

APPENDIX D

SUMMARY OF ACOUSTIC MODELING RESULTS

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D SUMMARY OF ACOUSTIC MODELING RESULTS

When analyzing the results of the acoustic effect modeling to provide an estimate of harassment, it is important to understand that there are limitations to the ecological data used in the model, and to interpret the model results within the context of a given species' ecology.

It is also important to understand that the estimates of marine mammal sound exposures are presented **without** consideration of mitigation. The Navy will work through the ESA consultation process to evaluate the mitigation measures to reduce the potential for incidental harassment to ESA-listed species (see Chapter 6). Based on the ongoing consultation and the consideration of mitigation with NMFS, the Navy would request authorization under MMPA and ESA for any listed species where NMFS concludes that incidental harassment may occur.

D.1 Summary of Modeling Results Published in 2008 for Site A off the Coast of Northeastern Florida

Table D-1 provides the Site A annual raw acoustic exposure estimates by source, Table D-2 provides the Site A effect estimate by training scenario, and Table D-3 provides the Site A effect estimate by mammal species.

D.2 Summary of Modeling Results Published in 2008 for Site B off the Coast of South Carolina

Table D-4 provides the Site B annual raw acoustic exposure estimates by source, Table D-5 provides the Site B effect estimate by training scenario, and Table D-6 provides the Site B effect estimate by mammal species.

D.3 Summary of Modeling Results Published in 2008 for Site C off the Coast of Southeastern North Carolina

Table D-7 provides the Site C annual raw acoustic exposure estimates by source, Table D-8 provides the Site C effect estimate by training scenario, and Table D-9 provides the Site C effect estimate by mammal species.

D.4 Summary of Modeling Results Published in 2008 for Site D off the Coast of Northeastern Virginia

Table D-10 provides the Site D annual raw acoustic exposure estimates by source, Table D-11 provides the Site D effect estimate by training scenario, and Table D-12 provides the Site D effect estimate by mammal species.

Table D-1

Site A - MMPA Harassment Estimate Summary by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	6.1	12032.8
SQS-56 Target Mode	0.0	2.0	5978.5
SQS-53 Search Mode	4.8	1471.8	58976.7
SQS-53 Target Mode	0.0	7.2	13004.1
SUB	0.4	12.2	12168.4
Mk 48	0.0	4.2	391.7
ALFS	2.5	193.4	2490.0
DICASS	0.0	2.6	60.7
M k 46/54	0.0	0.7	0.4
ADC Mk 43	0.1	1.2	142.3
NIXIE	0.0	0.0	69.3

Table D-2

Site A - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	2.1	2.8	0.4	2.5
Estimated TTS Exposures (MMPA Level B)	158.9	808.7	14.8	719.1
Estimated Behavioral Exposures (MMPA Level B)	2760.1	48216.1	12659.9	42766.5

Table D-3

Site A - MMPA Harassment Estimate Summary by Marine Mammal
 Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	4.3	747.4	49756.9
Pilot Whales	0.1	23.6	1809.5
Common Dolphin	0.0	0.0	0.0
Risso's Dolphin	0.2	28.8	2554.4
All Beaked Whales	0.0	0.0	28.2
Humpback Whales	0.0	1.8	105.6
Sperm Whales	0.0	0.0	0.0
Spotted Dolphins	2.8	808.2	46558.5
Clymene Dolphin	0.1	28.1	1713.1
Northern Right Whales	0.0	0.5	47.0
Pygmy Dwarf Sperm Whales	0.0	2.7	162.8
Rough Toothed Dolphin	0.0	1.3	77.4
Striped Dolphin	0.0	0.0	0.0
Minke Whale	0.0	0.1	7.4
Pantropical Dolphin	0.2	58.9	3585.8
Fin Whale	0.0	0.0	0.0
Sei Whale	0.0	0.0	0.0

Table D-4

Site B MMPA Harassment Estimate Summary by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	0.7	2116.2
SQS-56 Target Mode	0.0	0.2*	1058.1**
SQS-53 Search Mode	0.0	170.9	3300.6
SQS-53 Target Mode	0.0	0.8	550.2
SUB	0.0	13.7	856.1
MK-48	0.0	0.7	240.1
ALFS	0.0	11.2	539.8
DICASS	0.0	0.3	56.3
Mk 46/54	0.0	0.0	0.1
ADC Mk43	0.1	0.4	0.2
NIXIE	0.0	0.0	18.6

Notes: * value equals 1/3 of estimated TTS exposures for SQS-56 search mode

** value equals 1/2 of estimated behavioral exposures for SQS-56 search mode

Table D-5

Site B - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	0.0	0.0	0.0	0.0
Estimated TTS Exposures (MMPA Level B)	9.5	92.7	14.2	82.5
Estimated Behavioral Exposures (MMPA Level B)	789.7	3370.7	1096.8	2934.5

Table D-6

Site B - MMPA Harassment Estimate Summary by Marine Mammal
Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	0.0	75.8	3298.1
Pilot Whales	0.0	15.4	748.9
Common Dolphin	0.0	0.0	0.0
Risso's Dolphin	0.0	18.6	756.0
All Beaked Whales	0.0	0.0	0.0
Humpback Whales	0.0	0.0	23.0
Sperm Whales	0.0	0.0	0.0
Spotted Dolphins	0.0	0.0	2405.1
Clymene Dolphin	0.0	0.0	296.9
Northern Right Whales	0.0	0.0	4.3
Pygmy Dwarf Sperm Whales	0.0	0.7	28.5
Rough Toothed Dolphin	0.0	0.0	12.5
Striped Dolphin	0.0	0.0	0.0
Minke Whale	0.0	0.0	1.1
Pantropical Dolphin	0.0	0.0	621.2
Fin Whale	0.0	0.0	0.0
Sei Whale	0.0	0.0	0.0

Table D-7

Site C - Acoustic Effect Analysis Output by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	2.2	2273.6
SQS-56 Target Mode	0.0	0.7	1209.3
SQS-53 Search Mode	1.8	608.7	13600.1
SQS-53 Target Mode	0.0	2.6	2680.4
SUB	0.2	10.5	18025.6
MK-48	0.0	2.3	186.2
ALFS	0.0	17.3	3535.3
DICASS	0.0	0.9	105.6
MK 54	0.0	0.0	0.0
Mk 46	0.0	0.3	0.2
ADC Mk43	0.5	0.6	80.8
NIXIE	0.0	0.0	24.6

Table D-8

Site C - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	0.0	0.9	0.2	0.8
Estimated TTS Exposures (MMPA Level B)	14.9	327.9	11.9	291.5
Estimated Behavioral Exposures (MMPA Level B)	3326.6	10993.4	18275.5	9724.8

Table D-9

Site C - MMPA Harassment Estimate Summary by Marine Mammal
 Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	0.9	239.8	21861.2
Pilot Whales	0.0	2.9	539.1
Common Dolphin	0.0	0.0	1.2
Risso's Dolphin	0.0	5.6	348.7
All Beaked Whales	0.0	0.0	3.1
Humpback Whales	0.0	0.0	0.0
Sperm Whales	0.0	0.0	0.0
Spotted Dolphins	0.8	304.3	14050.0
Clymene Dolphin	0.1	28.9	1704.1
Northern Right Whales	0.0	0.0	3.5
Pygmy Dwarf Sperm Whales	0.0	2.7	161.9
Rough Toothed Dolphin	0.0	1.3	76.9
Striped Dolphin	0.0	0.0	0.0
Minke Whale	0.0	0.1	7.6
Pantropical Dolphin	0.2	60.5	3567.0
Fin Whale	0.0	0.0	0.0
Sei Whale	0.0	0.0	0.0

Table D-10

Site D - Acoustic Effect Analysis Output by Source
Total annual number of estimated exposures of all species

Source	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
SQS-56 Search Mode	0.0	11.0	11430.2
SQS-56 Target Mode	0.0	3.7	5702.2
SQS-53 Search Mode	9.4	3570.1	64215.7
SQS-53 Target Mode	0.0	14.1	9113.1
SUB	1.0	79.7	45124.3
MK-48	0.0	15.3	1317.7
ALFS	0.0	62.7	10512.7
DICASS	0.0	4.9	363.4
MK 54	0.0	0.0	0.0
Mk 46	0.0	1.2	1.0
ADC Mk43	0.2	2.0	230.9
NIXIE	0.0	0.0	108.3

Table D-11

Site D - MMPA Harassment Summary by Scenario
Total annual number of estimated exposures of all species

	Scenario 1 Estimated MMPA Harassments	Scenario 2 Estimated MMPA Harassments	Scenario 3 Estimated MMPA Harassments	Scenario 4 Estimated MMPA Harassments
Estimated PTS Exposures (MMPA Level A)	0.1	5.0	1.0	4.5
Estimated TTS Exposures (MMPA Level B)	55.2	1915.1	88.5	1702.1
Estimated Behavioral Exposures (MMPA Level B)	10617.9	49869.3	46526.6	44035.2

Table D-12

Site D - MMPA Harassment Estimate Summary by Marine Mammal
Total annual number of estimated exposures of all species

Species	Estimated PTS Exposures (MMPA Level A)	Estimated TTS Exposures (MMPA Level B)	Estimated Behavioral Exposures (MMPA Level B)
Bottlenose Dolphin	0.2	80.1	6640.1
Pilot Whales	0.1	31.3	3632.1
Common Dolphin	9.2	3329.0	119211.6
Risso's Dolphin	0.2	46.1	2243.3
All Beaked Whales	0.0	0.5	127.6
Humpback Whales	0.0	0.0	0.0
Sperm Whales	0.0	1.1	268.2
Spotted Dolphins	0.0	0.7	80.3
Clymene Dolphin	0.1	31.6	1421.2
Northern Right Whales	0.0	0.4	15.5
Pygmy Dwarf Sperm Whales	0.0	3.0	135.0
Rough Toothed Dolphin	0.0	1.4	64.2
Striped Dolphin	0.6	167.5	14148.4
Minke Whale	0.0	0.1	6.2
Pantropical Dolphin	0.2	66.2	2974.7
Fin Whale	0.0	1.8	84.6
Sei Whale	0.0	0.0	0.0