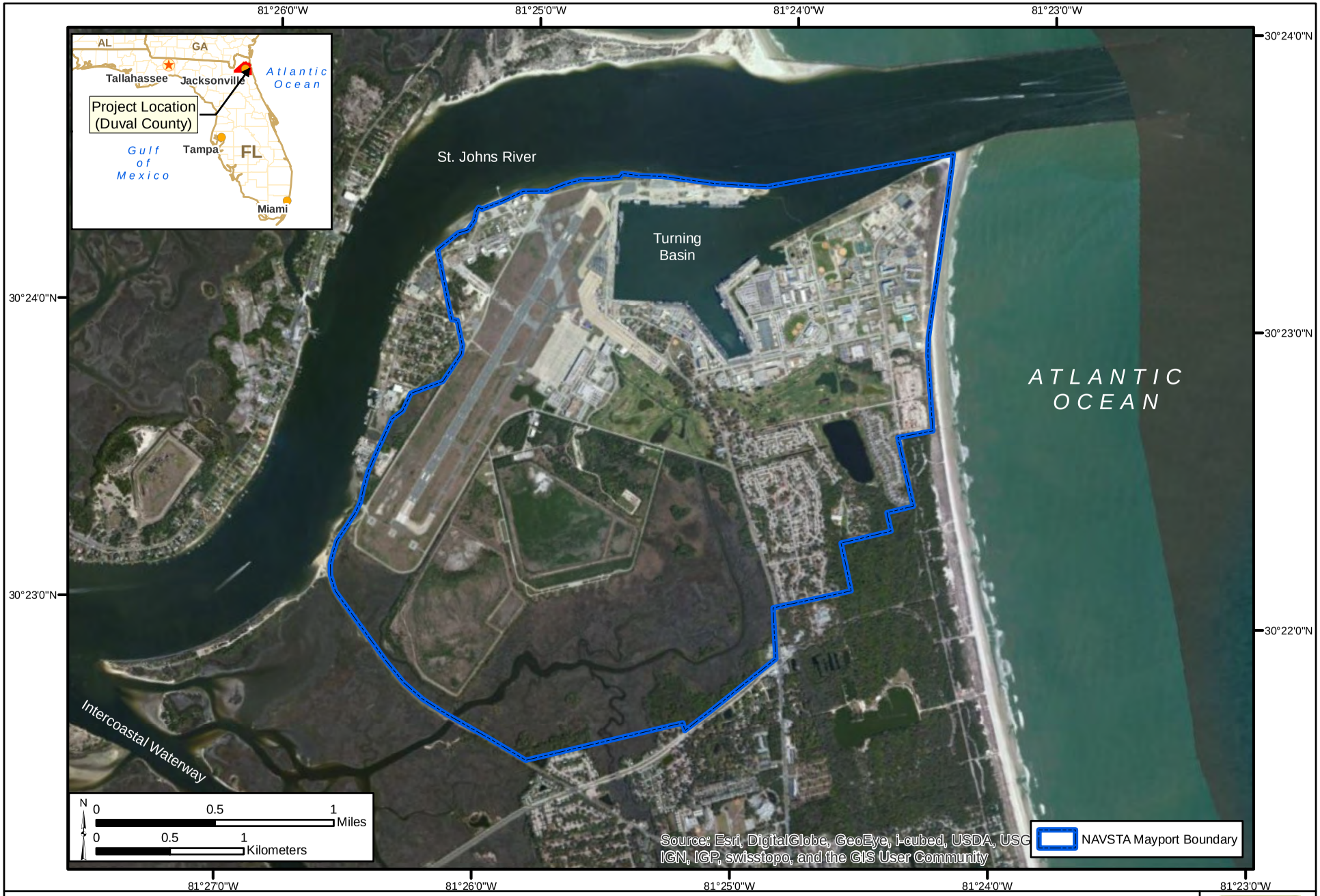

Figure 1-1. NAVSTA Mayport Site and Location Map

GSRC

May 2014

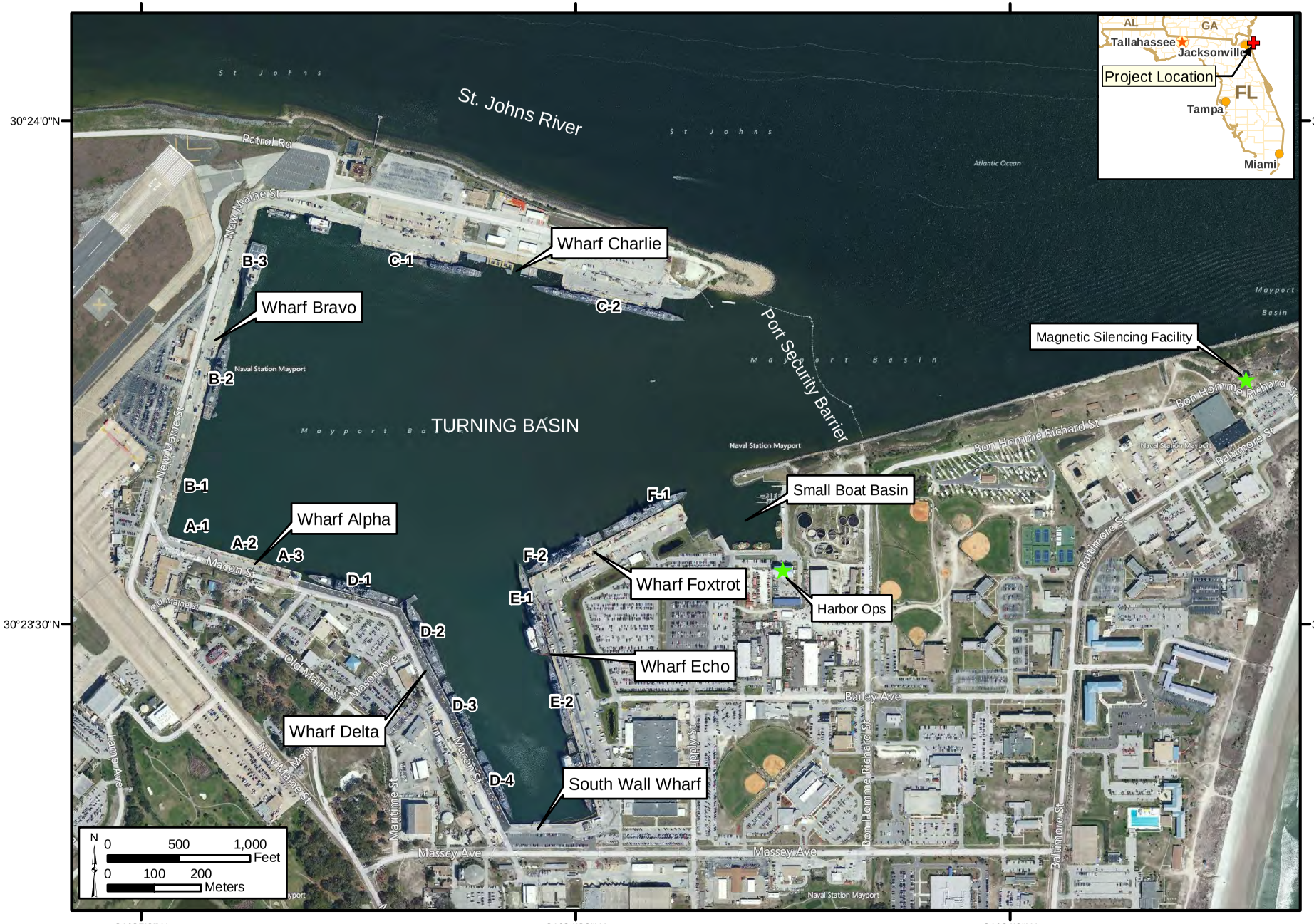

Figure 1-2. NAVSTA Mayport Turning Basin

May 2014

Bottlenose dolphins occur in temperate and tropical waters around the world and tend to form either coastal populations, which inhabit bays, estuaries, and river mouths, or offshore populations that inhabit the pelagic zone along continental shelves. Bottlenose dolphins inhabiting coastal areas typically feed on benthic invertebrates and fish, while offshore animals feed on pelagic squid and fish (NOAA 2013). High-frequency echolocation is used by bottlenose dolphin to detect prey and objects in their environment. Threats to bottlenose dolphin include accidental injury and death from fishing gear, exposure to pollutants, biotoxins, and viral outbreaks, and direct harvest in Japan and Taiwan (NOAA 2013).

Bottlenose dolphins living along the coast nearshore have been shown to be distinct from populations inhabiting bays, sounds, and estuaries (Caldwell 2001, Gubbins 2002, Zolman 2002, Gubbins et al. 2003, Mazzoil et al. 2005). The Jacksonville Estuarine System (JES) bottlenose dolphin stock is bounded to the north by Cumberland Sound and extends south to Jacksonville Beach. Habitat in the JES comprises several brackish rivers, with the St. Johns River being the largest. The St. Johns River near the coast is a deep and fast-moving river with heavy boat activity. The rest of the habitat in the JES is composed of tidal marsh and shallower riverine systems and the Intracoastal Waterway (NOAA 2009).

The JES stock was defined as a separate estuarine stock based on the results of photo-identification and genetic studies (NOAA 2009). Caldwell (2001) found that within the JES system bottlenose dolphins formed two distinct communities on either side of the St. Johns River and showed some fidelity to either the northern or southern region. They also found some dolphins in the JES coastal area that they concluded were part of the coastal morphotype stock that ranges more broadly and beyond the limits of the JES (NOAA 2009).

JES stock demonstrated oscillating abundance year-round with low numbers in December and January and peak numbers that correlated with higher water temperatures (Gubbins et al. 2003). Data collected by Caldwell (2001) that was incorporated into a larger study (Gubbins et al. 2003) estimated the size of the JES bottlenose dolphin stock to be 412 residents (Coefficient of Variance [CV]= 0.06); however, the authors note that this is likely an overestimate because it includes non-resident and seasonally resident dolphins (NOAA 2009). Caldwell (2001) reported that 122 individuals were resighted at least 10 times in the JES during their study. Total population size is uncertain and population trends for the JES stock are unknown (NOAA 2009).

It is recognized, however, that in addition to the JES stock, bottlenose dolphins occurring in the NAVSTA Mayport Turning Basin may also be individuals belonging to any of the following additional stocks: the Western North Atlantic Offshore Stock, the Western North Atlantic Northern Florida Coastal Stock, and the Western North Atlantic Southern Migratory Coastal Stock (Waring et al. 2013).

SECTION 2.0
METHODOLOGY

2.0 METHODOLOGY

Four quarterly, seasonal shore-based dolphin surveys were performed in the NAVSTA Mayport Turning Basin between December 2012 and September 2013. The surveys were conducted visually using season-trained Protected Species Observers (PSO).

2.1 Survey Area

The survey area (0.74 km^2) included the entire NAVSTA Mayport Turning Basin and the small boat basin, as well as part of the entrance channel just outside the Port Security Barrier. The survey area was initially divided into 11, sequentially numbered survey grids (#1 through #11) of varying sizes, from which Harbor Ops staff volunteered to collect preliminary observation data prior to the start of this study. During the actual design of this study, however, the importance of the harbor area just beyond the in-water security fence and east of Grid #4 was recognized, and therefore an additional survey grid (#4a) was added (Figure 2-1).

2.2 Survey Timing

The NAVSTA Mayport dolphin surveys comprised four quarterly, seasonal surveys that were conducted on the following dates:

- 1st Quarter Survey; December 10 through 13, 2012 (Winter)
- 2nd Quarter Survey; March 4 through 7, 2013 (Spring)
- 3rd Quarter Survey; June 3 through 6, 2013 (Summer)
- 4th Quarter Survey; September 9 through 12, 2013 (Fall)

Daily surveys were divided into two survey periods: survey period one (morning) and survey period two (afternoon). Survey period one was initiated at or just after sunrise and survey period two was conducted to conclude at or near sunset. Where each daily survey typically included two survey periods, on some occasions the seasonal survey began with survey period two, and concluded with survey period one. This occurred when the PSOs traveled and arrived during the morning of a daily survey period one, and thus initiated the season survey on survey period two. Visual surveys were conducted synchronously by each of the two PSOs for a 5-minute observation duration, every 30 minutes for a duration of at least 4 hours in survey period one, and for a duration of 4 hours in survey period two. This level of effort resulted in each PSO conducting between 8 and 11 synchronous, 5-minute data collections during each of the period one and period two surveys. The PSOs used cell phone communication (texting) to coordinate the precise timing (start and stop) and consistent number of observations conducted during each survey period.

2.3 PSO Observation Points

Two PSOs occupied one of two different observation points during each daily survey period. The primary observation point was established on the fourth story of the Harbor Operations (OPS) building (Figure 2-1). The large viewing area windows and the elevated vantage point offered the PSOs a commanding view of much of the turning basin as well as the entrance channel. The secondary observation point was typically located near pier B1, but the PSO could migrate their location between B-2 and C-1 to improve their vantage point. The exact position of the secondary observation point varied among survey periods based on the docking position of ships in the turning basin or harbor maintenance activity that may have potentially

Figure 2-1. NAVSTA Mayport Harbor Turning Basin

May 2014

obstructed their view. The PSO selected the secondary observation point that provided the best line-of-sight and the greatest survey viewing area between piers B-2 and C-1. During many surveys, the variable secondary observation point compensated for blocked viewing areas experienced by the PSO positioned in the primary observation point.

2.4 Data Collection

The PSOs scanned (with and without 7x 50 mm binoculars) the entire visible survey area for dolphins and other marine species during each of the survey periods. The observation data were recorded by each of the PSOs on pre-constructed field datasheets (Figure 2-2) for each of the daily survey periods. Each PSO collected data independently, but synchronously and noted the total number of dolphins or other marine species sighted in each of the grids during each 5-minute observation period. A "0" (zero) was entered on the datasheet for those grids where no sightings were observed. An "X" was entered on the datasheets for those grids with an obstructed (ship locations or line-of-sight angle from the PSO) field of view, thus indicating that no observations could be made by the PSOs. A "–" (dash) was entered on the datasheets for those grids during time periods when inclement weather (stormy, rainy or foggy conditions) or poor light conditions (glare, sunrise, or sunset) obscured the field of view, thus indicating that no observations could be made by the PSOs. The PSOs additionally documented information on animal behavior (jumping, swimming in pairs, group sizes, etc.) and for survey interruptions or impairments (such as heavy rain or fog).

Beaufort Sea State data were also recorded during each of the 5-minute observation periods. Tidal and sunrise/sunset data were also obtained and recorded typically before the seasonal surveys were conducted. Data from the hand-recorded data sheets were transcribed to digital Excel files at the conclusion of each seasonal survey. The hand-recorded and digital datasheets were proofed and reconciled between two staff members. Copies of the original hand-recorded datasheets are provided in Appendix A, along with copies of the digital replications of the datasheets in Appendix B.

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date:
Observation Point:
Survey Period:

Marine Species Observer:
Printed Name:

Signature:

Visual Suvey	Start Time	End Time	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data	
(#)	(24 hrs)	(24 hrs)	1	2	3	4	4a	5	6	7	8	9	10	11		(Ft)	(H/L)
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

NS Mayport Dolphin Density & Take Estimates 2012 -2013 QrtSurveys_V7.xlsm (DON 2014b)
Source: GSRC 2014

Figure 2-2. Survey Period Datasheets

SECTION 3.0
RESULTS

3.0 RESULTS

3.1 Dolphin Data: Observations and Density Estimations

The survey observation data have been summarized using three analysis approaches (methods), providing the user of this report data with an opportunity to utilize the data under alternative future scenarios. These data are captured in a single Excel spreadsheet file:

NS Mayport Dolphin Density & Take Estimates 2012 -2013 QrtSurveys_V7.xlsm (DON 2014b)

Method #1 reports the observation data collected only by the Primary PSO (PPSO), who was located in the Harbor Ops building. Method #2 reports data collected only by the secondary PSO (SPSO), who was located along the western edge of the turning basin between Piers B-2 and C-1. Method #3 reports data from the PPSO, that is supplemented with data from the SPSO for only those survey grids that were not visible (e.g., X in the datasheet grid) to PPSO. The datasheet cells for Method #3, which have been supplemented by observation data from the SPSO, are highlighted in grey column headers for easier recognition. Yellow highlighted cells simply identify when sighting observations occurred for easier datasheet recognition. Data values below each of the individual survey period tables present intermediate data summations leading to the summary statistic calculations described in the bulleted descriptions to follow, as illustrated in Figure 3-1.

Visual Suvey	Start Time	End Time	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])											
(#)	(24 hrs)	(24 hrs)	1	2	3	4	4a	5	6	7	8	9	10	11
1	0700	0705	-	-	-	-	-	-	-	-	-	-	-	-
2	0730	0735	X	0	0	0	0	4	0	0	0	0	0	0
3	0800	0805	-	-	-	-	-	-	-	-	-	-	-	-
4	0830	0835	X	X	0	0	0	0	0	0	0	0	0	0
5	0900	09005	X	X	0	4	0	-	-	-	0	-	0	-
6	0930	0935	X	X	0	1	0	0	0	0	1	0	0	0
7	1000	1005	X	0	0	0	0	0	0	0	0	0	0	0
8	1030	1035	X	0	0	3	1	0	0	0	0	0	0	0
9	1100	1105	X	0	0	0	0	0	0	0	0	0	0	0
10	1130	1135	X	0	0	0	0	0	0	0	0	0	0	0
				0	0	8	1	4	0	0	1	0	0	0

Figure 3-1. Example Data Capture from the Worksheet "1stQrtSurvey-PPSO w SPSO Fill"

The first tab or worksheet in the file is titled "**SUMMARY**" and, as it implies, provides the user with a summarization of the observation and density calculations for all three methodologies. Navigation is facilitated by the hyperlinks leaving and returning to this "**SUMMARY**" tab. For each of the quarterly seasonal surveys, the following data summary statistics are provided:

- **Total Dolphins Observed:** Equates to the total number of individual dolphins observed across the six survey periods conducted for each of the quarterly seasonal surveys by either the PPSO or SPSO. This statistic was calculated for each of the four quarterly seasonal surveys (Example = ***cell S4***).

- **Total Observations with Sightings:** Equates to the total number of observation events (each 5-minute survey observation) where one or more dolphins were sighted. This statistic is always equal to or less (usually less) than the "Total Dolphins Observed" by either the PPSO or SPSO. This statistic was calculated for each of the four quarterly seasonal surveys (Example = cell S5).
- **1stQrtSurvey PPSO (or SPSO) Average:** Equates to the statistic describing the cumulative average or mean number of dolphins observed per sighting by the PPSO (or SPSO) during the first quarterly seasonal survey. The calculation is made by dividing the "Total Dolphins Observed" statistic by the "Total Observations with Sightings" statistic. This statistic was calculated for each of the remaining quarterly seasonal surveys and for each of the PSOs; 2ndQrtSurvey PPSO [or SPSO] Average, 3rdQrtSurvey PPSO [or SPSO] Average, and 4thQrtSurvey PPSO [or SPSO] Average (Example = cell S6).
- **Median Number of Dolphins Observed:** Equates to the statistic describing center or midpoint data value of the "Total Dolphins Observed" by the PPSO or SPSO. This statistic was calculated for each of the four seasonal surveys (Example = ***cell S7***).
- **Turning Basin Survey Area (km^2):** Equates to the statistic describing the total sum area in square kilometers of all 12 grids within the NAVSTA Mayport Turning Basin potentially surveyed during each of the quarterly seasonal surveys (Example = ***cell S8***). Since multiple grids within the turning basin are surveyed several times (8 to 11) during each survey period, this statistic is the sum of the area of all grids surveyed, every time they are surveyed.
- **Average Dolphin Density (#/km^2):** Equates to the statistic describing the cumulative average or mean number of dolphins per square kilometer within the NAVSTA Mayport Turning Basin. The calculation is made by dividing "1stQrtSurvey PPSO (or SPSO) Average" statistic by the "Turning Basin Survey Area" statistic. Calculations of the "Average Dolphin Density" statistics for all other quarterly seasonal surveys are performed similarly (Example = ***cell S9***).
- **Median Dolphin Density (#/km^2):** Equates to the statistic describing the number of dolphins per square kilometer within the NAVSTA Mayport Turning Basin represented by the center or midpoint data value of the "Total Dolphins Observed" by the PPSO or SPSO. The calculation is made by dividing "Median Number of Dolphins Observed" statistic by the "Turning Basin Survey Area" statistic. Calculations of the "Median Dolphin Density" statistics for all other quarterly seasonal surveys are performed similarly (Example = ***cell S10***).
- **Correction Factor for Missed Observations (%):** Equates to the statistic or correction factor, represented as a percentage, which accounts for PSO error describing the number of sightings the PSO potentially missed. The correction factor is determined for only those grids where the two PSOs conducted synchronous yet independent surveys. This correction factor provides the proportion of detections or sightings potentially missed by a PSO; the correction factor is based on that PSO who experienced the most sightings and is established from the Lincoln-Petersen 2 sample mark recapture application (Lincoln 1930 and Petersen 1896). The calculation is made by subtracting the "Total Observations with Sightings" statistic of the PPSO from the SPSO, and dividing this sub value by the "Total Observations with Sightings" statistic of the PPSO; represented as a percentage (Author recommendation: Andrew DiMatteo [NAVFAC Atlantic]; via email 11/05/13 [DON 2013c]). This statistic was only calculated for the observation data from Method #3 (Example = ***cell S29***).

- **Adjusted Final Density (#/km^2):** Equates to the statistic describing the cumulative average or mean number of dolphins per square kilometer within the NS Mayport turning basin, which has been adjusted (as an increase) for the number of sightings the PSO potentially missed. The calculation is made by multiplying the "Average Dolphin Density" statistic by the "Correction Factor for Missed Observations" statistic, and adding this sub-value to the "Average Dolphin Density" statistic. This statistic was only calculated for the observation data from Method #3 (Example = ***cell S30***).
- **Perception Bias Correction Factor Calculation (%):** Equates to a statistic that corrects for the potential variation in sightings between the PPSO and SPSO resulting from grids where it was thought that PSOs would have an unequal opportunity to detect dolphins, based on distance or obstructions. As such, sighting data from grids 1, 8, and 4a were excluded from the perception bias correction factor calculation. (Author recommendation: Doug Nemeth [NAVFAC Southeast]; via email 12/13/13 [DON 2013d]). This statistic was only calculated for the observation data from Method #3 (Example = ***cell S31***).
- **Perception Bias Adjusted Final Density (#/km^2):** Equates to the statistic describing the cumulative average or mean number of dolphins per square kilometer within the NAVSTA Mayport Turning Basin, which has been alternatively adjusted (as an increase) for the number of sightings the PSO potentially missed. The calculation is made by multiplying the "Average Dolphin Density" statistic by the "Perception Bias Correction Factor Calculation" statistic (with the elimination of data from grids 1, 8, and 4a), and adding this sub value to the "Average Dolphin Density" statistic. This statistic was only calculated for the observation data from Method #3 (Example = ***cell S32***).

The analytical approach represented by Method #3 was deemed to provide the most reasonable statistics describing the number of dolphin observations, sightings, and adjusted density estimates resulting from the four quarterly seasonal surveys conducted by the PSOs. For planning purposes, the adjusted density estimates of Method #3 have been selected to further evaluate potential *take* estimates associated with the recapitalization, replacement, repair, and maintenance of pier infrastructure within the NAVSTA Mayport Turning Basin. Future planning exercises may benefit, however, from the data provided from Method #1 and Method #2 as well.

The authors realize that a single year-long survey effort, represented by four quarterly surveys, contains inherent limitations when understanding the seasonal occurrence, distribution, and abundance of dolphins. The adjusted density estimates of the four quarterly seasonal (2012 winter, 2013 spring, 2013 summer, and 2013 fall) surveys do provide, however, the best available science for estimating potential impacts on bottlenose dolphins associated with the future recapitalization, replacement, repair, and maintenance of infrastructure associated with the fenced-in area of the NAVSTA Mayport Turning Basin.

Table 3-1 summarizes the observation and density estimate statistics for each of the quarterly seasonal surveys conducted by both the PPSO and SPSO for all three analysis approaches.

Table 3-1. Dolphin Survey Data: Observations and Density Statistics

Analysis Approach	1stQrtSurvey (12/10-12/13)	2ndQrtSurvey (03/04-07/14)	3rdQrtSurvey (06/03-06/14)	4thQrtSurvey (09/09-12/14)
Method #1 Statistics				
Total Dolphins Observed (#):	54	35	77	50
Total Observations with Sightings (#):	29	25	19	12
Survey PPSO Average (#):	1.862	1.400	4.053	4.167
Median Number of Dolphins Observed (#):	1	1	3	3
Turning Basin Survey Area (km^2):	23.321	26.287	18.668	15.381
Average Dolphin Density (#/km^2):	2.315	1.331	4.125	3.251
Median Dolphin Density (#/km^2):	0.043	0.038	0.161	0.195
Method #2 Statistics				
Total Dolphins Observed (#):	54	37	18	6
Total Observations with Sightings (#):	31	17	4	5
Survey SPSO Average (#):	1.742	2.176	4.500	1.200
Median Number of Dolphins Observed (#):	2	2	4	1
Turning Basin Survey Area (km^2):	34.172	30.130	39.593	39.005
Average Dolphin Density (#/km^2):	1.580	1.228	0.455	0.154
Median Dolphin Density (#/km^2):	0.059	0.066	0.101	0.026
Method #3 Statistics				
Total Dolphins Observed (#):	69	52	84	50
Total Observations with Sightings (#):	37	32	32	12
Survey PPSO (Supplemented) Average (#):	1.865	1.625	2.625	4.167
Median Number of Dolphins Observed (#):	1	1	3.5	3
Turning Basin Survey Area (km^2):	39.086	33.133	40.446	36.968
Average Dolphin Density (#/km^2):	1.765	1.569	2.077	1.353
Median Dolphin Density (#/km^2):	0.026	0.030	0.087	0.081
Correction Factor for Missed Observations (%):	12.50%	60.00%	84.21%	58.33%
Adjusted Final Density (#/km^2):	1.986	2.511	3.826	2.141
Perception Bias Correction Factor (%):	12.50%	52.63%	100.00%	50.00%
Perception Bias Adjusted Final Density (#/km^2):	1.98603	2.39544	4.15366	2.02876

NS Mayport Dolphin Density & Take Estimates 2012 -2013 QrtSurveys_V7.xlsm (DON 2014b)
Source: GSRC 2014.

SECTION 4.0
DISCUSSION

4.0 DISCUSSION

4.1 Dolphin Survey

Bottlenose dolphins were sighted in the survey area during each season, and a Florida manatee (*Trichechus manatus latirostris*) was sighted in the NAVSTA Mayport Turning Basin during the summer survey. Because large ships regularly obscured some survey grids and no one PSO could accurately survey the entire turning basin, Method #3 was selected to analyze survey data. Method #3 has the advantage of incorporating data from the widest range of viewable survey grids. For survey grids that both observers were able to see, the data collected by the PPSO was used. The PPSO generally had a superior view of the area due to their elevated position on the fourth floor of the Harbor OPS building and location nearer the entrance channel.

The greatest number of dolphins was observed in observation Grid 4a, which is at the entrance channel where the turning basin connects with the St. Johns River. Observation Grid 4a provides minimal confinement of dolphins relative to the other grids in the survey area, which are within the actual turning basin. Observation Grid 4a also sits at the closest proximity to dolphin habitat outside the survey area, and any dolphin entering the survey area must pass through observation Grid 4a. Another potential reason for increased abundance in observations within Grid 4a is the frequent occurrence of rips created by river currents as they pass by the relatively still waters of the entrance channel. Rips are known to be common foraging areas for predatory marine species.

The total observations of marine mammals were highest in summer (84 total dolphins), followed by winter (69 total dolphins), spring (52 total dolphins), and fall (50 total dolphins). Sightings were most frequent in winter, when dolphins were detected during 37 of the total observation periods. However, during winter the median number of dolphins observed during each survey period was 1 individual, while in summer and fall the median numbers of dolphins observed were 3.5 and 3.0 individuals per survey period, respectively. After correcting for missed observations and perception bias, the greatest adjusted density of dolphins occurred in summer, followed by spring, fall, and winter. This pattern of increased abundance during summer, when water temperatures are warmer, generally agrees with the findings of Gubbins et al. (2003).

4.2 Dolphin *Take* Estimates

The *Programmatic Biological Assessment for Harbor Maintenance and Repairs within the Mayport Turning Basin, NAVSTA Mayport* (DON 2014a) uses the recapitalization of Wharf Charlie 2 Pier (C-2) as a basis for estimating the scope of future pier construction activities. For further details of this document, reference the *Environmental Assessment for Wharf C-2 Recapitalization, NAVSTA Mayport, Florida* (DON 2013a). As such, similar recapitalization projects are anticipated for piers associated with the Bravo (B), Echo (E), Foxtrot (F), and South Wall (SW) wharfs of the NAVSTA Mayport Turning Basin. Descriptions of these activities are not provided in this report but are available within the analyses of the Mayport PBA.

The following *take* estimation discussions are provided using three analytical approaches, which allows the user of this report data an opportunity to utilize the data under alternative future scenarios. These data are captured in a single Excel spreadsheet file:

NS Mayport Dolphin Density & Take Estimates 2012 -2013 QrtSurveys_V7.xlsm (DON 2014b)

Again, the first tab or worksheet in the file is titled **"SUMMARY"**. It not only provides the user with a summarization of the observation and density calculations for all three methodologies, but hyperlinks to tabs or worksheets containing the "**Survey Methodology"**, "**Survey Datasheet"**, "**Basin Grid Map"**, "**Grid Areas"**, and "**MM *Take* Estimates"**. Navigation is facilitated by the hyperlinks leaving and returning to this **"SUMMARY"** tab. The **"MM Take Estimates"** tab or worksheet, and the subsequent calculations are based on the following four sets of assumptions:

The first set of assumptions utilizes estimates of the pile driving noise attenuation distances and areas calculated for the injury and behavioral noise thresholds for the various pile construction materials (steel and polymeric) and installation methods (vibratory and impact). Noise attenuation distances were not acoustically modeled for this effort; instead the values were borrowed from the *IHA for Wharf C-2 Recapitalization, NAVSTA Mayport, Florida* (DON 2013b) and used as representative surrogate values. The subsequent zones of influence, or exposure areas, were then graphically projected, based on the Bravo, Echo, Foxtrot, and South Wall wharf locations, radial distance, and potential sound propagation angle from these wharf locations. Table 4-1, modified from the *Programmatic Biological Assessment for Harbor Maintenance and Repairs within the Mayport Turning Basin, NAVSTA Mayport* (DON 2014a), summarizes these data, which are in turn utilized in the *take* calculation worksheet of the above-referenced spreadsheet. As future projects are identified, updated pile driving noise attenuation distances and areas should be determined (remodeled) for the injury and behavioral noise thresholds for the various pile construction materials (steel and polymeric) and installation methods (vibratory and impact) and updated on the **"MM Take Estimates"** worksheet; columns E, F, M, N, Q, R, Y, and Z.

A second set of assumptions is based on the scope of work and duration of work to be conducted during future wharf recapitalization projects. The scope and duration of work used for the *take* estimates associated with the recapitalization, replacement, repair, and maintenance of the Bravo, Echo, Foxtrot, and the South Wall wharf locations were proportionately based on the what was performed at Wharf C-2, as described on page 7 of the *IHA for Wharf C-2 Recapitalization, NAVSTA Mayport, Florida* (DON 2013b):

> "…the Project will include installation of approximately 120 single sheet piles, 119 king piles, and 50 polymeric (plastic) fender piles will then be installed. A maximum of 70 days of in-water pile driving work will take place over a 12-month period. Five days of vibratory driving of polymeric fender piles are also anticipated. For vibratory driving, the acoustic analysis used the assumption that a maximum of three templates (each consisting of five king piles and four sheet pile pairs) would be driven each day, for a maximum total length of approximately 75 ft. Polymeric fender piles to be installed later in the project will be vibratory driven individually, at a rate of approximately 10 piles per day. Of the 70 days, 50 days will be vibratory hammer driving and 20 days will be contingency impact driving. Vibratory and impact driving may be conducted on the same day if necessary. Driving rigs will not be operated simultaneously..."

The Wharf C-2 recapitalization work described above was performed on a single pier. Since the future recapitalization work for the Bravo, Echo, Foxtrot, and the South Wall wharf locations are yet to be defined, it can be estimated proportionately; however, the following similar scopes and durations of work may be anticipated for these locations:

- Wharf Bravo = 3 pier areas (B-1, B-2, and B-3) similar to C-2
- Wharf Echo = 3 pier areas (E-1, E-2, and E-3) similar to C-2
- Wharf Foxtrot = 2 pier areas (F-1 and F-2) similar to C-2
- South Wall = 1 pier area similar to C-2

Table 4-1. Approximate Distances and Areas Encompassed By the Underwater Marine Mammal Noise Thresholds During Installation of Steel and Polymeric Piles

Pile Type	Driving Method	Threshold (dB re 1 µPa rms)	Distance (m)	Area (km^2)		Distance (m)	Area (km^2)	
				Wharf Bravo	Wharf Foxtrot		Wharf Echo	South Wall
Steel Piles (sheet and king)	Vibratory	Level A (injury): 180	0.74	0.00045	0.000233	0.74	0.00037	0.000122
		Level B (behavioral): 120	7,356	2.96	2.96	1,438	0.03295	0.3295
	Impact (contingency)	Level A (injury): 180	39.8	0.02502	0.01730	39.8	0.02043	0.0067
		Level B (behavioral): 160	858	0.5868	0.8402	858	0.3295	0.3295
Polymeric Fender Piles	Vibratory	Level A (injury): 180	0.16	0.000097	0.00005	0.16	0.000073	0.00026
		Level B (behavioral): 120	1,585	0.8439	0.9746	1,438	0.3295	0.3295
	Impact (contingency)	Level A (injury): 180	10	0.00618	0.00342	10	0.00469	0.00166
		Level B (behavioral): 160	46.4	0.02919	0.02116	46.4	0.02427	0.00786

Source: DON 2014 and GSRC 2014
dB re 1 µPa rms = decibels referenced at 1 microPascal root mean square

A third set of assumptions addresses the number of pier area location projects similar to C-2 that may be executed at any given time. Due to the importance of the ship docking facilities within the NAVSTA Mayport turning basin, however, it would be highly unlikely that more than a single recapitalization project similar in size and scope to C-2 would be executed at any given time. The above-referenced spreadsheet does provide calculations of *take* that have been estimated for each of these notional pier areas for each of the Bravo, Echo, Foxtrot, and South Wall wharf locations, for a total of nine possible pier area locations.

A fourth set of assumptions addresses the marine species densities for other probable protected MMPA species potentially exposed to noise from the future proposed pier recapitalization activities. Density estimates for the following marine mammal species have been referenced from the *IHA for Wharf C-2 Recapitalization, NAVSTA Mayport, Florida* (DON 2013b) document: North Atlantic right whale (*Eubalaena glacialis*), 0.00005 animal/km^2; humpback whale (*Megaptera novaeangliae*) 0.000113 animals/km^2; and the Atlantic spotted dolphin (*Stenella frontalis*), 0.680256 animal/km^2. The original source data were taken from "*Navy OPAREA Density Estimates (NODE) for the Southeast OPAREAS: VACAPES, CHPT, JAX/CHASN, and Southeastern Florida & AUTEC-Andros*" (DON 2007). Density estimates for the bottlenose dolphin were developed for this report utilizing the observation data collected during the 2012 winter (1.98603 animals/km^2), 2013 spring (2.39544 animals/km^2), 2013 summer (4.15366 animals/km^2), and 2013 fall (2.02876 animals/km^2) survey seasons.

Based on the above assumptions, *take* estimates have been calculated for each species, for each of the Level A (injury) and Level B (behavioral) marine mammal acoustic thresholds associated with the different construction materials (steel and polymeric) and installation methods (vibratory and impact) across each of the Bravo, Echo, Foxtrot, and South Wall wharf locations. Further, based on the *IHA for Wharf C-2 Recapitalization, NAVSTA Mayport, Florida* (DON 2013b), *take* is established (enumerated) for daily events and for each of the different installation methods (vibratory and impact) employed. As such, each daily event is considered a separate event, where *takes* are calculated as the number of animal exposures to the potential noise threshold level. The value is rounded down to the whole number if the fractional component of the value is less than 0.5, and the value is rounded up to the next whole number if the fractional component of the value is greater than 0.5. This resultant *take* value is then multiplied by the number of daily events for each particular pile driving method. Snapshots of the *take* estimations are provided in Appendix C.

Three example calculations are as follows, using the Excel spreadsheet file:

NS Mayport Dolphin Density & Take Estimates 2012 -2013 QrtSurveys_V7.xlsm (DON 2014b)

And using the last tab (worksheet) titled:

MM Take Estimates

Where; **Animal Density (#/km^2) x Threshold Exposure Area (km^2) x Days (#) = *Takes* (#)**

Example #1 (Wharf Bravo; Pier B-1):

Bottlenose Dolphin (#/km^2) (2012 Winter Density Estimate)	x	Level B Injury Exposure Area (km^2) (Pile Driving: Vibratory Steel)	x	Days (#) = *Takes* (#) (Events)
1.986 km^2 [cell B45]	x	2.96 km^2 [cell F46]	x	45 [cell G46] = 270 *Takes* [cell H46]

Example #2 (Wharf South Wall; Pier):

Bottlenose Dolphin (#/km^2) (2013 Summer Density Estimate)	x	Level B Behavioral Exposure Area (km^2) (Pile Driving: Impact [Contingency] Steel)	x	Days (#) = *Takes* (#) (Events)
4.154 km^2 [cell B71]	x	0.3295 km^2 [cell N72]	x	45 [cell O72] = 45 *Takes* [cell P72]

Example #3 (Wharf Foxtrot; Pier F-2):

Spotted Dolphin (#/km^2) (Density)	x	Level B Behavioral Exposure Area (km^2) (Pile Driving: Impact [Contingency] Steel)	x	Days (#) = *Takes* (#) (Events)
0.680256 km^2 [cell B32]	x	0.9746 km^2 [cell Z37]	x	5 [cell AC37] = 5 *Takes* [cell AD37]

SECTION 5.0
LIST OF PREPARERS

5.0 LIST OF PREPARERS

This report was prepared for the Navy by Gulf South Research Corporation (GSRC). A list of key preparation and review personnel is included.

The Navy Technical Representatives for this document are:

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Name/Title	Project Role	Subject Area Expertise	Qualifications
Dennis Peters	Project Manager	Navy Mission Assessments, Natural Resources Management, Marine Species Surveys and Monitoring, Marine Mammal Density Estimates, Marine Mammal Take Estimates, Biological Assessments (BA), Essential Fish Habitat (EFH) Assessments, and Consultations (ESA and EFH)	32 years of experience in marine and oceanographic resources, NEPA compliance, ESA, MMPA, CZMA, and environmental studies with Navy and DOD
Todd Wilkinson	Natural Resources Specialist	Natural Resources, Threatened and Endangered Species, Marine Species Surveys and Monitoring, EFH Assessment	20 years of experience in natural resources, NEPA compliance, ESA, CZMA
Liz Ayarbe-Perez	Staff Resource	GIS and Multivariate Spatial Analyses	8 years of experience in GIS/Analyses/Graphics

SECTION 6.0
LITERATURE CITED

6.0 LITERATURE CITED

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APPENDIX A
ORIGINAL DATASHEETS

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 9 SEP
Observation Point: TOWER
Survey Period: AFTER NOON, Sept 9, 2013
Marine Species Observer:
Printed Name: ROB Myers
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	3:30	3:35	X	0	0	0	0	X	X	X	0	X	X	X			
2	4:00	4:05	X	0	0	0	2	X	X	X	0	X	X	X			
3	4:30	4:35	X	0	0	0	0	X	X	X	0	X	X	X			
4	5:00	5:05	X	0	0	0	0	X	X	X	0	X	X	X			
5	5:30	5:35	X	0	0	0	0	X	X	X	0	X	X	X			
6	600	605	X	0	0	0	0	X	X	X	0	X	X	X			
7	630	6:35	X	0	0	0	0	X	X	X	0	X	X	X			
8	700	7:05	X	0	0	0	0	X	X	X	0	X	X	X			
9	7:30	7:35	X	0	0	0	0	X	X	X	0	X	X	X			
10							7										
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

X - AREA PARTIALLY OBSCURED

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 9/9/13
Observation Point: C1/B2
Survey Period: PM
Marine Species Observer: ISW
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0		1	2.36
2	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		1	1.75
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0		1	1.30
4	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		1	0.85
5	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		1	0.69
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	0.48
7	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	0.63
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	0.69
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	1.02
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	25	—	82.8	83.8	8	11	72°	1019.5	Calm Warm, Few Boats in harbor
5	1730	1735	10	—	84.0	85.1	8.10	12	85	1019.3	
9	1930	1935	5	—	82.4	84.7	7	10	85	1019.1	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 10 SEP 2012
Observation Point: TOWER
Survey Period: MORNING
Marine Species Observer:
Printed Name: ROB MYERS
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0730	735	X	O	O	O	O	X	X	X	O	X	X	X			
2	800	805	X	O	O	O	O	X	X	X	O	X	X	X			
3	830	835	X	O	O	O	O	X	X	X	O	X	X	X	2 Seaturtles in Area 8		
4	900	9:05	X	O	O	O	O	X	X	X	O	X	X	X	" " "		
5	930	9:35	X	O	O	O	O	X	X	X	O	X	X	X	4 Seaturtles in Area 8 eating barnacles on tug		
6	1000	1005	X	O	O	3	O	X	X	X	O	X	X	X	2 Seaturtles in Area 8; Dolphin moved to 8		
7	1030	1035	X	O	O	O	O	X	X	X	O	X	X	X	4 Seaturtles in Area 8		
8	1100	1105	X	O	O	O	O	X	X	X	O	X	X	X	" " "		
9	1130	1135	X	O	O	2	O	X	X	X	O	X	X	X	3 sea turtles in Area 8		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date:
Observation Point: B2
Survey Period: (D) Am 9/10/13
Marine Species Observer:
Printed Name: TSW
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0730	0735	0	0	0	0	X	0	0	0	0	0	0	0	Glare from Sun made Seeing 4a Difficult	2	0.93
2	0800	0805	0	0	0	0	X	0	0	0	0	0	0	0		2	1.26
3	0830	0835	0	0	0	0	X	0	0	0	0	0	0	0		2	1.81
4	0900	0905	0	0	0	0	0	0	0	0	X	0	0	0	Glare	2	2.27
5	0930	0935	0	0	0	0	0	0	0	0	X	0	0	0	Glare	2	2.88
6	1000	1005	0	0	0	0	0	0	0	0	X	0	0	0		2	3.37
7	1030	1035	0	0	0	0	0	0	0	0	0	0	0	0		2	3.82
8	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		2	4.30
9	1130	1135	0	0	0	1	0	0	0	0	0	0	0	0		2	4.74
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	2	—	81.3	84.4	11	15	79	1021.0	
5	0930	0935	5	—	82.0	84.2	12	16	76	1022.5	
9	1130	1135	5	—	82.8	83.8	12	15	69	1023.3	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 10 SEP 2013
Observation Point: TOWER
Survey Period: AFTERNOON
Marine Species Observer:
Printed Name: Rob Myers
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	330	335	X	0	0	0	S	X	X	X	0	X	X	X			
2	400	405	X	0	0	0	0	X	X	X	0	X	X	X			
3	430	435	X	0	0	0	0	X	X	X	0	X	X	X			
4	500	505	X	0	0	0	0	X	X	X	0	X	X	X			
5	530	535	X	0	0	0	0	X	X	X	0	X	X	X			
6	600	605	X	0	0	0	0	X	X	X	0	X	X	X	Sea turtle in AREA 8		
7	630	635	X	0	0	0	0	X	X	X	0	X	X	X	Sea turtle in AREA 8		
8	700	705	X	0	0	0	0	X	X	X	0	X	X	X			
9	730	735	X	0	0	0	0	X	X	X	0	X	X	X	Sea turtle in AREA 8		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 9/10/13
Observation Point: TSW
Survey Period: (2) pm
Marine Species Observer:
Printed Name: BZ
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0		2	3.84
2	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		2	3.16
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0		2	2.63
4	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		2	1.93
5	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		2	1.52
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	1.20
7	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	0.90
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	0.88
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	0.84
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	5	—	83.1	83.8	15	18	71	1022.0	
5	1730	1735	15	—	83.3	84.9	12	16	76	1021.5	
9	1930	1935	10	—	82.9	85.1	12	16	75	1021.1	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 11 SEP 2013
Observation Point: TOWER
Survey Period: MORNING
Marine Species Observer:
Printed Name: R. Myers
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0730	735	X	0	0	0	0	X	X	X	0	X	X	X			
2	800	805	X	0	0	0	0	X	X	X	0	X	X	X			
3	830	835	X	0	0	0	0	X	X	X	0	X	X	X	2 Sea Turtles in AREA 8		
4	900	905	X	0	0	0	0	X	X	X	0	X	X	X	" " " "		
5	930	935	X	0	0	0	6	X	X	X	2	X	X	X			
6	1000	1005	X	0	0	0	0	X	X	X	0	X	X	X	2 DOLPHIN IN RIVER OUTSIDE SURVEY AREA 1 Turtle in Area 8		
7	1030	1035	X	0	0	5	0	X	X	X	0	X	X	X	1 Turtle in Area 8		
8	1100	1105	X	0	0	0	0	X	X	X	0	X	X	X	2 Sea turtles in Area 8		
9	1130	1135	X	0	0	0	0	X	X	X	0	X	X	X	" " " " "		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 9/11/13
Observation Point: TSW
Survey Period: (1)
Marine Species Observer:
Printed Name: BZ
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0730	0735	0	0	0	0	0	0	0	0	0	0	0	0		1	0.59
2	0800	0805	0	0	0	X	X	0	0	0	0	0	0	0	GLARE FROM SUN	1	0.24
3	0830	0835	0	0	0	X	X	0	0	X	X	0	0	0	Glare / Ship Blocking 7/8	1	1.08
4	0900	0905	0	0	0	0	X	0	0	0	X	0	0	0	GLARE	1	1.43
5	0930	0935	0	0	0	0	0	0	0	0	0	0	0	0		1	2.08
6	1000	1005	0	0	0	0	0	0	0	0	0	0	0	0		1	2.57
7	1030	1035	0	0	0	0	0	0	0	0	0	0	0	0		1	2.96
8	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		1	3.56
9	1130	1135	0	0	0	0	0	0	0	0	0	0	0	0		1	4.10
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	20	—	81.3	84.2	9	11	60	1021.8	
5	0930	0935	10	—	82.2	84.2	13	15	70	1022.3	
9	1130	1135	50	—	81.1	84.4	8	17	99	1022.7	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 11 SEP 2013
Observation Point: TOWER
Survey Period: AFTERNOON
Marine Species Observer:
Printed Name: ROB MYERS
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	330	335	X	0	0	4	0	X	X	X	0	X	X	X	corralling food?		
2	400	405	X	0	0	0	0	X	X	X	0	X	X	X			
3	430	435	X	0	0	0	0	X	X	X	0	X	X	X			
4	500	505	X	0	0	3	0	X	X	X	0	X	X	X	1 SEA TURTLE IN AREA 8		
5	530	535	X	0	0	0	0	X	X	X	0	X	X	X			
6	600	605	X	0	0	0	0	X	X	X	0	X	X	X	1 Sea turtle in Area 8		
7	630	635	X	0	0	0	0	X	X	X	0	X	X	X			
8	700	705	X	0	0	0	0	X	X	X	0	X	X	X	1 Sea turtle in Area 8		
9	730	735	X	0	0	0	0	X	X	X	0	X	X	X			
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 9/11/13
Observation Point: TSW
Survey Period: ②
Marine Species Observer:
Printed Name: BZ
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0		1	4.72
2	1600	1605	0	0	0	1	0	0	0	0	0	0	0	0	Moving toward 4a	1	4.36
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0		1	3.94
4	1700	1705	0	0	0	2	0	0	0	0	0	0	0	0	maybe 3	1	3.11
5	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		1	2.54
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	2.06
7	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	1.63
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	1.27
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	1.06
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	30	—	82.0	84.0	13	14	52	1021.0	
5	1730	1735	40	—	82.0	84.2	11	15	47	1020.1	
9	1930	1935	10	—	81.9	84.9	13	15	68	1019.9	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 12 SEP 2013
Observation Point: TOWER
Survey Period: MORNING
Marine Species Observer:
Printed Name: R. MYERS
Signature: R. M

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	730	735	X	0	0	0	0	X	X	X	0	X	X	X	4 Dolphin in Rivers Outside Survey Area		
2	800	805	X	0	0	0	0	X	X	X	0	X	X	X			
3	830	835	X	0	0	0	0	X	X	X	0	X	X	X	2 SEA TURTLES IN AREA 8		
4	900	905	X	0	0	0	3	X	X	X	0	X	X	X	1 Sea turtle in AREA 8		
5	930	935	X	0	0	0	0	X	X	X	0	X	X	X			
6	1000	1005	X	0	0	0	0	X	X	X	0	X	X	X			
7	1030	1035	X	0	0	0	3	X	X	X	0	X	X	X			
8	1100	1106	X	0	0	0	0	X	X	X	0	X	X	X	1 SEA TURTLE IN AREA 8		
9	1130	1135	X	0	0	0	0	X	X	X	0	X	X	X			
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: 9/12/13
Observation Point: B2
Survey Period:
Marine Species Observer: (1)
Printed Name:
Signature:

TSW

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0730	0735	0	0	0	0	0	0	0	0	0	0	0	0		0	0.64
2	0800	0805	0	0	0	X	X	0	0	0	0	0	0	0	GLARE ON 4/4a	0	0.49
3	0830	0835	0	0	0	X	X	0	0	0	0	0	0	0	C.G. Gallatin leaves B 3	0	0.42
4	0900	0905	0	0	0	0	0	0	0	0	X	0	0	0	Glare on 8	0	0.63
5	0930	0935	0	0	0	0	0	0	0	0	X	0	0	0		0	0.98
6	1000	1005	0	0	0	0	0	0	0	0	0	0	0	0		1	1.29
7	1030	1035	0	0	0	0	1	0	0	0	0	0	0	0	LONE Dolphin Observed	1	1.95
8	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		1	2.48
9	1130	1135	0	0	0	0	0	0	0	0	0	0	0	0		1	2.99
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	20	—	77.7	84.4	3	4	334	1018.5	
5	0930	0935	30	—	79.9	84.4	4	6	20	1019.3	RAIN South of Mayport
9	1130	1135	40		81.9	84.6	7	9	54	1019.2	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4-7, 2013)
Date: 3/4/2013
Observation Point: Harbor Ops → afternoon
Survey Period:
Marine Species Observer:
Printed Name: ANN C. HOWARD
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	T	Tide Data (Ft)	Tide Data (H/L)
1	1400	1405	X	X	(1)	(2)	X	X	X	X	X	X	X	X	1 single, 2 together	3		
2	1430	1435	X	X	X	X	X	X	X	X	X	X	X	X	Ø	Ø		
3	1500	1505	X	X	X	X	X	X	X	X	X	(1)	X	X	single	1		
4	1530	1535	X	X	X	X	X	X	X	X	X	X	X	X	Ø	Ø		
5	1600	1605	X	X	X	X	(2)	X	X	X	X	X	X	X		2		
6	1630	1635	X	X	X	X	(1)	X	X	X	X	X	X	X		1		
7	1700	1705	X	X	(1)	X	X	X	X	X	X	X	X	X		1		
8	1730	1735	X	(2)	2	2	X	X	X	X	X	X	X	X		7		
9	1800	1805	X	(6)	X	X	X	X	X	X	X	X	X	X		4		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9Spring											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: MARCH 4, 2013
Date:
Observation Point: TODD WILKINSON
Survey Period: PM
Marine Species Observer:
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1400	1405	0	0	0	0	0	0	0	0	X	0	0	X			
2	1430	1435	0	0	0	0	0	0	0	0	X	0	0	X			
3	1500	1505	0	0	0	0	0	0	1	0	X	0	0	X			
4	1530	1535	0	5	1	0	0	0	0	0	X	0	0	X			
5	1600	1605	0	0	0	0	0	0	0	0	X	0	0	X			
6	1630	1635	0	0	0	0	0	0	0	0	X	0	0	X			
7	1700	1705	0	0	0	1	0	0	0	0	X	0	0	X			
8	1730	1735	0	0	0	4	0	0	0	0	X	0	0	X			
9	1800	1805	0	0	0	0	0	6	0	0	X	0	0	X	FOLLOWED WAKE OF HUNTER AS IT LEFT		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1400	1405	0	0	56	61	8	10	S	30.15↓	
5	1600	1605	0	0	54	61	6	9	E	30.13↓	
9	1800	1805	0	0	56	60.6	5	7	SSE	30.14↑	

GREAT WHITE SHARK 'LYDIA' TAGGED OFF MAYPORT

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: ~~Winter 2012 (December 10 - 13, 2013)~~ 3/5/13
Date: ~~Monday, December 10, 2012~~
Observation Point: ~~Forth Story of the Harbor Operations Building~~ PIER
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: ~~Dennis Peters~~ WILKINSON
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)
1	715	720	0	0	0	0	0	0	0	0	X	0	0	X	
2	7:45	7:50	0	0	0	0	0	0	0	0	X	0	0	X	
3	815	820	0	0	0	0	0	0	0	0	X	0	0	X	
4	845	850	0	0	0	0	0	0	0	0	X	0	0	X	
5	915	920	0	0	0	0	0	0	0	0	X	0	0	X	
6	945	950	0	0	0	1	2	0	0	0	X	0	0	X	
7	1015	1020	0	0	0	1	0	0	0	0	X	0	0	X	
8	1045	1050	0	0	0	0	0	0	0	0	X	0	0	X	
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	07:15	07:20	5	0	49.1	60.1	2.9	4.1	WNW	30.19↑ 1023.9mbars	
5	915	920	0	0	52.2	59.9	2.9	4.1	SW	1023.6	
8	1045	1050	0	0	59.7	59.7	8	9.9	SW	1022.6	

TIDES: 2:18Am - H (4.54ft)
8:28Am L - 0.14ft
2:44pm H 4.01
8:34pm L -0.14

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4-7, 2013)
Date: 3/5/2013
Observation Point: Harbor GPS - tM
Survey Period:
Marine Species Observer: Ann Howard
Printed Name:
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	total	Tide Data (Ft)	(H/L)
1	7:15	7:20	X	X	X	X	X	X	X	X	X	X	X	X		0		
2	7:45	7:50	X	X	X	X	X	X	X	X	X	X	X	X		0		
3	8:15	8:20	X	X	X	X	(2)	X	X	X	X	X	X	X	single	2		
4	8:45	8:50	X	X	X	X	X	X	X	X	X	X	X	X		0		
5	9:15	9:20	X	X	X	X	X	X	X	X	X	X	X	X		0		
6	9:45	9:50	X	X	X	X	X	X	X	X	X	X	X	X		0		
7	10:15	10:20	X	X	X	X	X	X	X	(1)	X	(1)	X	X		2		
8	10:45	10:50	X	X	X	X	X	X	X	X	X	X	X	X		0		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9Spring											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter:
Date: 3/5/13
Observation Point:
Survey Period: 2(pm
Marine Species Observer: WICKINSON
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1430	1435	0	0	0	0	0	0	0	0	X	0	0	X			
2	1500	1505	0	0	0	0	0	0	0	0	X	0	0	X			
3	1530	1535	0	0	0	0	0	0	0	0	X	0	0	X			
4	1600	1605	0	0	0	0	0	0	0	0	X	0	0	X			
5	1630	1635	0	0	0	0	0	1	0	0	X	0	0	X	DOLPHIN MOVED INTO #9 and #10		
6	1700	1705	0	0	0	0	0	0	0	0	X	0	0	X			
7	1730	1735	0	0	0	1	0	0	0	0	X	2	0	X	-Mother/calf?		
8	1800	1805	0	0	0	0	0	0	0	0	X	0	0	X			
9	1830	1835	0	0	0	0	0	3	0	0	X	0	0	X			
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1430	1435	5	0	70.9	61.0	9.9	15.9	SW	1015.1 1018.1	
5	1630	1635	5	0	72.1	62.2	14	20	SW	1016.7	
9	1830	1835	2	0	71.4	61.7	14	21	SW		

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4-7, 2013)
Date:
Observation Point: 3/5/2013 - Harbor Ops P.m
Survey Period:
Marine Species Observer:
Printed Name: Ann Howard
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1430	1435	X	(1)	X	X	X	X	X	X	X	X	X	X	1		
2	1501	1505	X	X	X	X	X	X	X	X	X	X	X	X	0		
3	1530	1535	X	X	X	X	X	X	X	X	X	X	X	X	0		
4	1600	1605	X	X	X	X	X	X	X	X	X	X	X	X	0		
5	1630	1635	X	X	X	X	X	X	X	X	X	X	X	X	0		
6	1700	1705	X	X	X	X	X	X	X	X	X	(1)	X	X	1		
7	1730	1735	X	X	X	X	X	X	X	X	X	X	X	X	0		
8	1800	1805	X	X	X	X	X	X	X	X	X	X	X	X	0		
9	1830	1835	X	(1)	(1)	X	X	X	X	(1)	X	X	X	X	3		
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9Spring											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4-7, 2013)
Date: 3/6/2013
Observation Point: Harbor Ops - a.m.
Survey Period:
Marine Species Observer: Ann Howard
Printed Name:
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	total	Tide Data (Ft)	(H/L)
1	715	720	X	X	X	X	X	X	X	X	X	X	X	X		0		
2	7:45	750	X	X	X	X	X	X	X	X	X	X	X	X		0		
3	815	820	X	X	X	X	X	X	X	X	X	X	X	X		0		
4	845	850	X	X	X	X	X	X	X	X	X	X	X	X		0		
5	915	920	X	X	X	X	X	X	X	X	X	(1)	X	X		1		
6	945	950	X	X	X	X	X	X	X	X	X	X	X	X		0		
7	1015	1020	X	X	X	X	X	X	X	X	X	X	X	X		0		
8	1045	1050	X	X	X	X	X	X	X	X	X	X	X	X		0		
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Meterological Data

(Source: Mayport (Bar Pilots Dock), FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9Spring											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: MARCH 6, 2013
Date:
Observation Point: Pier
Survey Period: (1)
Marine Species Observer:
Printed Name:
Signature: WICKWSON

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	0715	0720	0	0	0	0	0	0	0	0	X	0	0	X			
2	0745	0750	0	0	0	0	0	0	0	0	X	0	0	X			
3	0815	0820	0	0	0	0	0	0	0	0	X	0	0	X			
4	0845	0850	0	0	0	0	0	0	0	0	X	0	0	X			
5	0915	0920	0	0	0	0	0	0	0	0	X	0	0	X	BRIT. SHIP INTO B-2		
6	0945	0950	0	0	X	X	X	0	0	0	0	0	0	0			
7	1015	1020	0	0	X	X	X	0	0	0	0	0	0	0			
8	1045	1050	0	0	X	X	X	0	0	0	0	0	0	0			
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Meterological Data

[Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218]

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	0	0	45.9	61.5	11.1	19	WNW	1017.6	
5	0915	0920	0	0	46.6	59.7	15.9	24.1	WNW	1018.5	
9											

Boat Coming in @ 10~

Tides
High - 3:34 Am (4.56 ft)
Low 9:34 Am (0.04 ft)
High 3:59 pm (4.08 ft)
Low 9:44 pm (-0.24)

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: ~~Spring 2013 (March 4-7, 2013)~~ March 6/ 2013
Date:
Observation Point: (2)
Survey Period: WILKINSON PIER
Marine Species Observer:
Printed Name:
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1430	1435	0	0	X	X	X	0	0	0	0	0	0	0			
2	1500	1505	0	0	X	X	X	0	0	0	0	0	0	0			
3	1530	1535	0	0	X	X	X	2	0	0	0	0	0	0			
4	1600	1605	0	0	X	X	X	0	0	0	0	0	0	0			
5	1630	1635	0	0	X	X	X	0	0	0	0	0	0	0			
6	1700	1705	X	0	0	0	0	0	0	0	X	X	0	X	MOVED TO B DOCK		
7	1730	1735	X	0	0	0	0	1	0	0	X	X	0	X	1 headed toward Sec 1		
8	1800	1805	X	0	0	0	0	3	0	0	X	X	0	X	ALL 3 moving toward 1/2		
9	1830	1835	X	0	0	0	0	0	0	0	X	X	0	X			
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1430	1435	0	0	53.2	60.3	21.0	27.0	WNW	1016.2	
5	1630	1635	0	0	55.9	59.9	15	22.9	309 WNW	1016.3	
9	1830	1835	0	0	52.9	61.9	20.0	26.0	300 WNW	1017.9	

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4-7, 2013)
Date:
Observation Point:
Survey Period: 3/6/2013 - PM
Marine Species Observer: Harbor Ops
Printed Name: Ann Howard
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	Tide Data (H/L)
1	1430	1435	X	X	X	X	X	X	X	X	(2)	X	X	X	2		
2	1500	1505	X	X	X	X	X	X	X	X	X	X	X	X	0		
3	1530	1535	X	X	X	X	X	X	X	X	X	X	X	X	0		
4	1600	1605	X	X	X	(1)	X	X	X	X	X	X	X	X	1		
5	1630	1635	X	X	X	X	X	X	X	X	X	X	X	X	0		
6	1706	1705	X	X	X	X	X	X	X	X	X	X	X	X	0		
7	1730	1735	X	X	X	(1)	X	X	X	X	X	X	X	X	1		
8	1800	1805	X	X	X	X	X	X	X	X	X	X	X	X	0		
9	1830	1835	X	(1)	X	(1)	X	X	X	X	X	X	X	X	2		
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9Spring											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4-7, 2013)
Date:
Observation Point: 3/7/2013 - a.m.
Survey Period: Harbor Ops
Marine Species Observer: Ann Howard
Printed Name:
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	715	720	X	X	X	X	X	X	X	X	X	X	X	X	0		
2	745	750	X	X	X	X	(1)	X	X	X	X	X	X	X	1		
3	815	820	X	X	X	X	X	X	X	X	X	X	X	X	0		
4	845	850	X	X	X	X	X	X	X	X	X	X	X	X	0		
5	915	920	X	X	X	X	X	X	X	X	X	X	X	X	0		
6	945	950	X	X	X	X	X	X	X	X	X	X	X	X	0		
7	1015	1020	X	X	X	X	X	X	X	X	X	X	X	X	0		
8	1045	1050	X	X	X	X	X	X	X	X	X	X	X	X	0		
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18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9Spring											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter:
Date: 3/7/13 PIER
Observation Point:
Survey Period: (1) AM
Marine Species Observer:
Printed Name: WICKINSON
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	0715	0720	X	2	0	0	0	0	0	0	X	0	0	X			
2	0745	0750	X	0	0	0	0	0	0	0	X	0	0	X			
3	0815	0820	X	0	0	0	0	0	0	0	X	0	0	X			
4	0845	0850	X	0	0	0	0	0	0	0	X	0	0	X			
5	0915	0920	X	0	0	0	0	0	0	0	X	0	0	X			
6	0945	0950	X	0	0	0	0	0	0	0	X	0	0	X			
7	1015	1020	X	0	0	0	0	0	0	0	X	0	0	X			
8	1045	1050	X	0	0	0	0	0	0	0	X	0	0	X			
9																	
10																	
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18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	2	0	39.2	61.7	7.0	8.0	310 NW	1024.1	
5	0915	0920	5	0	45.1	59.7	12.0	14.0	26 NNE	1025.3	
8	1045	1050	10	0	47.7	59.9	8.0	11.0	50 NE	1025.6	

TIDES
0444 - High (4.67 ft
1037 - Low -0.16
1706 High 4.28
2250 Low -0.42

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 6/3/13
Observation Point: TSW (2) C/B Pier
Survey Period:
Marine Species Observer:
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) [X = No Visual Area-of-Sight [Grid Obscured]] 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0	—	1	2.56
2	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		1	3.08
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0	TSTORM Moving in FROM SE	2	4.2
4	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		1	4.53
5	1730	1735	0	X	X	X	X	0	X	X	1	0	0	X	RAIN/LIGHTNING - DOCK FROM Vehicle - Low Vis	1	4.72
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0	RAIN Cleared	1	4.70
7	1830	1835	0	0	0	0	0	0	0	0	0	X	0	0	USS CARNEY MOVING INTO B i	1	4.66
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	4.37
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	4.13
10	2000	2005	0	0	0	0	0	0	0	0	0	0	0	0	—	0	3.71
11																	
12																	
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18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	50	0	80.2	77.7	11	14	131	1020.2	
5	1730	1735	100	.5	77.4	78.3	8.9	12.0	160	1014.0	RAIN!
9	1930	1935	80	0	74.7	78.1	8.9	14.0	360	1015.8	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 3 JUNE 2013
Observation Point: TOWER
Survey Period: 1530 - ~~1535~~ 2005 #2
Marine Species Observer:
Printed Name: Rob MYERS
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1530	1535	–	–	–	–	–	X	X	–	–	X	X	X	NO MARINE MAMMALS		
2	1600	1605	–	–	–	–	–	X	X	–	–	X	X	X	" " "		
3	1629	1634	–	–	–	–	–	X	X	–	–	X	X	X	" " " STARTED 1 MINUTE early b/c storm approaching		
4	1700	1705	–	–	–	–	–	X	X	–	–	X	X	X	NO MARINE MAMMALS		
5	1730	1735	–	–	–	–	–	X	X	–	–	X	X	X	NO MARINE MAMMALS; LOW VISIBILITY, Heavy Rain, lightning		
6	1800	1805	–	–	–	–	5	X	X	–	–	X	X	X	5 DOLPHIN IN 4A		
7	1830	1835	–	–	–	–	–	X	X	–	–	X	X	X	NO MARINE MAMMALS		
8	1900	1905	–	–	–	–	–	X	X	–	–	X	X	X	3 DOLPHIN IN RIVER OUTSIDE OF SURVEY AREA		
9	1930	1935	–	–	–	–	5	X	X	–	–	X	X	X	5 DOLPHIN IN 4a plus 3 dolphin IN RIVER (OUTSIDE SURVEY AREA)		
10	2000	2005	–	–	–	–	–	X	X	–	–	X	X	X	4 Dolphin OUTSIDE SURVEY AREA		
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12																	
13																	
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15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

☒ almost 100% obscured

☒ MOST OF GRID obscured

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date:
Observation Point: TSW BRAVO PIER
Survey Period:
Marine Species Observer: (1)
Printed Name:
Signature: 6/4/13

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0700	0705	X	X	X	X	X	X	X	X	X	X	X	X	MANATEE REPORTED IN BASIN	0	3.94
2	0730	0735	X	X	X	X	X	X	X	X	X	X	X	X	—	0	3.67
3	0800	0805	X	X	X	X	X	X	X	X	X	X	X	X		0	3.38
4	0830	0835	X	X	X	X	X	X	X	X	4	X	X	X	AT LEAST 4, MAYBE 5	0	2.9
5	0900	0905	X	X	1	X	X	X	X	X	X	X	X	X	MANATEE IN 5?	0	2.1
6	0930	0935	X	X	X	X	3	X	X	X	X	X	X	X		0	1.64
7	1000	1005	X	X	X	X	4	X	X	7	X	X	X	X	LARGE GROUP	0	1.01
8	1030	1035	X	X	X	X	X	X	X	X	X	X	X	X		0	0.46
9	1100	1105	X	—	—	—	—	—	—	—	—	—	—	—		0	0.29
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11																	
12																	
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14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	75	0	75.0	78.1	6.0	7.0	234	1016.8	
5	0900	0905	100	0	76.5	78.8	6.0	8.0	235	1017.9	
9	1100	1105	90	0	80.2	79.9	7.0	9.0	227	1017.9	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 4 JUNE 2013
Observation Point: TOWER (1)
Survey Period:

Marine Species Observer:
Printed Name: ROB MYERS
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) [X = No Visual Area-of-Sight [Grid Obscured]] 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0708	0713	–	–	–	–	–	X	X	X	–	X	X	X	MANATEE SIGHTED IN AREA 8 BY NAVY ~0630 4 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
2	0730	0735	–	–	–	–	1	X	X	X	–	X	X	X	1 DOLPHIN IN 4A		
3	0800	0805	–	–	–	–	5	X	X	X	–	X	X	X	5 DOLPHIN IN 4A; 2 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
4	0830	0835	–	–	–	–	–	X	X	X	–*	X	X	X	SHIP (~500Ft LONG) TURNED IN #3 then DOCKED @ C2 2 MINUTES BEFORE SURVEY; 10 DOLPHIN IN RIVER		
5	0900	0905	–	–	–	–	4	X	X	X	–	X	X	X	5 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
6	0930	0935	–	–	–	1	11	X	X	X	–	X	X	X	5 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
7	1000	1005	–	–	8	–	–	X	X	X	–	X	X	X	5 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
8	1030	1035	–	–	–	–	–	X	X	X	–	X	X	X	4 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
9	1100	1105	–	–	–	–	–	X	X	X	–	X	X	X			
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

* DURING SURVEY #4 TODD REPORTED DOLPHIN IN AREA 8 @ 0846 TOTS M. SAW 8 DOLPHIN SWIM FROM AREA 8 → AREA 4 → AREA 4A → RIVER

[X] ALMOST 100% OBSCURED

[x] Partially VISIBLE

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 6/4/13
Observation Point: TSW
Survey Period: (2)
Marine Species Observer:
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1600	1605	X	X	X	X	X	X	X	X	X	X	X	X		0	2.86
2	1630	1635	X	X	X	X	X	X	X	X	X	X	X	X		0	3.38
3	1700	1705	X	X	X	X	X	X	X	X	X	X	X	X		0	3.75
4	1730	1735	X	X	X	X	X	X	X	X	X	X	X	X		1	4.11
5	1800	1805	X	X	X	X	X	X	X	X	X	X	X	X		0	4.45
6	1830	1835	X	X	X	X	X	X	X	X	X	X	X	X		0	4.65
7	1900	1905	X	X	X	X	X	X	X	X	X	X	X	X		0	4.72
8	1930	1935	X	X	X	X	X	X	X	X	X	X	X	X		1	4.68
9	2000	2005	X	X	X	X	X	X	X	X	X	X	X	X		1	4.46
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1600	1605	100	Trace	72.0	80.4	3.0	4.0	233	1016.6	Few Drops of Rain after shower
5	1800	1805	75	—	79.0	77.9	3.0	5.0	165.0	1016.4	
9	2000	2005	75	—	77.7	77.7	4.0	6.0	144	1017.0	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 4 JUNE 2013
Observation Point: TOWER
Survey Period: 2
Marine Species Observer:
Printed Name: ROB MYERS
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1600	1605	–	–	–	–	–	X	X	X	–	X	X	X	1 MANATEE IN AREA 8		
2	1630	1635	–	–	–	–	–	X	X	X	–	X	X	X			
3	1700	1705	–	–	–	–	–	X	X	X	–	X	X	X			
4	1730	1735	–	–	–	–	–	X	X	X	–	X	X	X			
5	1800	1805	–	–	–	–	–	X	X	X	–	X	X	X			
6	1830	1835	–	–	–	–	–	X	X	X	–	X	X	X			
7	1900	1905	–	–	–	–	3	X	X	X	–	X	X	X	5 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
8	1930	1935	–	–	–	–	–	X	X	X	–	X	X	X	2 Dolphin in RIVER OUTSIDE SURVEY AREA		
9	2000	2005	–	–	–	–	3	X	X	X	–	X	X	X	5 Dolphin IN RIVER OUTSIDE SURVEY AREA		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

[X] Partially visible

[X] almost 100% OBSCURED

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 –7, 2013)
Date: 6/5/13
Observation Point: BW
Survey Period: (1)
Marine Species Observer:
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0700	0705	0	0	0	0	0	0	0	0	0	0	0	0	NONE SEEN	0	3.94
2	0730	0735	0	0	0	0	0	0	0	0	0	0	0	0	None Seen	0	4.06
3	0900	0905	0	0	0	0	0	0	0	0	0	0	0	0	None Seen	0	3.99
4	0830	0835	0	0	0	0	0	0	0	0	0	0	0	0	None Seen	0	3.72
5	0900	0905	0	0	0	0	0	0	0	0	0	0	0	0	Coast Guard in B2	0	3.31
6	0930	0935	0	0	0	0	0	0	0	0	0	0	0	0		0	2.76
7	1000	1005	0	0	0	0	0	0	0	0	0	0	0	0	None	0	2.12
8	1030	1035	0	0	0	0	0	0	0	0	0	0	0	0	None Seen	0	1.45
9	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		0	0.88
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100	TRACE	74.1	77.9	3.0	4.0	203	1017.8	
5	0900	0905	100	—	75.9	78.1	3.0	7.0	211	1018.3	
9	1100	1105	100	—	77.5	79.0	4.0	6.0	248	1018.6	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 5 JUNE 2013
Observation Point: TOWER
Survey Period: 1
Marine Species Observer: ROB MYERS
Printed Name:
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0700	0705	–	–	–	–	–	x	x	x	–	X	X	X	100% Cloud cover		
2	0730	0735	–	–	–	–	–	x	x	x	–	X	X	X			
3	0800	0805	–	–	–	–	1	x	x	x	–	X	X	X	1 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
4	0830	0835	–	–	–	–	1	x	x	x	–	X	X	X	2 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
5	0900	0905	–	–	–	–	10	x	x	x	–	X	X	X			
6	0930	0935	–	–	–	3	1	x	x	x	–	X	X	X			
7	1000	1005	–	–	–	–	–	x	x	x	–	X	X	X			
8	1030	1035	–	–	–	–	–	x	x	x	–	X	X	X			
9	1100	1105	–	–	–	–	1	x	x	x	–	X	X	X			
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

[x] - Partially visible

[X] - almost 100% obscured

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: TSW 6/5/13
Observation Point:
Survey Period: (2)
Marine Species Observer:
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0	NONE Seen	1	2.34
2	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0	LOTS OF LAUGHING GULLS	1	2.99
3	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		1	3.39
4	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		1	3.82
5	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	4.34
6	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	4.64
7	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	4.81
8	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	4.97
9	2000	2005	0	0	0	0	0	0	0	0	0	0	0	0		1	4.95
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1600	1605	100	—	82.0	81.3	3.0	6.0	212	1014.8	
5	1800	1805	100	—	75.7	78.1	7.0	12.0	209	1016.6	
9	2000	2005	100	—	75.9	77.5	5.0	9.0	211	1016.1	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 5 JUNE 2013
Observation Point: TOWER
Survey Period: 2
Marine Species Observer:
Printed Name: IC MYERS
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	1600	1605	–	–	–	–	–	X	X	X	–	X	X	X			
2	1630	1635	–	–	–	–	–	X	X	X	–	X	X	X			
3	1700	1705	–	–	–	–	–	X	X	X	–	X	X	X			
4	1730	1735	–	–	–	–	–	X	X	X	–	X	X	X			
5	1800	1805	–	–	–	–	5	X	X	X	–	X	X	X	2 in RIVER OUTSIDE SURVEY AREA 5 DOLPHINS		
6	1830	1835	–	–	–	–	–	X	X	X	–	X	X	X	10 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
7	1900	1905	–	–	–	–	–	X	X	X	–	X	X	X	6 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
8	1930	1935	–	–	–	–	–	X	X	X	–	X	X	X	5 DOLPHIN IN RIVER OUTSIDE SURVEY ARE		
9	1000	1005	–	–	–	–	7	X	X	X	–	X	X	X	9 DOLPHIN IN RIVER OUTSIDE SURVEY AREA		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

2 DOLPHIN IN S@ 1610 → Area 3 actively Foraging

[x] - partially visible

[X] - almost 100% obscured

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 6/6/13
Observation Point: (1)
Survey Period:
Marine Species Observer: BW
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0700	0705	0	0	0	0	0	0	0	0	0	0	0	0		1	4.1
2	0730	0735	0	0	0	X	X	0	0	0	X	0	0	0	RAINFALL LIMITS VISIBILITY	2	4.4
3	0800	0805	0	0	0	0	X	0	0	0	X	X	0	0	BANDS OF RAIN	2	4.45
4	0830	0835	0	0	0	0	X	0	0	0	0	0	0	0		2	4.55
5	0900	0905	0	0	0	0	X	0	0	0	0	0	0	0		2	4.46
6	0930	0935	0	0	0	0	X	0	0	0	0	0	0	0		2	4.11
7	1000	1005	0	0	0	0	X	0	0	0	0	0	0	0		2	3.77
8	1030	1035	0	0	0	0	X	0	0	0	0	0	0	0		2	3.11
9	1100	1105	0	0	0	0	X	0	0	0	0	0	0	0		2-3	2.47
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100	2.08	77.7	77.7	8.0	9.0	101	1012.8	TROPICAL STORM WARNING
5	0900	0905	100	0.33	78.2	78.4	10.0	16.0	88	103.5	
9	1100	1105	100	.72	75.2	77.5	8	13	127	1013.2	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: 6 JUNE 2013
Observation Point: R MYERS
Survey Period: 1
Marine Species Observer:
Printed Name: Rob Myers
Signature: [signature]

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) [X = No Visual Area-of-Sight [Grid Obscured]] 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
1	0700	0705	-	-	-	-	-	X	X	X	-	X	X	X	100% CLOUD COVER, HAZY, Trop Storm Approaching		
2	0730	0735	-	-	-	-	-	X	X	X	-	X	X	X	RAIN; Extremely LOW VISIBILITY, DARK		
3	800	0805	-	-	-	-	-	X	X	X	-	X	X	X	LIGHT RAIN; SOME white capping IN RIVER		
4	0830	0835	-	-	-	-	-	X	X	X	-	X	X	X	LIGHT RAIN		
5	0900	0905	-	-	-	-	-	X	X	X	-	X	X	X	LIGHT RAIN		
6	0930	0935	-	-	-	-	2	X	X	X	-	X	X	X	LIGHT RAIN		
7	1000	1005	-	-	-	-	-	X	X	X	-	X	X	X	4 DOLPHIN IN RIVER OUTSIDE SURVEY AREA, LIGHT RAIN		
8	1030	1035	-	-	-	-	-	X	X	X	-	X	X	X	1 DOLPHIN IN RIVER OUTSIDE SURVEY AREA; LIGHT RAIN		
9	1100	1105	-	-	-	-	-	X	X	X	-	X	X	X	RAIN, HIGH WINDS W/ STRONG GUSTS		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

Other General Notes

[x] partially obscured

[X] ≥100% obscured

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/10/12
Observation Point: 2 B/C stood on 4' high power block
Survey Period:
Marine Species Observer: Dennis Peters
Printed Name:
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1230	1235	0	0	*	0	X	0	0	0	X	0	0	0	surface birds/NO bait SEA gate open		
2	1300	1305	0	0	*	0	X	0	0	0	X	0	0	0	" " helo flying (64 kts ft)		
3	1330	1335	0	0	0	0	X	0	0	2	X	0	0	0	both along SEA wall (closed SEA gate)		
4	1400	1405	0	0	0	1	X	0	0	0	X	0	0	0	NEAR patrol boat		
5	1430	1435	0	0	0	0	X	0	0	0	X	0	0	0	opened SEA gate		
6	1500	1505	0	0	0	1	X	0	0	0	X	0	0	0	rain drizzle		
7	1530	1535	0	0	0	1	X	0	0	1	X	0	0	0	rain (68 kts/ft)		
8	1600	1605													No Survey Skipped — TS w/ lightning (SEA GATE closed)		
9	1630	1635	0	0	0	0	X	0	1	0	X	0	0	0	drizzle / sailboat pulling boom / calm H2O		
10	1700	1705	0	0	0	0	X	0	0	0	X	0	0	0	flat calm		
11	1730	1735	0	0	0	1	X	0	0	0	X	0	0	0	DARK / poor visability Sunset = 5:26		
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	Beaufort Sea State	NOTES
1	1230	1235	50									
5	1430	1435	100									
9												

* only can see a portion of #4

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/11/12
Observation Point: B/C # — Stood on 4' high power block
Survey Period: 1
Marine Species Observer: Dennis Peters
Printed Name:
Signature: D Peters

Sunrise = 7:12

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	0700	0705	—	—	—	—	—	—	—	—	—	—	—	—	Too dark ; foggy — No Survey		
2	0730	0735	0	0	0	0	X	0	0	0	X	0	0	0	some fog		
3	0800	0805	0	0	0	0	X	0	0	0	X	2	0	0	mother + calf fog lifted → towards corner		
4	0830	0835	0	0	0	0	X	2	1	0	X	2	0	0	mother/calf + adult pair + adult → corner		
5	0900	0905	0	0	0	0	X	2	0	0	X	0	0	0	mother calf circling & between ships		
6	0930	0935	0	0	0	4	X	0	0	0	X	0	0	0	leaving harbor towards SEA gate		
7	1000	1005	0	0	0	0	X	0	0	0	X	0	0	0	SEA birds / cormorants		
8	1030	1035	0	0	0	0	X	0	0	0	X	0	0	0	cormorants		
9	1100	1105	0	0	0	0	X	0	0	0	X	0	0	0	"		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700										
5											
9											

only can see a portion of #4

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/11/12
Observation Point: BC — stood on 4' high power block
Survey Period: 2
Marine Species Observer: Dennis Peters
Printed Name:
Signature: D Peters

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1300	1305	0	0	0	0	X	0	0	0	X	0	0	0	wind picked up w/ deltails wind low center harbor		
2	1330	1335	0	0	0	0	X	0	0	0	X	0	0	0	"		
3	1400	1405	0	0	0	0	X	0	0	0	X	0	0	0	wind died but still breezy SEA gate opened		
4	1430	1435	0	0	0	0	X	0	0	0	X	0	0	0	"Big Horn" left the harbor CZ=Empty		
5	1500	1505	0	0	0	1	X	0	0	0	X	0	0	0	near SEA gate and close to Harbor Ops		
6	1530	1535	0	0	0	2	X	0	0	0	X	0	0	0	in middle of entrance		
7	1600	1605	0	0	0	1	X	0	0	0	X	0	0	0			
8	1630	1635	0	0	0	0	X	0	0	0	X	0	0	0	HUGO Arrived @ B-3		
9	1700	1705	0	0	0	1	X	0	0	0	X	0	0	0			
10	1730	1735	0	0	0	2	X	0	0	0	X	0	0	0	Sunset @ 5:26		
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date:
Observation Point: C/B 12/12/12 stood on a 4' high power block
Survey Period: 1
Marine Species Observer:
Printed Name: Dennis Peters
Signature: DP/Peters
Sunrise= 7:13

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	0700	0705	—	—	—	—	X	—	—	—	X	—	—	—	too dark, light chizzle		
2	0730	0735	0	0	0	0	X	4	0	0	X	0	0	0	Mother/calf Σ, 2 Adults/pair birds circling feeding	1.0 rain	
3	0800	0805	—	—	—	—	X	—	—	—	X	—	—	—	lightning - heavy rain		
4	0830	0835	0	0	0	0	X	0	0	0	X	0	0	0	light rain		
5	0900	0905	—	—	—	—	—	—	—	—	—	—	—	—	heavy rain/white out		
6	0930	0935	0	0	0	1	X	0	0	0	X	0	0	0	light rain cormorants wind died		
7	1000	1005	0	0	0	0	X	0	0	0	X	0	0	0	light rain		
8	1030	1035	0	0	0	0	X	0	0	0	X	0	0	0	" no wind		
9	1100	1105	0	0	0	0	X	0	0	0	X	0	0	0	Rain stopped cormorants feeding		
10	1130	1135	0	0	0	0	X	0	0	0	X	0	0	0	No rain "		
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/12/12
Observation Point: C/B — stood on 4' high power block
Survey Period: 2
Marine Species Observer: Dennis Peters
Printed Name: Dennis Peters
Signature: D Peters

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1330	1335	0	0	0	0	X	0	0	0	X	0	0	0	No rain / 100% overcast / no wind light to		
2	1400	1405	0	0	0	0	X	0	0	0	X	0	0	0	" " light wind		
3	1430	1435	0	0	0	0	X	0	0	0	X	0	0	0	drizzle temp decreasing "		
4	1500	1505	0	0	0	0	X	0	0	0	X	0	0	0	no rain / much cooler		
5	1530	1535	0	0	0	3	X	0	0	0	X	0	0	0	rain/down pour just started		
6	1600	1605	0	0	0	0	X	0	0	0	X	0	0	0	rain light → heavy		
7	1630	1635	0	0	0	0	X	0	0	0	X	0	0	0	rain stopped cool		
8	1700	1705	0	0	0	0	X	0	0	0	X	0	0	0	" "		
9	1730	1735	0	0	0	0	X	0	0	0	X	0	0	0	Sunset = 5:26		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/13/12
Observation Point: C/B
Survey Period: 1
Marine Species Observer: Dennis Peters
Printed Name:
Signature: D Peters

Sunrise = 0713

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	0700	0705	—	—	—	—	X				X				Too dark / raining overcast		
2	0730	0735	0	0	0	0	X	0	0	0	X	0	0	0			
3	0800	0805	2	1	2	0	X	0	0	0	X	0	0	0	(Mother/Calf) in 1, adult pair in 3		
4	0830	0835	2	0	0	0	X	0	0	0	X	0	0	0	" 1st seen in 1, then 5 then 9		
5	0900	0905	0	0	0	0	X	2	0	0	X	0	0	0	" 1st in 5 then onto 9 breezy		
6	0930	0935	2	0	0	0	X	0	0	0	X	0	0	0	" 1st in 1, then 5 then 9 "		
7	1000	1005	0	0	0	0	X	2	0	0	X	0	0	0	" 1st in 5 then 1 "		
8	1030	1035	0	0	2	0	X	0	0	0	X	0	0	0	" 1st in 3 then 2, then 1		
9	1100	1105	0	0	0	0	X	0	0	0	X	2	0	0	" 1st in 9, then 5, then 1		
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock), FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/10/2012
Observation Point: TOWER — HARBOR OPS
Survey Period: 2

Marine Species Observer:
Printed Name: TODD S. WILKINSON
Signature: [signature]

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	1230	1235	Ø	Ø	Ø	Ø	Ø	Ø	X	X	Ø	X	X	X	3+ Seen #4a after Survey Period -		
2	1300	1305	0	0	0	0	0	0	X	X	0	X	X	X			
3	1330	1335	0	0	0	0	1	0	X	X	0	X	X	X	1 IN #4 after period - same? 408		
4	1400	1405	0	0	0	0	1	0	X	X	4	X	X	X	4-1 APPEARS TO BE YOUNG/CALF		
5	1430	1435	0	0	0	0	0	0	X	X	0	X	X	X	~~1 in #4 B-1~~		
6	1500	1505	0	0	0	0	0	0	X	X	0	X	X	X	1 in #8 @ 1515, #3 @ 1522		
7	1530	1535	0	0	0	1	0	0	X	X	2	X	X	X			
8	1600	1605	—	—	—	—	—	—	X	X	—	X	X	X	TS/RAIN - NO VISIBILITY - NO SURVEY		
9	1630	1635	0	0	0	0	0	0	X	X	1	0	0	X	MOVING INTO BASIN		
10	1700	1705	0	0	0	0	3	0	X	X	0	0	0	X			
11	1730	1735	0	0	0	2	0	0	X	X	0	0	0	X			
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

1:45 - Ship moves out of #2 - opens up view to 9 & 10

Weather moving in @ 1535 — visibility reduced

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/11/12
Observation Point: HARBOR OPS
Survey Period: 1
Marine Species Observer:
Printed Name: TODD WILKINSON
Signature: TDW

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	0730	0735	0	0	0	0	0	0	X	X	0	0	0	X	FOG LIFTING, VISIBILITY GOOD		
2	0800	0805	0	0	0	0	0	0	X	X	0	0	0	X	SKY CLEARING, FOG GONE		
3	0830	0835	0	0	0	0	0	0	X	X	0	0	0	X			
4	0900	0905	0	0	0	0	0	0	X	X	0	0	0	X	FOG Moving in		
5	0930	0935	0	0	0	0	0	0	X	X	0	0	0	X			
6	1000	1005	0	0	0	0	5	0	X	X	0	0	0	X			
7	1030	1035	0	0	0	0	0	0	X	X	0	0	0	X			
8	1100	1105	0	0	0	0	0	0	X	X	0	0	0	X			
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/11/12
Observation Point: HARBOR OPS - 4th Floor
Survey Period: 2 CPMD
Marine Species Observer:
Printed Name: TODD WILKINSON
Signature:

Visual Survey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	~~1300~~	~~1305~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~X~~	~~X~~	~~0~~	~~0~~	~~0~~	~~X~~			
2	1300	1305	0	0	0	0	0	0	X	X	0	0	0	X			
3	1330	1335	0	0	0	0	0	0	X	X	0	0	0	X			
4	1400	1405	0	0	0	0	2	0	X	X	0	0	0	X			
5	1430	1435	0	0	0	0	3	0	X	X	0	0	0	X			
6	1500	1505	0	0	0	0	1	0	X	X	0	0	0	X			
7	1530	1535	0	0	0	1	0	0	X	X	0	0	0	X			
8	1600	1605	0	0	0	2	2	0	X	X	0	0	0	X			
9	1630	1635	0	0	0	0	1	0	X	X	0	0	0	X			
10	1700	1705	0	0	0	2	0	0	X	X	0	0	0	X			
11	1730	1735	0	0	0	0	0	0	X	X	0	0	0	X			
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: ~~Monday, December 10, 2012~~ 12/12/12
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: ~~1 (Morning)~~ ~~2 (Afternoon)~~ ① Morning
Marine Species Observer:
Printed Name: ~~Dennis Peters~~ TODD WILKINSON
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)
1	0730	0735	X	0	0	0	0	X	X	X	0	X	0	X	TOO HAZY TO SEE FARTHER OF BASIN
2	0830	0835	X	0	0	0	0	X	X	X	0	X	0	X	
3	0900	0905	X	X	0	4	0	X	X	X	0	X	0	X	
4	0925	0930	X	X	0	1	0	X	X	X	1	X	0	X	
5	1000	1005	X	X	0	0	0	X	X	X	0	X	0	X	
6	10:30	1035	X	X	0	3	1	X	X	X	0	X	0	X	FEMALE + CALF in 4
7	1100	1105	X	0	0	0	0	X	X	X	0	X	0	X	
8	1130	1135	X	0	0	0	0	X	X	X	0	X	0	X	
9	1330	1335	X	0	0	0	0	X	X	X	0	X	0	X	
10	1400	1405	X	0	0	0	0	X	X	X	0	X	0	X	
11	1430	1435	X	0	0	0	0	X	X	X	0	X	0	X	
12	1500	1505	X	0	0	0	1	X	X	X	0	X	0	X	2 MORE IN ST. JOHNS RIVER
13	1530	1538	X	0	0	1	0	X	X	X	0	X	0	X	
14	1600	1605	X	0	0	0	0	X	X	X	0	X	0	X	
15	1630	1635	X	0	0	0	0	X	X	X	0	X	0	X	
16	1700	1705	X	0	0	0	0	X	X	X	0	X	0	X	
17	1730	1735	X	X	0	0	0	X	X	X	0	X	X	X	LOW LIGHT
18															

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

RAIN →

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: 12/13/12
Observation Point: HARBOR OPS
Survey Period: (1) MORNING
Marine Species Observer:
Printed Name:
Signature: TODD WILKINSON

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured]) 1	2	3	4	4a	5	6	7	8	9	10	11	Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Tide Data (Ft)	(H/L)
1	0730	0735	X	0	0	0	0	X	X	X	0	X	X	X	LOW VISIBILITY		
2	0800	0805	X	0	0	0	0	X	X	X	0	X	X	X			
3	0830	0835	0	0	0	0	0	X	X	X	0	X	X	X			
4	0900	0905	0	0	0	0	0	X	X	X	0	X	X	X			
5	0930	0935	0	0	0	1	0	X	X	X	0	X	X	X	- moving toward harbor entrance		
6	1000	1005	0	0	0	1	0	X	X	X	0	X	X	X			
7	1030	1035	0	0	0	1	0	X	X	X	0	X	X	X			
8	11:00	11:05	0	0	0	0	0	X	X	X	0	X	X	X			
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218]

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°C)	Water Temp (°C)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1											
5											
9											

APPENDIX B
DIGITAL DATASHEETS

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Monday, September 09, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	X	0	0	0	0	X	X	X	0	X	X	X		1	2.36
2	1600	1605	X	0	0	0	0	X	X	X	0	X	X	X		1	1.75
3	1630	1635	X	0	0	0	0	X	X	X	0	X	X	X		2	1.30
4	1700	1705	X	0	0	0	0	X	X	X	0	X	X	X		1	0.85
5	1730	1735	X	0	0	0	0	X	X	X	0	X	X	X		1	0.69
6	1800	1805	X	0	0	0	0	X	X	X	0	X	X	X		1	0.48
7	1830	1835	X	0	0	0	0	X	X	X	0	X	X	X		1	0.63
8	1900	1905	X	0	0	0	0	X	X	X	0	X	X	X		1	0.69
9	1930	1935	X	0	0	0	0	X	X	X	0	X	X	X		1	1.02
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	25	0.00	82.80	83.80	8.00	11.00	72.00	1019.50	Calm water, few boats in basin
5	1730	1735	10	0.00	84.00	85.10	10.00	12.00	85.00	1019.30	
9	1930	1935	5	0.00	82.40	84.70	7.00	10.00	85.00	1019.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Monday, September 09, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0		1	2.36
2	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		1	1.75
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0		2	1.30
4	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		1	0.85
5	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		1	0.69
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	0.48
7	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	0.63
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	0.69
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	1.02
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	25	0.00	82.40	83.80	8.00	11.00	72.00	1019.50	
5	1730	1735	10	0.00	84.00	85.10	10.00	12.00	85.00	1019.30	
9	1930	1935	5	0.00	82.40	84.70	7.00	10.00	85.00	1019.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Tuesday, September 10, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	730	735	X	0	0	0	0	X	X	X	0	X	X	X		2	0.93
2	0800	0805	X	0	0	0	0	X	X	X	0	X	X	X		2	1.26
3	0830	0835	X	0	0	0	0	X	X	X	0	X	X	X	2 green sea turtles in area 8	2	1.81
4	0900	0905	X	0	0	0	0	X	X	X	0	X	X	X	2 green sea turtles in area 8	2	2.27
5	0930	0935	X	0	0	0	0	X	X	X	0	X	X	X	4 sea turtles in area 8 eating barnacles on tug	2	2.85
6	1000	1005	X	0	0	3	0	X	X	X	0	X	X	X	2 sea turtles in area 8, dolphin moved to area 8.	2	3.37
7	1030	1035	X	0	8	0	0	X	X	X	0	X	X	X	4 sea turtles in area 8 eating barnacles on tug	2	3.82
8	1100	1105	X	0	0	0	0	X	X	X	0	X	X	X	4 sea turtles in area 8 eating barnacles on tug	2	4.31
9	1130	1135	X	0	0	2	0	X	X	X	0	X	X	X	3 sea turtles in area 8	2	4.74
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	730	735	2	0	81.30	84.40	11.00	15.00	79.00	1021.00	
5	0930	0935	5	0	82.00	84.20	12.00	16.00	76.00	1022.50	
9	1130	1135	5	0	82.80	83.80	12.00	15.00	69.00	1023.30	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Tuesday, September 10, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0730	0735	0	0	0	0	X	0	0	0	0	0	0	0	Glare from sun obscured view of 4A	2	0.93
2	0800	0805	0	0	0	0	X	0	0	0	0	0	0	0	Glare from sun obscured view of 4A	2	1.26
3	0830	0835	0	0	0	0	X	0	0	0	0	0	0	0	Glare from sun obscured view of 4A	2	1.81
4	0900	0905	0	0	0	0	0	0	0	0	X	0	0	0	Glare from sun obscured view of Area 8	2	2.27
5	0930	0935	0	0	0	0	0	0	0	0	X	0	0	0	Glare from sun obscured view of Area 8	2	2.85
6	1000	1005	0	0	0	0	0	0	0	0	0	0	0	0		2	3.37
7	1030	1035	0	0	0	0	0	0	0	0	0	0	0	0		2	3.82
8	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		2	4.31
9	1130	1135	0	0	0	1	0	0	0	0	0	0	0	0		2	4.74
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	2	0	81.30	84.40	11.00	15.00	79.00	1021.00	
5	0930	0935	5	0	82.00	84.20	12.00	16.00	76.00	1022.50	
8	1130	1135	5	0	82.80	83.80	12.00	15.00	69.00	1023.30	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Tuesday, September 10, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	X	0	0	0	5	X	X	X	0	X	X	X		2	3.84
2	1600	1605	X	0	0	0	0	X	X	X	0	X	X	X		2	3.16
3	1630	1635	X	0	0	0	0	X	X	X	0	X	X	X		2	2.63
4	1700	1705	X	0	0	0	0	X	X	X	0	X	X	X		2	1.93
5	1730	1735	X	0	0	0	0	X	X	X	0	X	X	X		2	1.52
6	1800	1805	X	0	0	0	0	X	X	X	0	X	X	X	Sea Turtle in Area 8	1	1.20
7	1830	1835	X	0	0	0	3	X	X	X	0	X	X	X	Sea Turtle in Area 8	1	0.90
8	1900	1905	X	0	0	0	0	X	X	X	0	X	X	X		1	0.88
9	1930	1935	X	0	0	0	3	X	X	X	0	X	X	X	Sea Turtle in Area 8	1	0.84
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	5	0.00	83.10	83.80	15.00	18.00	71.00	1022.00	
5	1730	1735	15	0.00	83.30	84.90	12.00	16.00	76.00	1021.50	
9	1930	1935	10	0.00	82.90	85.10	12.00	16.00	75.00	1021.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Tuesday, September 10, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0		2	3.84
2	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		2	3.16
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0		2	2.63
4	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		2	1.93
5	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		2	1.52
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	1.20
7	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	0.90
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	0.88
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	0.84
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	5	0.00	83.10	93.80	15.00	18.00	71.00	1022.00	
5	1730	1735	15	0.00	83.30	84.90	12.00	16.00	76.00	1021.50	
9	1930	1935	10	0.00	82.90	85.10	12.00	16.00	75.00	1021.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Wednesday, September 11, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0730	0735	X	0	0	0	0	X	X	X	0	X	X	X		1	0.59
2	0800	0805	X	0	0	0	0	X	X	X	0	X	X	X		1	0.74
3	0830	0835	X	0	0	0	0	X	X	X	0	X	X	X	2 sea turles in area 8	1	1.08
4	0900	0905	X	0	0	0	0	X	X	X	0	X	X	X	2 sea turles in area 8	1	1.43
5	0930	0935	X	0	0	0	6	X	X	X	2	X	X	X		1	2.08
6	1000	1005	X	0	0	0	0	X	X	X	0	X	X	X	2 dolphin in river outside survey area, 1 turtle in Area 8	1	2.51
7	1030	1035	X	0	0	5	0	X	X	X	0	X	X	X	1 Turtle in Area 8	1	2.96
8	1100	1105	X	0	0	0	0	X	X	X	0	X	X	X	2 sea turles in area 8	1	3.56
9	1130	1135	X	0	0	0	0	X	X	X	0	X	X	X	2 sea turles in area 8	1	4.10
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	20	trace	81.30	84.20	9.00	11.00	60.00	1021.80	
5	0930	0935	10	0	82.20	84.20	13.00	15.00	70.00	1022.30	
9	1130	1135	50	0	81.10	84.40	8.00	17.00	99.00	1022.70	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Wednesday, September 11, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0730	0735	0	0	0	0	0	0	0	0	0	0	0	0		1	0.59
2	0800	0805	0	0	0	X	X	0	0	0	0	0	0	0	Glare from sun prevented view of Areas 4 and 4a	1	0.74
3	0830	0835	0	0	0	X	X	0	0	X	X	0	0	0	Glare from sun prevented view of Areas 4, 4a, 7, and 8	1	1.08
4	0900	0905	0	0	0	0	X	0	0	0	X	0	0	0		1	1.43
5	0930	0935	0	0	0	0	0	0	0	0	0	0	0	0		1	2.08
6	1000	1005	0	0	0	0	0	0	0	0	0	0	0	0		1	2.51
7	1030	1035	0	0	0	0	0	0	0	0	0	0	0	0		1	2.96
8	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		1	3.56
9	1130	1135	0	0	0	0	0	0	0	0	0	0	0	0		1	4.10
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	20	0	81.30	84.20	9.00	11.00	60.00	1021.80	
5	0930	0935	10	0	82.20	84.20	13.00	15.00	70.00	1022.30	
9	1130	1135	50	0	81.10	84.40	8.00	17.00	99.00	1022.70	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Wednesday, June 05, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	X	0	0	4	0	X	X	X	0	X	X	X	Corraling food?	1	4.72
2	1600	1605	X	0	0	0	0	X	X	X	0	X	X	X		1	4.36
3	1630	1635	X	0	0	0	0	X	X	X	0	X	X	X		1	3.94
4	1700	1705	X	0	0	3	0	X	X	X	0	X	X	X	1 sea turtle in Area 8	1	3.11
5	1730	1735	X	0	0	0	0	X	X	X	0	X	X	X		1	2.54
6	1800	1805	X	0	0	0	0	X	X	X	0	X	X	X	1 sea turtle in Area 8	1	2.06
7	1830	1835	X	0	0	0	0	X	X	X	0	X	X	X		1	1.63
8	1900	1905	X	0	0	0	0	X	X	X	0	X	X	X	1 sea turtle in Area 8	1	1.27
9	1930	1935	X	0	0	0	0	X	X	X	0	X	X	X		1	1.06
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	30	0.00	82.00	84.00	13.00	14.00	52.00	1021.00	
5	1730	1735	40	0.00	82.00	84.20	11.00	15.00	47.00	1020.10	
9	1930	1935	10	0.00	81.90	84.90	13.00	15.00	65.00	1019.90	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Wednesday, September 11, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0		1	4.72
2	1600	1605	0	0	0	1	0	0	0	0	0	0	0	0	Dolphin swimming toward 4a and mouth of turning basin	1	4.36
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0		1	3.94
4	1700	1705	0	0	0	2	0	0	0	0	0	0	0	0	Maybe 3? Difficult to count	1	3.11
5	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		1	2.54
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	2.06
7	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	1.63
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	1.27
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	1.06
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	30	0.00	82.00	84.00	13.00	14.00	52.00	1021.00	
5	1730	1735	40	0.00	82.00	84.20	11.00	15.00	47.00	1020.10	
9	1930	1935	10	0.00	81.90	84.90	13.00	15.00	65.00	1019.90	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Thursday, September 12, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0730	0735	X	0	0	0	0	X	X	X	0	X	X	X	4 dolphin in river outside survey area	0	0.64
2	0800	0805	X	0	0	0	0	X	X	X	0	X	X	X		0	0.49
3	0830	0835	X	0	0	0	0	X	X	X	0	X	X	X	2 sea turtles in Area 8	0	0.42
4	0900	0905	X	0	0	0	3	X	X	X	0	X	X	X	1 sea turtle in Area 8	0	0.63
5	0930	0935	X	0	0	0	0	X	X	X	0	X	X	X		0	0.98
6	1000	1005	X	0	0	0	0	X	X	X	0	X	X	X		1	1.29
7	1030	1035	X	0	0	0	3	X	X	X	0	X	X	X		1	1.95
8	1100	1105	X	0	0	0	0	X	X	X	0	X	X	X	1 sea turtle in Area 8	1	2.48
9	1130	1135	X	0	0	0	0	X	X	X	0	X	X	X		1	2.99
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	20	0	77.70	84.40	3.00	4.00	334.00	1018.50	
5	0930	0935	30	0	79.90	84.40	4.00	6.00	20.00	1019.30	
9	1130	1135	40	0	81.90	84.60	7.00	9.00	54.00	1019.20	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Fall 2013 (September 9 – 13, 2013)
Date: Thursday, September 12, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0730	0735	0	0	0	0	1	0	0	0	0	0	0	0		0	0.64
2	0800	0805	0	0	0	X	X	0	0	0	0	0	0	0	Glare from sun obscured view of Areas 4 and 4a	0	0.49
3	0830	0836	0	0	0	X	X	0	0	0	0	0	0	0	Coast Guard Cutter Gallatin departs B3	0	0.42
4	0900	0905	0	0	0	0	0	0	0	0	X	0	0	0		0	0.63
5	0930	0935	0	0	0	0	0	0	0	0	X	0	0	0		0	0.90
6	1000	1005	0	0	0	0	0	0	0	0	0	0	0	0		1	1.29
7	1030	1035	0	0	0	0	1	0	0	0	0	0	0	0	Lone dolphin observed	1	1.95
8	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		1	2.49
9	1130	1135	0	0	0	0	0	0	0	0	0	0	0	0		1	2.99
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0730	0735	20	0	77.70	84.40	3.00	4.00	334.00	1018.50	
5	0930	0935	30	0	79.90	84.40	4.00	6.00	20.00	1019.30	Rain just south of NS Mayport
9	1130	1135	40	0	81.90	84.60	7.00	9.00	54.00	1019.20	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Monday, March 04, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Annie Howard

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1400	1405	0	0	1	2	0	X	X	0	0	0	0	X		2	4.28
2	1430	1435	0	0	0	0	0	X	X	0	0	0	0	X		2	4.07
3	1500	1505	0	0	0	0	0	X	X	0	0	1	0	X		2	3.65
4	1530	1535	0	0	0	0	0	X	X	0	0	0	0	X		2	3.15
5	1600	1605	0	0	0	0	2	X	X	0	0	0	0	X		2	2.58
6	1630	1635	0	0	0	0	1	X	X	0	0	0	0	X		2	1.91
7	1700	1705	0	0	1	0	0	X	X	0	0	0	0	X		2	1.38
8	1730	1735	0	1	2	2	2	X	X	0	0	0	0	X		2	0.96
9	1800	1805	0	3	1	0	0	X	X	0	0	0	0	X		2	0.54
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1400	1405	0	0.00	51.26	60.98	8.55	9.52	69.00	1022.40	
5	1600	1605	0	0.00	55.22	61.34	4.66	10.30	113.00	1021.90	
9	1800	1805	0	0.00	55.40	60.44	4.27	6.61	157.00	1022.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Monday, March 04, 2013
Observation Point: Other
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1400	1405	0	0	0	0	0	0	0	0	X	0	0	X		2	4.28
2	1430	1435	0	0	0	0	0	0	0	0	X	0	0	X		2	4.07
3	1500	1505	0	0	0	0	0	0	1	0	X	0	0	X	Dolphin moving toward area 2	2	3.65
4	1530	1535	0	5	1	0	0	0	0	0	X	0	0	X	Dolphins surfaced near observer, moving northward toward area 1	2	3.15
5	1600	1600	0	0	0	0	0	0	0	0	X	0	0	X		2	2.58
6	1630	1635	0	0	0	0	0	0	0	0	X	0	0	X		2	1.91
7	1700	1705	0	0	0	1	0	0	0	0	X	0	0	X		2	1.38
8	1730	1735	0	0	0	4	0	0	0	0	X	0	0	X		2	0.96
9	1800	1805	0	0	0	0	0	6	0	0	X	0	0	X	Dolphins again surfaced near obsever, followed in wake of Hunter as it departed	2	0.54
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1400	1405	0	0.00	51.26	60.98	8.55	9.52	69.00	1022.40	
5	1630	1635	0	0.00	55.22	61.34	4.66	10.30	113.00	1021.90	
9	1800	1805	0	0.00	55.40	60.44	4.27	6.61	157.00	1022.10	

Other General Notes

No boat docked in Slip B-2. Observer stationed at this point. Observations made from atop a 4-foot high power block

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Tuesday, March 05, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Annie Howard

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0715	0720	0	0	0	0	0	X	X	0	0	0	0	X		0	0.37
2	0745	0750	0	0	0	0	0	X	X	0	0	0	0	X		0	0.11
3	0815	0820	0	0	0	0	2	X	X	0	0	0	0	X		0	0.04
4	0845	0850	0	0	0	0	0	X	X	0	0	0	0	X		0	-0.01
5	0915	0920	0	0	0	0	0	X	X	0	0	0	0	X		1	0.05
6	0945	0950	0	0	0	0	0	X	X	0	0	0	0	X		1	0.38
7	1015	1020	0	0	0	0	0	X	X	1	0	1	0	X		1	0.82
8	1045	1050	0	0	0	0	0	X	X	0	0	0	0	X		2	1.38
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	5	0	48.56	59.72	1.75	2.33	234.00	1023.70	
5	0915	0920	0	0	55.40	59.90	8.36	10.69	236.00	1023.40	
8	1045	1050	0	0	60.44	59.90	11.08	13.22	232.00	1022.70	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Tuesday, March 05, 2013
Observation Point: Other
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0715	0720	0	0	0	0	0	0	0	0	X	0	0	X		0	0.37
2	0745	0750	0	0	0	0	0	0	0	0	X	0	0	X		0	0.11
3	0815	0820	0	0	0	0	0	0	0	0	X	0	0	X		0	0.04
4	0845	0850	0	0	0	0	0	0	0	0	X	0	0	X		0	-0.01
5	0915	0920	0	0	0	0	0	0	0	0	X	0	0	X		1	0.05
6	0945	0950	0	0	0	1	2	0	0	0	X	0	0	X		1	0.38
7	1015	1020	0	0	0	1	0	0	0	0	X	0	0	X		1	0.82
8	1045	1050	0	0	0	0	0	0	0	0	X	0	0	X		2	1.38
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	5	0	48.56	59.72	1.75	2.33	234.00	1023.70	
5	0915	0920	0	0	55.40	59.90	8.36	10.69	236.00	1023.40	
8	1045	1050	0	0	60.44	59.90	11.08	13.22	232.00	1022.70	

Other General Notes

Observations made from B2

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Tuesday, March 05, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Annie Howard

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1430	1435	0	1	0	0	0	X	X	0	0	0	0	X		1	4.04
2	1500	1505	0	0	0	0	0	X	X	0	0	0	0	X		1	3.99
3	1530	1535	0	0	0	0	0	X	X	0	0	0	0	X		1	3.73
4	1600	1605	0	0	0	0	0	X	X	0	0	0	0	X		1	3.55
5	1630	1635	0	0	0	0	0	X	X	0	0	0	0	X		2	3.10
6	1700	1705	0	0	0	0	0	X	X	0	0	1	0	X		2	2.44
7	1730	1735	0	0	0	0	0	X	X	0	0	0	0	X		2	1.85
8	1800	1805	0	0	0	0	0	X	X	0	0	0	0	X		1	1.29
9	1830	1835	0	1	1	0	0	X	X	1	0	0	0	X		1	0.82
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1430	1435	5	0.00	70.52	61.88	13.61	20.22	235.00	1018.20	
5	1630	1635	5	0.00	71.78	62.06	19.44	21.96	237.00	1016.40	
9	1830	1835	5	0.00	69.26	60.98	13.02	19.83	227.00	1015.40	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Tuesday, March 05, 2013
Observation Point: Other
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1430	1435	0	0	0	0	0	0	0	0	X	0	0	X		1	4.04
2	1500	1505	0	0	0	0	0	0	0	0	X	0	0	X		1	3.99
3	1530	1535	0	0	0	0	0	0	0	0	X	0	0	X		1	3.73
4	1600	1605	0	0	0	0	0	0	0	0	X	0	0	X		1	3.55
5	1630	1635	0	0	0	0	0	1	0	0	X	0	0	X	Dolphin moved into areas 9 and 10	2	3.10
6	1700	1705	0	0	0	0	0	0	0	0	X	0	0	X		2	2.44
7	1730	1735	0	0	0	1	0	0	0	0	X	2	0	X	mother and calf? Swam together.	2	1.85
8	1800	1805	0	0	0	0	0	0	0	0	X	0	0	X		1	1.29
9	1830	1835	0	0	0	0	0	3	0	0	X	0	0	X	Dolphins surfaced in front of observer near pier	1	0.82
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1430	1435	5	0.00	70.52	61.88	13.61	20.22	235.00	1018.20	
5	1630	1635	5	0.00	71.78	62.06	19.44	21.96	237.00	1016.40	
9	1830	1835	5	0.00	69.26	60.98	13.02	19.83	227.00	1015.40	

Other General Notes

Observations made from slip B-2

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Wednesday, March 06, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Annie Howard

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0715	0720	0	0	0	0	0	X	X	0	0	0	0	X		2	0.24
2	0745	0750	0	0	0	0	0	X	X	0	0	0	0	X		2	-0.29
3	0815	0820	0	0	0	0	0	X	X	0	0	0	0	X		3	-0.74
4	0845	0850	0	0	0	0	0	X	X	0	0	0	0	X		3	-1.08
5	0915	0920	0	0	0	0	0	X	X	0	0	1	0	X		3	-0.92
6	0945	0950	0	0	0	0	0	X	X	0	0	0	0	X		3	-0.82
7	1015	1020	0	0	0	0	0	X	X	0	0	0	0	X		3	-0.73
8	1045	1050	0	0	0	0	0	X	X	0	0	0	0	X		3	-0.25
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	0	0	45.32	60.62	16.71	22.35	292.00	1017.80	
5	0915	0920	0	0	46.22	59.54	20.61	27.02	307.00	1018.60	
8	1045	1050	0	0	48.56	59.72	19.24	24.30	297.00	1018.80	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Wednesday, March 06, 2013
Observation Point: Other
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0715	0720	0	0	0	0	0	0	0	0	X	0	0	X		2	0.24
2	0745	0750	0	0	0	0	0	0	0	0	X	0	0	X		2	-0.29
3	0815	0820	0	0	0	0	0	0	0	0	X	0	0	X		3	-0.74
4	0845	0850	0	0	0	0	0	0	0	0	X	0	0	X		3	-1.08
5	0915	0920	0	0	0	0	0	0	0	0	X	0	0	X	British Ship moved into slip B-2. Monitor moved to	3	-0.92
6	0945	0950	0	0	X	X	X	0	0	0	0	0	0	0		3	-0.82
7	1015	1020	0	0	X	X	X	0	0	0	0	0	0	0		3	-0.73
8	1045	1050	0	0	X	X	X	0	0	0	0	0	0	0		3	-0.25
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	0	0	45.32	60.62	16.71	22.35	292.00	1017.80	
5	0915	0920	0	0	46.22	59.54	20.61	27.02	307.00	1018.60	
8	1045	1050	0	0	48.56	59.72	19.24	24.30	297.00	1018.80	

Other General Notes

Observer moved from slip B-2 to northwest corner of B-3/C-1 when British ship anchored at B-2

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Wednesday, March 06, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Annie Howard

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1430	1435	0	0	0	0	0	X	X	0	2	0	0	X		2	2.96
2	1500	1504	0	0	0	0	0	X	X	0	0	0	0	X		2	3.19
3	1530	1535	0	0	0	0	0	X	X	0	0	0	0	X		2	3.31
4	1600	1605	0	0	0	1	0	X	X	0	0	0	0	X		2	3.35
5	1630	1635	0	0	0	0	0	X	X	0	0	0	0	X		2	3.38
6	1700	1705	0	0	0	0	0	X	X	0	0	0	0	X		2	3.11
7	1730	1735	0	0	0	1	0	X	X	0	0	0	0	X		2	2.69
8	1800	1805	0	0	0	0	0	X	X	0	0	0	0	X		2	2.18
9	1830	1835	0	1	0	1	0	X	X	0	0	0	0	X		2	1.58
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1430	1435	0	0.00	55.04	60.80	18.27	22.35	293.00	1016.00	
5	1630	1635	0	0.00	55.22	61.88	17.11	22.74	289.00	1016.60	
9	1830	1835	0	0.00	51.98	61.34	12.83	18.08	318.00	1018.60	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Wednesday, March 06, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1430	1435	0	0	X	X	X	0	0	0	0	0	0	0		2	2.96
2	1500	1505	0	0	X	X	X	0	0	0	0	0	0	0		2	3.19
3	1530	1535	0	0	X	X	X	2	0	0	0	0	0	0		2	3.31
4	1600	1605	0	0	X	X	X	0	0	0	0	0	0	0		2	3.35
5	1630	1635	0	0	X	X	X	0	0	0	0	0	0	0		2	3.38
6	1700	1705	X	0	0	0	0	0	0	0	X	X	0	X	Moved Back to B-2 in front of British ship	2	3.11
7	1730	1735	X	0	0	0	0	1	0	0	X	X	0	X	Dolphin swimming toward section 1	2	2.69
8	1800	1805	X	0	0	0	0	3	0	0	X	X	0	X	All three swimming together moving toward sections 1 and 2	2	2.18
9	1830	1835	X	0	0	0	0	0	0	0	X	X	0	X		2	1.58
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1430	1435	0	0.00	55.04	60.80	18.27	22.35	293.00	1016.00	
5	1630	1635	0	0.00	55.22	61.88	17.11	22.74	289.00	1016.60	
9	1830	1835	0	0.00	51.98	61.34	12.83	18.08	318.00	1018.60	

Other General Notes

Observer moved back to B-2 off bow of British ship, as it afforded a better view of most of turning basin

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Thursday, December 13, 2012
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Annie Howard

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0715	0720	0	0	0	0	0	X	X	0	0	0	0	X		1	2.78
2	0745	0750	0	0	0	0	1	X	X	0	0	0	0	X		1	2.03
3	0815	0820	0	0	0	0	0	X	X	0	0	0	0	X		1	1.43
4	0845	0850	0	0	0	0	0	X	X	0	0	0	0	X		1	0.91
5	0915	0920	0	0	0	0	0	X	X	0	0	0	0	X		1	0.41
6	0945	0950	0	0	0	0	0	X	X	0	0	0	0	X		1	0.16
7	1015	1020	0	0	0	0	0	X	X	0	0	0	0	X		1	-0.01
8	1045	1050	0	0	0	0	0	X	X	0	0	0	0	X		1	-0.06
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	0	0	38.84	61.34	9.33	12.05	331.00	1024.50	
5	0915	0920	0	0	45.68	59.54	10.69	15.75	14.00	1025.60	
8	1045	1050	0	0	47.30	59.72	5.44	12.44	16.00	1025.70	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Spring 2013 (March 4 – 8, 2013)
Date: Thursday, March 07, 2013
Observation Point: Other
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0715	0720	X	2	0	0	0	0	0	0	X	0	0	X		1	2.78
2	0745	0750	X	0	0	0	0	0	0	0	X	0	0	X		1	2.03
3	0815	0820	X	0	0	0	0	0	0	0	X	0	0	X		1	1.43
4	0845	0850	X	0	0	0	0	0	0	0	X	0	0	X		1	0.91
5	0915	0920	X	0	0	0	0	0	0	0	X	0	0	X		1	0.41
6	0945	0950	X	0	0	0	0	0	0	0	X	0	0	X		1	0.16
7	1015	1020	X	0	0	0	0	0	0	0	X	0	0	X		1	-0.01
8	1045	1050	X	0	0	0	0	0	0	0	X	0	0	X		1	-0.06
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0715	0720	0	0	38.84	61.34	9.33	12.05	331.00	1024.50	
5	0915	0920	0	0	45.68	59.54	10.69	15.75	14.00	1025.60	
8	1045	1050	0	0	47.30	59.72	5.44	12.44	16.00	1025.70	

Other General Notes

Observations made from slip B-2. Observations made from atop a 4 foot high power block

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Monday, June 03, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	0	0	0	0	0	X	X	0	0	X	X	X		1	2.56
2	1600	1605	0	0	0	0	0	X	X	0	0	X	X	X		1	3.08
3	1630	1635	0	0	0	0	0	X	X	0	0	X	X	X	started 2 minutes early because of storm approaching.	2	4.20
4	1700	1705	0	0	0	0	0	X	X	0	0	X	X	X		1	4.53
5	1730	1735	0	0	0	0	0	X	X	0	0	X	X	X	low visibility, heavy rain, and lightning	1	4.72
6	1800	1805	0	0	0	0	5	X	X	0	0	X	X	X	5 Dolphin in 4a	1	4.70
7	1830	1835	0	0	0	0	0	X	X	0	0	X	X	X		1	4.66
8	1900	1905	0	0	0	0	0	X	X	0	0	X	X	X	3 dolphin in river outside of survey area	1	4.37
9	1930	1935	0	0	0	0	5	X	X	0	0	X	X	X	5 in 4a, plus 3 dolphin in river	1	4.13
10	2000	2005	0	0	0	0	0	X	X	0	0	X	X	X	4 Dolphin outside of survey area	0	3.71
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18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	50	0.00	80.20	77.70	11.00	14.00	131.00	1020.20	
5	1730	1735	100	0.50	77.40	78.30	9.00	12.00	160.00	1014.00	Rain!
9	1930	1935	80	0.00	74.70	78.10	9.00	14.00	360.00	1015.80	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Monday, June 03, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1530	1535	0	0	0	0	0	0	0	0	0	0	0	0		1	2.56
2	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		1	3.08
3	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0	Thunderstorm moving in from southeast	2	4.20
4	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		1	4.53
5	1730	1735	0	X	X	X	X	0	X	X	X	0	0	X	Rain/Lightning, low visibility. Conducted from vehicle	1	4.72
6	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0	Rain cleared	1	4.70
7	1830	1835	0	0	0	0	0	0	0	0	0	X	0	0	USS Carney moving into berth B-1	1	4.66
8	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	4.37
9	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	4.13
10	2000	2005	0	0	0	0	0	0	0	0	0	0	0	0		0	3.71
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Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1530	1535	50	0.00	80.20	77.70	11.00	14.00	131.00	1020.20	
5	1730	1735	100	0.50	77.40	78.30	9.00	12.00	160.00	1014.00	Rain!
9	1930	1935	80	0.00	74.70	78.10	9.00	14.00	360.00	1015.80	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Tuesday, June 04, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0708	0713	0	0	0	0	0	X	X	X	0	X	X	X	Mantee sighted in area by navy personnel, 4 dolphin in river	0	3.94
2	0730	0735	0	0	0	0	1	X	X	X	0	X	X	X	1 dolphin in 4a	0	3.67
3	0800	0805	0	0	0	0	5	X	X	X	0	X	X	X	5 dolphin in 4a; 2 dolphin in river outside survey area	0	3.38
4	0830	0835	0	0	0	0	0	X	X	X	0	X	X	X	Ship moved in and docked at C-2, 2 minutes before survey. 10 dolphin in river	0	2.90
5	0900	0905	0	0	0	0	4	X	X	X	0	X	X	X	5 dolphin in river outside survey area	0	2.10
6	0930	0935	0	0	0	1	11	X	X	X	0	X	X	X	5 dolphin in river outside survey area	0	1.64
7	1000	1005	0	0	8	0	0	X	X	X	0	X	X	X	4 dolphin in river outside survey area	0	1.10
8	1030	1035	0	0	0	0	0	X	X	X	0	X	X	X		0	0.46
9	1100	1105	0	0	0	0	0	X	X	X	0	X	X	X		0	0.29
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18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0708	0713	75	0	75.00	78.10	6.00	7.00	236.00	1016.80	
5	0900	0905	100	0	76.50	78.80	6.00	8.00	235.00	1017.90	
9	1100	1105	90	0	80.20	79.90	7.00	9.00	227.00	1017.90	

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Tuesday, March 05, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0708	0713		0	0	0	0	0	0	0	0	0	0	0	Manatee reported in basin. Not observed.	0	3.94
2	0730	0735	0	0	0	0	0	0	0	0	0	0	0	0		0	3.67
3	0800	0805	0	0	0	0	0	0	0	0	0	0	0	0		0	3.38
4	0830	0835	0	0	0	0	0	0	0	0	4	0	0	0	Maybe 5 dolphin. Difficult to count	0	2.90
5	0900	0905	0	0	0	0	0	0	0	0	0	0	0	0	Manatee in 5? Unidentified	0	2.10
6	0930	0935	0	0	0	0	3	0	0	0	0	0	0	0		0	1.64
7	1000	1005	0	0	0	0	4	0	0	7	0	0	0	0	Large group.	0	1.01
8	1030	1035	0	0	0	0	0	0	0	0	0	0	0	0		0	0.46
9	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		0	0.29
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16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0708	0713	75	0	75.00	78.10	6.00	7.00	236.00	1016.80	
5	0900	0905	100	0	76.50	78.80	6.00	8.00	235.00	1017.90	
8	1100	1105	90	0	80.20	79.90	7.00	9.00	227.00	1017.90	

Other General Notes

Observations made from B2

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Tuesday, June 04, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1600	1605	0	0	0	0	0	X	X	X	0	X	X	X	1 manatee in Area 8	0	2.86
2	1630	1635	0	0	0	0	0	X	X	X	0	X	X	X		0	3.38
3	1700	1705	0	0	0	0	0	X	X	X	0	X	X	X		0	3.75
4	1730	1735	0	0	0	0	0	X	X	X	0	X	X	X		1	4.11
5	1800	1805	0	0	0	0	0	X	X	X	0	X	X	X		0	4.45
6	1830	1835	0	0	0	0	0	X	X	X	0	X	X	X		0	4.65
7	1900	1905	0	0	0	0	3	X	X	X	0	X	X	X	5 dolphin in river outside of survey area	0	4.72
8	1930	1935	0	0	0	0	0	X	X	X	0	X	X	X	2 dolphin in river outside of survey area	1	4.68
9	2000	2005	0	0	0	0	3	X	X	X	0	X	X	X	5 dolphin in river outside of survey area	1	4.46
10																	
11																	
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14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1600	1605	100	trace	72.00	80.80	3.00	4.00	233.00	1016.60	
5	1800	1805	75	0.00	79.00	77.90	3.00	5.00	165.00	1016.40	
9	2000	2005	75	0.00	77.70	77.70	4.00	6.00	144.00	1017.00	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Tuesday, June 04, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		0	2.86
2	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0		0	3.38
3	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		0	3.75
4	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		1	4.11
5	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		0	4.45
6	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		0	4.65
7	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		0	4.72
8	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	4.68
9	2000	2005	0	0	0	0	0	0	0	0	0	0	0	0		1	4.46
10																	
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12																	
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14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1600	1605	100	trace	72.00	80.80	3.00	4.00	233.00	1016.60	a few drops of rain falling after shower
5	1800	1805	75	0.00	79.00	77.90	3.00	5.00	165.00	1016.40	
9	2000	2005	75	0.00	77.70	77.70	4.00	6.00	144.00	1017.00	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Wednesday, June 05, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	0	0	0	0	0	X	X	X	0	X	X	X		0	3.94
2	0730	0735	0	0	0	0	0	X	X	X	0	X	X	X		0	4.06
3	0800	0805	0	0	0	0	1	X	X	X	0	X	X	X	1 dolphin in river outside survey area	0	3.99
4	0830	0835	0	0	0	0	1	X	X	X	0	X	X	X	2 dolphin in river outside survey area	0	3.72
5	0900	0905	0	0	0	0	10	X	X	X	0	X	X	X		0	3.31
6	0930	0935	0	0	0	3	1	X	X	X	0	X	X	X		0	2.76
7	1000	1005	0	0	0	0	0	X	X	X	0	X	X	X		0	2.12
8	1030	1035	0	0	0	0	0	X	X	X	0	X	X	X		0	1.45
9	1100	1105	0	0	0	0	1	X	X	X	0	X	X	X		0	0.88
10																	
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12																	
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14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100	trace	74.10	77.90	3.00	4.00	203.00	1017.80	
5	0900	0905	100	0	75.90	78.10	3.00	7.00	211.00	1018.30	
9	1100	1105	100	0	77.50	79.00	4.00	6.00	248.00	1018.60	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Wednesday, June 05, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	0	0	0	0	0	0	0	0	0	0	0	0		0	3.94
2	0730	0735	0	0	0	0	0	0	0	0	0	0	0	0		0	4.06
3	0800	0805	0	0	0	0	0	0	0	0	0	0	0	0		0	3.99
4	0830	0835	0	0	0	0	0	0	0	0	0	0	0	0		0	3.72
5	0900	0905	0	0	0	0	0	0	0	0	0	0	0	0	Coast Guard Cutter moved into slip B-2.	0	3.31
6	0930	0935	0	0	0	0	0	0	0	0	0	0	0	0		0	2.76
7	1000	1005	0	0	0	0	0	0	0	0	0	0	0	0		0	2.12
8	1030	1035	0	0	0	0	0	0	0	0	0	0	0	0		0	1.45
9	1100	1105	0	0	0	0	0	0	0	0	0	0	0	0		0	0.88
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100	Trace	74.10	77.90	3.00	4.00	203.00	1017.80	
5	0900	0905	100	0	75.90	78.10	3.00	7.00	211.00	1018.30	
9	1100	1105	100	0	77.50	79.00	4.00	6.00	248.00	1018.60	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Wednesday, June 05, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1600	1605	0	0	0	0	0	X	X	X	0	X	X	X		1	2.34
2	1630	1635	0	0	0	0	0	X	X	X	0	X	X	X		1	2.99
3	1700	1705	0	0	0	0	0	X	X	X	0	X	X	X		1	2.29
4	1730	1735	0	0	0	0	0	X	X	X	0	X	X	X		1	3.82
5	1800	1805	0	0	0	0	5	X	X	X	0	X	X	X	2 dolphins in river outside survey area	1	4.34
6	1830	1835	0	0	0	0	0	X	X	X	0	X	X	X	10 dolphin in river outside survey area	1	4.64
7	1900	1905	0	0	0	0	0	X	X	X	0	X	X	X	6 dolphin in river outside survey area	1	4.81
8	1930	1935	0	0	0	0	0	X	X	X	0	X	X	X	5 dolphin in river outside survey area	1	4.97
9	2000	2005	0	0	0	0	7	X	X	X	0	X	X	X	9 dolphin in river outside survey area	1	4.95
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1600	1605	100	0.00	82.00	81.30	3.00	6.00	212.00	1016.80	
5	1800	1805	100	0.00	75.70	78.10	7.00	12.00	209.00	1016.60	
9	2000	2005	100	0.00	75.90	77.50	5.00	9.00	211.00	1016.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Wednesday, June 05, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1600	1605	0	0	0	0	0	0	0	0	0	0	0	0		1	2.34
2	1630	1635	0	0	0	0	0	0	0	0	0	0	0	0	abundance of laughing gulls flying over and in water	1	2.99
3	1700	1705	0	0	0	0	0	0	0	0	0	0	0	0		1	3.39
4	1730	1735	0	0	0	0	0	0	0	0	0	0	0	0		1	3.82
5	1800	1805	0	0	0	0	0	0	0	0	0	0	0	0		1	4.34
6	1830	1835	0	0	0	0	0	0	0	0	0	0	0	0		1	4.64
7	1900	1905	0	0	0	0	0	0	0	0	0	0	0	0		1	4.81
8	1930	1935	0	0	0	0	0	0	0	0	0	0	0	0		1	4.97
9	2000	2005	0	0	0	0	0	0	0	0	0	0	0	0		1	4.95
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1600	1605	100	0.00	82.00	81.30	3.00	6.00	212.00	1016.80	
5	1800	1805	100	0.00	75.70	78.10	7.00	12.00	209.00	1016.60	
9	2000	2005	100	0.00	75.90	77.50	5.00	9.00	211.00	1016.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Thursday, June 06, 2013
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Rob Myers

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	0	0	0	0	0	X	X	X	0	X	X	X	Tropical storm approaching	1	4.10
2	0730	0735	0	0	0	0	0	X	X	X	0	X	X	X	Rain, extremely low visibility, dark	2	4.40
3	0800	0805	0	0	0	0	0	X	X	X	0	X	X	X	light rain, some white capping in river	2	4.45
4	0830	0835	0	0	0	0	0	X	X	X	0	X	X	X	light rain	2	4.50
5	0900	0905	0	0	0	0	0	X	X	X	0	X	X	X	light rain	2	4.46
6	0930	0935	0	0	0	0	2	X	X	X	0	X	X	X	light rain	2	4.11
7	1000	1005	0	0	0	0	0	X	X	X	0	X	X	X	4 dolphin in river outside survey area	2	3.77
8	1030	1035	0	0	0	0	0	X	X	X	0	X	X	X	1 dolphin in river outside survey area	2	3.11
9	1100	1105	0	0	0	0	0	X	X	X	0	X	X	X	Rain, high winds with strong gusts	2	2.42
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100	trace	77.70	77.70	8.00	9.00	101.00	1012.80	Tropical Storm Warning in Effect
5	0900	0905	100	0.33	73.20	77.40	10.00	16.00	88.00	1013.50	
9	1100	1105	100	0.72	75.20	77.50	8.00	13.00	127.00	1013.20	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Summer 2013 (June 3 – 7, 2013)
Date: Thursday, June 06, 2013
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	0	0	0	0	0	0	0	0	0	0	0	0		1	4.10
2	0730	0735	0	0	0	X	X	0	0	0	X	0	0	0	Rainfall significantly limits visibility	2	4.40
3	0800	0805	0	0	0	0	X	0	0	0	X	X	0	0	Bands of rain from Tropical Storm Andrea moving through	2	4.45
4	0830	0836	0	0	0	0	X	0	0	0	0	0	0	0		2	4.50
5	0900	0905	0	0	0	0	X	0	0	0	0	0	0	0		2	4.46
6	0930	0935	0	0	0	0	X	0	0	0	0	0	0	0		2	4.11
7	1000	1005	0	0	0	0	X	0	0	0	0	0	0	0		2	3.77
8	1030	1035	0	0	0	0	X	0	0	0	0	0	0	0		2	3.11
9	1100	1105	0	0	0	0	X	0	0	0	0	0	0	0		2	2.42
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100	trace	77.70	77.70	8.00	9.00	101.00	1012.80	Tropical Storm Warning in Effect
5	0900	0905	100	0.33	73.20	77.40	10.00	16.00	88.00	1013.50	
9	1100	1105	100	0.72	75.20	77.50	8.00	13.00	127.00	1013.20	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Monday, December 10, 2012
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1230	1235	0	0	0	0	0	0	X	X	0	X	X	X	at least 3 were observed in Grid #4a after the survey period ended	0	0.62
2	1300	1305	0	0	0	0	0	0	X	X	0	X	X	X		1	1.01
3	1330	1335	0	0	0	0	0	1	X	X	0	X	X	X	1 was observed in Grid #4 after the survey period ended (likely the same one observed in Grid #5)	1	1.51
4	1400	1405	0	0	0	0	0	1	X	X	4	X	X	X	1 of the 4 in Grid #8 was a young calf	1	2.08
5	1430	1435	0	0	0	0	0	0	X	X	0	X	X	X		1	2.58
6	1500	1505	0	0	0	0	0	0	X	X	0	X	X	X	1 in Grid #8 @ 1515, and 1 in Grid #3 @ 1522	1	3.10
7	1530	1535	0	0	0	1	0	0	X	X	2	X	X	X		2	3.54
8	1600	1605	-	-	-	-	-	-	-	-	-	-	-	-	survey skipped; thunder storm w/ heavy rain	2	3.97
9	1630	1635	0	0	0	4	0	0	X	X	1	0	0	X	moving into the basin	1	4.27
10	1700	1705	0	0	0	0	3	0	X	X	0	0	0	X		0	4.51
11	1730	1735	0	0	0	2	0	0	X	X	0	0	0	X	dark conditions; Sunset = 1726	0	4.77
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1230	1235	75		74.48	65.30	8.16	11.47	231.00	1015.10	
6	1500	1505	85		67.82	66.02	6.80	9.14	148.00	1012.50	
11	1730	1735	50		67.82	64.58	2.53	5.25	214.00	1012.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Monday, December 10, 2012
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Dennis Peters

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1230	1235	0	0	0	0	X	0	0	0	X	0	0	0	surface birds resting, no presence of bait fish; sea gate is open	0	0.62
2	1300	1305	0	0	0	0	X	0	0	0	X	0	0	0	surface birds resting, no presence of bait fish; sea gate is open; helo doing touch and goes, destroyer #64 departed	1	1.01
3	1330	1335	0	0	0	0	X	0	0	2	X	0	0	0	two adults close to closed sea gate	1	1.51
4	1400	1405	0	0	0	1	X	0	0	0	X	0	0	0	one adult close to closed sea gate & patrol boat	1	2.08
5	1430	1435	0	0	0	0	X	0	0	0	X	0	0	0	opened sea gate	1	2.58
6	1500	1505	0	0	0	1	X	0	0	0	X	0	0	0	one adult close to closed sea gate & patrol boat; light drizzle	1	3.10
7	1530	1535	0	0	0	1	X	0	0	1	X	0	0	0	Destrioyer # 68 departed; winds building	2	3.54
8	1600	1605	-	-	-	-	-	-	-	-	-	-	-	-	survey skipped; thunder storm w/ heavy rain; sea gate closed	2	3.97
9	1630	1635	0	0	0	0	X	0	1	0	X	0	0	0	one adult; drizzle; small boat pulling boom; calm waters	1	4.27
10	1700	1705	0	0	0	0	X	0	0	0	X	0	0	0	flat calm	0	4.51
11	1730	1735	0	0	0	1	X	0	0	0	X	0	0	0	dark conditions, poor visability; Sunset = 1726	0	4.77
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1230	1235	75		74.48	65.30	8.16	11.47	231.00	1015.10	
6	1500	1505	85		67.82	66.02	6.80	9.14	148.00	1012.50	
11	1730	1735	50		67.82	64.58	2.53	5.25	214.00	1012.10	

Other General Notes

Only a portion of Grid #4 was visable from this observation point; observations made from atop a 4 foot high power block

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Tuesday, December 11, 2012
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	-	-	-	-	-	-	-	-	-	-	-	-	too dark & foggy; no survey; Sunrise = 0712	0	5.63
2	0730	0735	0	0	0	0	0	0	X	X	0	0	0	X	fog lifting, visability good	0	5.33
3	0800	0805	0	0	0	0	0	0	X	X	0	0	0	X	sky clearing, fog is gone	0	4.92
4	0830	0835	0	0	0	0	0	0	X	X	0	0	0	X		1	4.27
5	0900	09005	0	0	0	0	0	0	X	X	0	0	0	X	fog moving back in	1	3.42
6	0930	0935	0	0	0	0	0	0	X	X	0	0	0	X		1	2.35
7	1000	1005	0	0	0	0	5	0	X	X	0	0	0	X		1	1.63
8	1030	1035	0	0	0	0	0	0	X	X	0	0	0	X		1	0.91
9	1100	1105	0	0	0	0	0	0	X	X	0	0	0	X		1	0.29
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100		66.20	64.40	4.08	7.19	195.00	1014.90	
6	0930	0935	80		67.64	64.94	4.67	7.39	185.00	1016.40	
9	1100	1105	80		71.60	65.48	2.92	4.47	238.00	1017.20	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Tuesday, December 11, 2012
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Dennis Peters
Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	-	-	-	-	-	-	-	-	-	-	-	-	too dark & foggy; no survey; Sunrise = 0712	0	5.63
2	0730	0735	0	0	0	0	X	0	0	0	X	0	0	0	some fog remaining	0	5.33
3	0800	0805	0	0	0	0	X	0	0	0	X	2	0	0	mother & calf, headed towards corner of B/C; fog lifted	0	4.92
4	0830	0835	0	0	0	0	X	2	1	0	X	2	0	0	mother & calf, adult pair, plus a single adult (heading towards corner of B/C)	1	4.27
5	0900	09005	0	0	0	0	X	2	0	0	X	0	0	0	mother & calf, circling between ships	1	3.42
6	0930	0935	0	0	0	4	X	0	0	0	X	0	0	0	four adults leaving harbor towards sea gate	1	2.35
7	1000	1005	0	0	0	0	X	0	0	0	X	0	0	0	sea birds and cormorants feeding	1	1.63
8	1030	1035	0	0	0	0	X	0	0	0	X	0	0	0	cormorants feeding	1	0.91
9	1100	1105	0	0	0	0	X	0	0	0	X	0	0	0	cormorants feeding	1	0.29
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100		66.20	64.40	4.08	7.19	195.00	1014.90	
6	0930	0935	80		67.64	64.94	4.67	7.39	185.00	1016.40	
9	1100	1105	80		71.60	65.48	2.92	4.47	238.00	1017.20	

Other General Notes

Only a portion of Grid #4 was visable from this observation point; observations made from atop a 4 foot high power block

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Tuesday, December 11, 2012
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1300	1305	0	0	0	0	0	0	X	X	0	0	0	X		1	-0.13
2	1330	1335	0	0	0	0	0	0	X	X	0	0	0	X		2	0.13
3	1400	1405	0	0	0	1	2	0	X	X	0	0	0	X		2	0.60
4	1430	1435	0	0	0	0	3	0	X	X	0	0	0	X		2	1.15
5	1500	1505	0	0	0	0	1	0	X	X	0	0	0	X		2	1.73
6	1530	1535	0	0	0	1	0	0	X	X	0	0	0	X		1	2.36
7	1600	1605	0	0	0	2	2	0	X	X	0	0	0	X		1	2.99
8	1630	1635	0	0	0	0	1	0	X	X	0	0	0	X		1	3.51
9	1700	1705	0	0	0	2	0	0	X	X	0	0	0	X		1	3.93
10	1730	1735	0	0	0	0	0	0	X	X	0	0	0	X		1	4.36
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1300	1305	85		72.50	66.02	7.78	10.50	136.00	1016.50	
5	1500	1505	100		71.24	66.74	7.58	12.25	153.00	1015.90	
10	1730	1735	50		67.82	64.58	2.53	5.25	214.00	1012.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Tuesday, December 11, 2012
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Dennis Peters

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1300	1305	0	0	0	0	X	0	0	0	X	0	0	0	wind picked up; definite windrow diagonally through the center of the basin	1	-0.13
2	1330	1335	0	0	0	0	X	0	0	0	X	0	0	0	steady wind; definite windrow diagonally through the center of the basin; sea gate open	2	0.13
3	1400	1405	0	0	0	0	X	0	0	0	X	0	0	0	steady wind; definite windrow diagonally through the center of the basin; sea gate open	2	0.60
4	1430	1435	0	0	0	0	X	0	0	0	X	0	0	0	"Big Horn" departed from the basin; C2 empty	2	1.15
5	1500	1505	0	0	0	1	X	0	0	0	X	0	0	0	one adult close to sea gate near the Harbor Ops side	2	1.73
6	1530	1535	0	0	0	2	X	0	0	0	X	0	0	0	two adults near center of sea gate area	1	2.36
7	1600	1605	0	0	0	1	X	0	0	0	X	0	0	0	one adult close to sea gate area	1	2.99
8	1630	1635	0	0	0	0	X	0	0	0	X	0	0	0	"Hugo" arrived at B3	1	3.51
9	1700	1705	0	0	0	1	X	0	0	0	X	0	0	0	one adult close to sea gate area	1	3.93
10	1730	1735	0	0	0	2	X	0	0	0	X	0	0	0	two adults near center of sea gate area; Sunset = 1726	1	4.36
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1300	1305	85		72.50	66.02	7.78	10.50	136.00	1016.50	
5	1500	1505	100		71.24	66.74	7.58	12.25	153.00	1015.90	
10	1730	1735	50		67.82	64.58	2.53	5.25	214.00	1012.10	

Other General Notes

Only a portion of Grid #4 was visable from this observation point; observations made from atop a 4 foot high power block

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Wednesday, December 12, 2012
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	-	-	-	-	-	-	-	-	-	-	-	-	too dark & light drizzle; no survey; Sunrise = 0713	1	5.83
2	0730	0735	X	0	0	0	0	X	X	X	0	X	0	X	too hazy to see the far end of the basin	1	5.81
3	0800	0805	-	-	-	-	-	-	-	-	-	-	-	-	survey skipped due to poor visability	1	5.63
4	0830	0835	X	X	0	0	0	X	X	X	0	X	0	X		1	5.39
5	0900	09005	X	X	0	4	0	X	X	X	0	X	0	X		1	4.95
6	0930	0935	X	X	0	1	0	X	X	X	1	X	0	X		1	4.27
7	1000	1005	X	0	0	0	0	X	X	X	0	X	0	X		1	3.43
8	1030	1035	X	0	0	3	1	X	X	X	0	X	0	X	mother and calf in Grid #4	0	2.52
9	1100	1105	X	0	0	0	0	X	X	X	0	X	0	X		0	1.68
10	1130	1135	X	0	0	0	0	X	X	X	0	X	0	X		0	1.02
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100		60.08	64.58	6.42	10.30	20.00	1020.40	
5	0900	09005	100		58.46	64.58	5.64	7.97	23.00	1021.10	
10	1130	1135	100		60.08	65.30	6.42	8.55	329.00	1021.10	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Wednesday, December 12, 2012
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Dennis Peters

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	-	-	-	-	-	-	-	-	-	-	-	-	too dark & light drizzle; no survey; Sunrise = 0713	1	5.83
2	0730	0735	0	0	0	0	X	4	0	0	X	0	0	0	mother and calf, plus an adult pair; circling birds feeding; no rain yet	1	5.81
3	0800	0805	-	-	-	-	-	-	-	-	-	-	-	-	lightning and heavy rain; no survey conducted	1	5.63
4	0830	0835	0	0	0	0	X	0	0	0	X	0	0	0	light rain	1	5.39
5	0900	09005	-	-	-	-	-	-	-	-	-	-	-	-	heavy rain, white-out; no survey conducted	1	4.95
6	0930	0935	0	0	0	1	X	0	0	0	X	0	0	0	light rain; cormorants feeding, wind died down significantly	1	4.27
7	1000	1005	0	0	0	0	X	0	0	0	X	0	0	0	light rain	1	3.43
8	1030	1035	0	0	0	0	X	0	0	0	X	0	0	0	light rain; no wind	0	2.52
9	1100	1105	0	0	0	0	X	0	0	0	X	0	0	0	rain stopped; cormorants feeding	0	1.68
10	1130	1135	0	0	0	0	X	0	0	0	X	0	0	0	no rain; cormorants feeding	0	1.02
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100		60.08	64.58	6.42	10.30	20.00	1020.40	
5	0900	09005	100		58.46	64.58	5.64	7.97	23.00	1021.10	
10	1130	1135	100		60.08	65.30	6.42	8.55	329.00	1021.10	

Other General Notes

Only a portion of Grid #4 was visable from this observation point; observations made from atop a 4 foot high power block

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Wednesday, December 12, 2012
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1330	1335	X	0	0	0	0	X	X	X	0	X	0	X		0	-0.29
2	1400	1405	X	0	0	0	0	X	X	X	0	X	0	X		0	-0.06
3	1430	1435	X	0	0	0	0	X	X	X	0	X	0	X		1	0.33
4	1500	1505	X	0	0	0	1	X	X	X	0	X	0	X	2 more in St. John's River	1	0.88
5	1530	1535	X	0	0	1	0	X	X	X	0	X	0	X		1	1.37
6	1600	1605	X	0	0	0	0	X	X	X	0	X	0	X		1	2.17
7	1630	1635	X	0	0	0	0	X	X	X	0	X	0	X		1	2.69
8	1700	1705	X	0	0	0	0	X	X	X	0	X	0	X		1	3.41
9	1730	1735	X	0	0	0	0	X	X	X	0	X	0	X	low light; Sunset = 1726	1	3.97
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1330	1335	100		60.80	65.48	10.50	13.02	355.00	1020.20	
5	1530	1535	100		57.56	66.20	6.61	8.75	9.00	1020.40	
9	1730	1735	100		58.82	65.48	6.61	13.41	340.00	1021.60	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Wednesday, December 12, 2012
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 2 (Afternoon)

Marine Species Observer:
Printed Name: Dennis Peters

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	1330	1335	0	0	0	0	X	0	0	0	X	0	0	0	no rain; no to light wind	0	-0.29
2	1400	1405	0	0	0	0	X	0	0	0	X	0	0	0	no rain; light wind	0	-0.06
3	1430	1435	0	0	0	0	X	0	0	0	X	0	0	0	drizzle; temperature dropping; light wind	1	0.33
4	1500	1505	0	0	0	0	X	0	0	0	X	0	0	0	no rain; much cooler	1	0.88
5	1530	1535	0	0	0	3	X	0	0	0	X	0	0	0	rain; down pour just started	1	1.37
6	1600	1605	0	0	0	0	X	0	0	0	X	0	0	0	light to heavy rain	1	2.17
7	1630	1635	0	0	0	1	X	0	0	0	X	0	0	0	rain stopped; cool temperatures	1	2.69
8	1700	1705	0	0	0	0	X	0	0	0	X	0	0	0	rain stopped; cool temperatures	1	3.41
9	1730	1735	0	0	0	0	X	0	0	0	X	0	0	0	Sunset = 1726	1	3.97
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	1330	1335	100		60.80	65.48	10.50	13.02	355.00	1020.20	
5	1530	1535	100		57.56	66.20	6.61	8.75	9.00	1020.40	
9	1730	1735	100		58.82	65.48	6.61	13.41	340.00	1021.60	

Other General Notes

Only a portion of Grid #4 was visable from this observation point; observations made from atop a 4 foot high power block

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Thursday, December 13, 2012
Observation Point: Forth Story of the Harbor Operations Building
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Todd Wilkinson

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	-	-	-	-	-	-	-	-	-	-	-	-	too dark & light drizzle; no survey; Sunrise = 0713	1	5.92
2	0730	0735	X	0	0	0	0	X	X	X	0	X	X	X	low visability	1	6.20
3	0800	0805	0	0	0	0	0	X	X	X	0	X	X	X		1	6.40
4	0830	0835	0	0	0	0	0	X	X	X	0	X	X	X		1	6.45
5	0900	09005	0	0	0	0	0	X	X	X	0	X	X	X		2	6.37
6	0930	0935	0	0	0	1	0	X	X	X	0	X	X	X	moving towards harbor entrance	2	6.13
7	1000	1005	0	0	0	1	0	X	X	X	0	X	X	X		1	5.65
8	1030	1035	0	0	0	1	0	X	X	X	0	X	X	X		1	5.05
9	1100	1105	0	0	0	0	0	X	X	X	0	X	X	X		1	4.35
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100		51.98	64.76	11.08	15.36	352.00	1024.00	
5	0900	09005	100		52.16	64.76	12.83	18.08	1.00	1025.60	
9	1100	1105	100		50.90	64.94	9.53	14.97	352.00	1026.50	

Other General Notes

NS Mayport Dolphin Surveys - Data Collection Sheet

Seasonal, Shore-based, Visual Surveys

Seasonal Quarter: Winter 2012 (December 10 - 13, 2013)
Date: Thursday, December 13, 2012
Observation Point: Ground Level at the Northwest Corner of B-3 and C-1 Pier
Survey Period: 1 (Morning)

Marine Species Observer:
Printed Name: Dennis Peters

Signature:

Visual Suvey (#)	Start Time (24 hrs)	End Time (24 hrs)	Dolphin Observations (#/Grid) (X = No Visual Area-of-Sight [Grid Obscured])												Observation Notes (Group Size, Behavior, Calves, Other Marine Species)	Beaufort SS (0 - 12)	Tide Data (Ref: MLLW) (Ft)
			1	2	3	4	4a	5	6	7	8	9	10	11			
1	0700	0705	-	-	-	-	-	-	-	-	-	-	-	-	too dark & light drizzle; no survey; Sunrise = 0713	1	5.92
2	0730	0735	0	0	0	0	X	0	0	0	X	0	0	0		1	6.20
3	0800	0805	2	1	2	0	X	0	0	0	X	0	0	0	mother and calf in Grid #1, plus an adult pair in Grid 3	1	6.40
4	0830	0835	2	0	0	0	X	0	0	0	X	0	0	0	mother and calf first seen in Grid #1, then traveled into Grid #5, then into Grid #9	1	6.45
5	0900	09005	0	0	0	0	X	2	0	0	X	0	0	0	mother and calf first seen in Grid #5, then traveled into Grid #9; breezy	2	6.37
6	0930	0935	2	0	0	0	X	0	0	0	X	0	0	0	mother and calf first seen in Grid #1, then traveled into Grid #5, then into Grid #9	2	6.13
7	1000	1005	0	0	0	0	X	2	0	0	X	0	0	0	mother and calf first seen in Grid #5, then traveled into Grid #1	1	5.65
8	1030	1035	0	0	2	0	X	0	0	0	X	0	0	0	mother and calf first seen in Grid #3, then traveled into Grid #2, then into Grid #1	1	5.05
9	1100	1105	0	0	0	0	X	0	0	0	X	2	0	0	mother and calf first seen in Grid #9, then traveled into Grid #5, then into Grid #1	1	4.35
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	

Meterological Data

(Source: Mayport [Bar Pilots Dock], FL; Station ID: 8720218)

Visual Period	Start Time (24 hrs)	End Time (24 hrs)	Cloud Cover (%)	Rain Fall (cm)	Air Temp (°F)	Water Temp (°F)	Wind Speed (knots)	Wind Gusts (knots)	Wind Dierction (true)	Barametric Pressure (Mb)	NOTES
1	0700	0705	100		51.98	64.76	11.08	15.36	352.00	1024.00	
5	0900	09005	100		52.16	64.76	12.83	18.08	1.00	1025.60	
9	1100	1105	100		50.90	64.94	9.53	14.97	352.00	1026.50	

Other General Notes

Only a portion of Grid #4 was visable from this observation point; observations made from atop a 4 foot high power block

APPENDIX C
SNAPSHOT OF *TAKE* ESTIMATIONS

Return to SUMMARY

North Atlantic Right Whale:

Density (#/km^2)	Pile Driving	Threshold (dB re 1 µPa rms)	Distance (m)	Wharf Bravo							South Wall			Wharf Echo							Wharf Foxtrot				
					Pier #1		Pier #2		Pier #3			Pier #1			Pier #1		Pier #2		Pier #3			Pier #1		Pier #2	
				Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)
0.00005	Vibratory Steel	Level A (injury): 180	0.74	0.00045	45	0	45	0	45	0	0.000122	45	0	0.00037	45	0	45	0	45	0	0.000233	0	0	45	0
		Level B (behavioral): 120	7,356	2.96	45	0	45	0	45	0	2.96	45	0	2.96	45	0	45	0	45	0	2.96	0	0	45	0
	Impact (contingency) Steel	Level A (injury): 180	39.8	0.02502	20	0	20	0	20	0	0.0067	20	0	0.02043	20	0	20	0	20	0	0.0173	0	0	20	0
		Level B (behavioral): 160	858	0.5868	20	0	20	0	20	0	0.4724	20	0	0.7562	20	0	20	0	20	0	0.8402	0	0	20	0
	Vibratory Polymeric	Level A (injury): 180	0.16	0.000097	5	0	5	0	5	0	0.00026	5	0	0.000073	5	0	5	0	5	0	0.00005	0	0	5	0
		Level B (behavioral): 120	1,585	0.8439	5	0	5	0	5	0	0.9746	5	0	0.9247	5	0	5	0	5	0	0.9746	0	0	5	0
	Impact (contingency) Polymeric	Level A (injury): 180	10	0.00618	20	0	20	0	20	0	0.00166	20	0	0.00469	20	0	20	0	20	0	0.00342	0	0	20	0
		Level B (behavioral): 120	46.4	0.02919	20	0	20	0	20	0	0.00786	20	0	0.02427	20	0	20	0	20	0	0.02116	0	0	20	0

Humpback Whale

Density (#/km^2)	Pile Driving	Threshold (dB re 1 µPa rms)	Distance (m)	Wharf Bravo							South Wall			Wharf Echo							Wharf Foxtrot				
					Pier #1		Pier #2		Pier #3			Pier #1			Pier #1		Pier #2		Pier #3			Pier #1		Pier #2	
				Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)
0.000113	Vibratory Steel	Level A (injury): 180	0.74	0.00045	45	0	45	0	45	0	0.000122	45	0	0.00037	45	0	45	0	45	0	0.000233	45	0	45	0
		Level B (behavioral): 120	7,356	2.96	45	0	45	0	45	0	2.96	45	0	2.96	45	0	45	0	45	0	2.96	45	0	45	0
	Impact (contingency) Steel	Level A (injury): 180	39.8	0.02502	20	0	20	0	20	0	0.0067	20	0	0.02043	20	0	20	0	20	0	0.0173	20	0	20	0
		Level B (behavioral): 160	858	0.5868	20	0	20	0	20	0	0.4724	20	0	0.7562	20	0	20	0	20	0	0.8402	20	0	20	0
	Vibratory Polymeric	Level A (injury): 180	0.16	0.000097	5	0	5	0	5	0	0.00026	5	0	0.000073	5	0	5	0	5	0	0.00005	5	0	5	0
		Level B (behavioral): 120	1,585	0.8439	5	0	5	0	5	0	0.9746	5	0	0.9247	5	0	5	0	5	0	0.9746	5	0	5	0
	Impact (contingency) Polymeric	Level A (injury): 180	10	0.00618	20	0	20	0	20	0	0.00166	20	0	0.00469	20	0	20	0	20	0	0.00342	20	0	20	0
		Level B (behavioral): 120	46.4	0.02919	20	0	20	0	20	0	0.00786	20	0	0.02427	20	0	20	0	20	0	0.02116	20	0	20	0

Atlantic Spotted Dolphin

Density (#/km^2)	Pile Driving	Threshold (dB re 1 µPa rms)	Distance (m)	Wharf Bravo							South Wall			Wharf Echo							Wharf Foxtrot				
					Pier #1		Pier #2		Pier #3			Pier #1			Pier #1		Pier #2		Pier #3			Pier #1		Pier #2	
				Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)
0.680256	Vibratory Steel	Level A (injury): 180	0.74	0.00045	45	0	45	0	45	0	0.000122	45	0	0.00037	45	0	45	0	45	0	0.000233	45	0	45	0
		Level B (behavioral): 120	7,356	2.96	45	90	45	90	45	90	2.96	45	90	2.96	45	90	45	90	45	90	2.96	45	90	45	90
	Impact (contingency) Steel	Level A (injury): 180	39.8	0.02502	20	0	20	0	20	0	0.0067	20	0	0.02043	20	0	20	0	20	0	0.0173	20	0	20	0
		Level B (behavioral): 160	858	0.5868	20	0	20	0	20	0	0.4724	20	0	0.7562	20	20	20	20	20	20	0.8402	20	20	20	20
	Vibratory Polymeric	Level A (injury): 180	0.16	0.000097	5	0	5	0	5	0	0.00026	5	0	0.000073	5	0	5	0	5	0	0.00005	5	0	5	0
		Level B (behavioral): 120	1,585	0.8439	5	5	5	5	5	5	0.9746	5	5	0.9247	5	5	5	5	5	5	0.9746	5	5	5	5
	Impact (contingency) Polymeric	Level A (injury): 180	10	0.00618	20	0	20	0	20	0	0.00166	20	0	0.00469	20	0	20	0	20	0	0.00342	20	0	20	0
		Level B (behavioral): 120	46.4	0.02919	20	0	20	0	20	0	0.00786	20	0	0.02427	20	0	20	0	20	0	0.02116	20	0	20	0

Bottlenose Dolphin (Winter/Spring Estimates)

Density (#/km^2)	Pile Driving	Threshold (dB re 1 µPa rms)	Distance (m)	Wharf Bravo							South Wall			Wharf Echo							Wharf Foxtrot				
					Pier #1		Pier #2		Pier #3			Pier #1			Pier #1		Pier #2		Pier #3			Pier #1		Pier #2	
				Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)
3.216	Vibratory Steel	Level A (injury): 180	0.74	0.00045	45	0	45	0	45	0	0.000122	45	0	0.00037	45	0	45	0	45	0	0.000233	45	0	45	0
		Level B (behavioral): 120	7,356	2.96	45	450	45	450	45	450	2.96	45	450	2.96	45	450	45	450	45	450	2.96	45	450	45	450
	Impact (contingency) Steel	Level A (injury): 180	39.8	0.02502	20	0	20	0	20	0	0.0067	20	0	0.02043	20	0	20	0	20	0	0.0173	20	0	20	0
		Level B (behavioral): 160	858	0.5868	20	40	20	40	20	40	0.4724	20	40	0.7562	20	40	20	40	20	40	0.8402	20	60	20	60
	Vibratory Polymeric	Level A (injury): 180	0.16	0.000097	5	0	5	0	5	0	0.00026	5	0	0.000073	5	0	5	0	5	0	0.00005	5	0	5	0
		Level B (behavioral): 120	1,585	0.8439	5	15	5	15	5	15	0.9746	5	15	0.9247	5	15	5	15	5	15	0.9746	5	15	5	15
	Impact (contingency) Polymeric	Level A (injury): 180	10	0.00618	20	0	20	0	20	0	0.00166	20	0	0.00469	20	0	20	0	20	0	0.00342	20	0	20	0
		Level B (behavioral): 120	46.4	0.02919	20	0	20	0	20	0	0.00786	20	0	0.02427	20	0	20	0	20	0	0.02116	20	0	20	0

Bottlenose Dolphin (Summer/Fall Estimates)

Density (#/km^2)	Pile Driving	Threshold (dB re 1 µPa rms)	Distance (m)	Wharf Bravo							South Wall			Wharf Echo							Wharf Foxtrot				
					Pier #1		Pier #2		Pier #3			Pier #1			Pier #1		Pier #2		Pier #3			Pier #1		Pier #2	
				Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)	Days (#)	Takes (#)	Area (km2)	Days (#)	Takes (#)	Days (#)	Takes (#)
8.076	Vibratory Steel	Level A (injury): 180	0.74	0.00045	45	0	45	0	45	0	0.000122	45	0	0.00037	45	0	45	0	45	0	0.000233	45	0	45	0
		Level B (behavioral): 120	7,356	2.96	45	1080	45	1080	45	1080	2.96	45	1080	2.96	45	1080	45	1080	45	1080	2.96	45	1080	45	1080
	Impact (contingency) Steel	Level A (injury): 180	39.8	0.02502	20	0	20	0	20	0	0.0067	20	0	0.02043	20	0	20	0	20	0	0.0173	20	0	20	0
		Level B (behavioral): 160	858	0.5868	20	100	20	100	20	100	0.4724	20	80	0.7562	20	120	20	120	20	120	0.8402	20	140	20	140
	Vibratory Polymeric	Level A (injury): 180	0.16	0.000097	5	0	5	0	5	0	0.00026	5	0	0.000073	5	0	5	0	5	0	0.00005	5	0	5	0
		Level B (behavioral): 120	1,585	0.8439	5	35	5	35	5	35	0.9746	5	40	0.9247	5	35	5	35	5	35	0.9746	5	40	5	40
	Impact (contingency) Polymeric	Level A (injury): 180	10	0.00618	20	0	20	0	20	0	0.00166	20	0	0.00469	20	0	20	0	20	0	0.00342	20	0	20	0
		Level B (behavioral): 120	46.4	0.02919	20	0	20	0	20	0	0.00786	20	0	0.02427	20	0	20	0	20	0	0.02116	20	0	20	0

Return to SUMMARY

Appendix D

Acoustic Criteria Spreadsheets Used to Calculate PTS ZOIs

A: STATIONARY SOURCE: Non-Impulsive, Continuous

KEY	
	Action Proponent Provided Information
	NMFS Provided Information (Acoustic Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bravo Wharf Phase II
PROJECT/SOURCE INFORMATION	Bravo 2 consists of 292 pairs. 60% will be driven by March 12, 2018. This is for the remaining 40%: 117 pairs (234 individual piles). 12 pairs per day (from IHA section 6.10) at 1 min per pair (U.S. Navy 2017) = 12 minutes/60 = 0.2 hours
Please include any assumptions	
PROJECT CONTACT	

STEP 2: WEIGHTING FACTOR ADJUSTMENT — Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value

Weighting Factor Adjustment¥	2.5	default value for vibratory pile driving
¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab		
		† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 43), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

*** BROADBAND Sources: Cannot use WFA higher than maximum applicable frequency (See GRAY tab for more information on WFA applicable frequencies)**

STEP 3: SOURCE-SPECIFIC INFORMATION

Source Level (RMS SPL)	156
Activity Duration (hours) within 24-h period	0.2
Activity Duration (seconds)	720
10 Log (duration)	28.57
Propagation (xLogR)	15
Distance of source level measurement (meters)	10

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	199	198	173	201	219
PTS Isopleth to threshold (meters)	**1.1**	**0.1**	**1.6**	**0.7**	**0.0**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (dB)†	**-0.05**	**-16.83**	**-23.50**	**-1.29**	**-0.60**

E.1: IMPACT PILE DRIVING (STATIONARY SOURCE: Impulsive, Intermittent)

KEY	
	Action Proponent Provided Information
	NMFS Provided Information (Acoustic Guidance)
	Resultant Isopleth

STEP 1: GENERAL PROJECT INFORMATION

PROJECT TITLE	Bravo Wharf Phase II
PROJECT/SOURCE INFORMATION	The IHA report stated 20 strikes per day, so I included one pile per day with 20 strikes per pile
Please include any assumptions	
PROJECT CONTACT	

STEP 2: WEIGHTING FACTOR ADJUSTMENT Specify if relying on source-specific WFA, alternative weighting/dB adjustment, or if using default value

Weighting Factor Adjustment¥	2	Default value for Impact Pile Driving

¥ Broadband: 95% frequency contour percentile (kHz) OR Narrowband: frequency (kHz); For appropriate default WFA: See INTRODUCTION tab

† If a user relies on alternative weighting/dB adjustment rather than relying upon the WFA (source-specific or default), they may override the Adjustment (dB) (row 64), and enter the new value directly. However, they must provide additional support and documentation supporting this modification.

*** BROADBAND Sources: Cannot use WFA higher than maximum applicable frequency (See GRAY tab for more information on WFA applicable frequencies)**

STEP 3: SOURCE-SPECIFIC INFORMATION

NOTE: Choose either E1-1 OR E.1-2 method to calculate isopleths (not required to fill in sage boxes for both)

E.1-1: METHOD USING RMS SPL SOURCE LEVEL

Source Level (RMS SPL)	190
Activity Duration (h) within 24-h period OR Number of piles per day	1
Pulse Duration$^{\Delta}$ (seconds)	1
Number of strikes in 1 h OR Number of strikes per pile	20
Activity Duration (seconds)	20
10 Log (duration)	13.01
Propagation (xLogR)	15
Distance of source level measurement (meters)	10

$^{\Delta}$Window that makes up 90% of total cumulative energy (5%-95%) based on Madsen 2005

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS Isopleth to threshold (meters)	**215.5**	**7.7**	**256.7**	**115.3**	**8.4**

E.1-2: ALTERNATIVE METHOD (SINGLE STRIKE EQUIVALENT)

SEL_{cum} = SEL_{ss} + 10 Log (# strikes)	**#NUM!**

Source Level (Single Strike/shot SEL)	
Number of strikes in 1 h OR Number of strikes per pile	
Activity Duration (h) within 24-h period OR Number of piles per day	
Propagation (xLogR)	
Distance of single strike SEL measurement (meters)	

RESULTANT ISOPLETHS

Hearing Group	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
SEL_{cum} Threshold	183	185	155	185	203
PTS Isopleth to threshold (meters)	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**	**#NUM!**

WEIGHTING FUNCTION CALCULATIONS

Weighting Function Parameters	Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
a	1	1.6	1.8	1	2
b	2	2	2	2	2
f_1	0.2	8.8	12	1.9	0.94
f_2	19	110	140	30	25
C	0.13	1.2	1.36	0.75	0.64
Adjustment (dB)†	**-0.01**	**-19.74**	**-26.87**	**-2.08**	**-1.15**