

## FOREWORD

The Draft Atlantic Fleet Training and Testing (AFTT) Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) was released for public review and comment 30 June 2017 through 29 August 2017. Changes in this Final EIS/OEIS reflect responses to all substantive comments made on the Draft EIS/OEIS during the public comment period as well as Navy refinements to the Proposed Action. Additionally, the analysis has been refined to more accurately quantify the expected acoustic effects on marine mammals, taking into consideration animal avoidance or movement and Navy mitigation measures. Public comments are summarized, and the responses to them are included in Appendix H, Public Comments and Responses.

While most sections in the EIS/OEIS were changed in some manner between the draft and final versions, many of those changes entailed minor modifications to improve clarity. The key changes between the AFTT Draft EIS/OEIS and Final EIS/OEIS follow.

- Chapter 1 (Purpose and Need and Alternatives) and Chapter 2 (Description of Proposed Action and Alternatives):  
Reiterated that from the outset of this EIS/OEIS Navy and National Marine Fisheries Service (NMFS) have worked closely together, with an appreciation of each agency's respective purpose and need. Included additional clarifying language further articulating NMFS' distinct purpose and need, as well as further explaining their role in the development of mitigation measures that shaped the Action Alternatives.
- Chapter 2 (Description of Proposed Action and Alternatives):  
Annual levels of certain activities and resulting quantities of associated military expended materials and stressors were adjusted to reflect more accurate estimates of future training and testing needs and to correct errors. The general types and locations of training and testing did not change.

Some of these changes affected the modeled marine mammal exposure results, such that some modeled exposures changed for both training and testing activities. Reduction of Undersea Warfare Testing Activities in the Northeast Range Complex reduced potential impacts from sonar and other transducers to Endangered Species Act (ESA)-listed whales and harbor porpoises. Modeled impacts (primarily behavioral response) increased overall for training with sonar and other transducers. For training activities with explosives, total estimated impacts decreased slightly for many species, especially behavioral impacts. Estimated impacts increased slightly for testing activities that use explosive for most species groups except mysticetes, which decreased slightly. Acoustic impacts from other sound sources such as air gun and pile driving remained unchanged from the Draft EIS/OEIS. Additionally, a few minor errors were identified and corrected. The updated exposure numbers are presented in Appendix E (Acoustic Impact Tables).

- Section 3.0 (Introduction to Affected Environment and Environmental Consequences):  
Tables were updated to reflect different annual levels of certain activities and resulting quantities of associated military expended materials and other non-acoustic and explosive stressors based on changes to Chapter 2 (Description of Proposed Action and Alternatives). Changes in the number of activities proposed also prompted updates to the tables describing the level of use of acoustic sources.

Tables 1 through 8 identify the changes between the Draft EIS/OEIS and this Final EIS/OEIS for sonar and explosive usage during training and testing by alternative. Some of these changes affected the modeled marine mammal exposure results as described above in the Chapter 2 summary. Proposed sonar and other transducers remained mostly consistent between the Draft and Final EIS/OEISs, with minor exceptions shown in Table 1 and Table 2. The number of hours in the low-frequency (LF) 5 bin for training increased between the Draft EIS/OEIS and the Final EIS/OEIS because this sound source was added to the Submarine Sonar Maintenance activity in the Final EIS/OEIS. The amount of mid-frequency (MF) 3 sonar for both training and testing changed between the Draft EIS/OEIS and the Final EIS/OEIS because of the way this bin is reported. In the Draft EIS/OEIS the MF3 bin was reported as a count. However, to be more accurate, for the Final EIS/OEIS, the bin MF3 was converted into hours. Therefore, the overall amount of sonar in this bin did not change, however how the sonar is reported did change. The number of hours in the MF10 bin for training increased because this sonar bin was added to the Maritime Security Operations activity to support improvements on how this activity is conducted. The torpedoes (TORP) 3 bin for testing was added for the FEIS/OEIS due to a new requirement in the testing community that did not exist during the DEIS/OEIS.

Proposed explosives use also remained mostly consistent between the Draft EIS/OEIS and this Final EIS/OEIS. Exceptions are noted in Table 3 and Table 4.

**Table 1: Change in Annual Sonar and Other Transducers Usage during Training Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS**

<i>For Annual Training Activities</i>								
<i>Source Class Category</i>	<i>Bin</i>	<i>Unit<sup>1</sup></i>	<i>Annual Usage<sup>2</sup></i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
<b>Low-Frequency (LF):</b> Sources that produce signals less than 1 kHz	LF3	H	0	0	–	0	0	–
	LF4	H	0	0	–	0	0	–
		C	0	0	–	0	0	–
	LF5	H	0	9	+9	0	9	+9
	LF6	H	145–175	145–175	–	204	204	–
<b>Mid-Frequency (MF):</b> Tactical and non-tactical sources that produce signals between 1 and 10 kHz	MF1	H	5,005–5,605	5,005–5,605	–	7,081	7,081	–
	MF1K	H	117	117	–	117	117	–
	MF3	H	49,188–49,227	2,078–2,097	-47,130 <sup>3,4</sup>	49,265	2,116	-47,149 <sup>4</sup>
	MF4	H	591–611	591–611	–	630	630	–
	MF5	C	6,708–6,836	6,708–6,836	–	6,964	6,964	–
	MF6	C	0	0	–	0	0	–
	MF8	H	0	0	–	0	0	–
	MF9	H	0	0	–	0	0	–
	MF10	H	0	870	+870	0	870	+870
	MF11	H	873–1,001	873–1,001	–	1,399	1,399	–
	MF12	H	367–397	367–397	–	596	596	–
	MF14	H	0	0	–	0	0	–
	<b>High-Frequency (HF):</b> Tactical and non-tactical sources that produce signals between 10 and 100 kHz	HF1	H	1,928–1,932	1,928–1,932	–	1,935	1,935
HF3		H	0	0	–	0	0	–
HF4		H	5,411–6,371	5,411–6,371	–	6,371	6,371	–
HF5		H	0	0	–	0	0	–
		C	0	0	–	0	0	–

**Table 1: Change in Annual Sonar and Other Transducers Usage during Training Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS (continued)**

<i>For Annual Training Activities</i>								
<i>Source Class Category</i>	<i>Bin</i>	<i>Unit<sup>1</sup></i>	<i>Annual Usage<sup>2</sup></i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
<b>High-Frequency (HF):</b> Tactical and non-tactical sources that produce signals between 10 and 100 kHz (continued)	HF6	H	0	0	–	0	0	–
	HF7	H	0	0	–	0	0	–
	HF8	H	20	20	–	20	20	–
<b>Very High Frequency Sonars (VHF):</b> Non-tactical sources that produce signals between 100 and 200 kHz	VHF1	H	0	0	–	0	0	–
<b>Anti-Submarine Warfare (ASW):</b> Tactical sources (e.g., active sonobuoys and acoustic countermeasures systems) used during ASW training and testing activities	ASW1	H	582–641	582–641	–	1,040	1,040	–
	ASW2	C	1,476–1,556	1,476–1,556	–	1,636	1,636	–
	ASW3	H	4,485–5,445	4,485–5,445	–	6,690	6,690	–
	ASW4	C	426–432	425–431	-1 <sup>3</sup>	438	437	-1
	ASW5 <sup>5</sup>	H	572–652	572–652	–	732	732	–
<b>Torpedoes (TORP):</b> Source classes associated with the active acoustic signals produced by torpedoes	TORP1	C	57	57	–	57	57	–
	TORP2	C	80	80	–	80	80	–
	TORP3	C	0	0	–	0	0	–
<b>Forward Looking Sonar (FLS):</b> Forward or upward looking object avoidance sonars used for ship navigation and safety	FLS2	H	0	0	–	0	0	–
<b>Acoustic Modems (M):</b> Systems used to transmit data through the water	M3	H	0	0	–	0	0	–

**Table 1: Change in Annual Sonar and Other Transducers Usage during Training Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS (continued)**

<i>For Annual Training Activities</i>								
<i>Source Class Category</i>	<i>Bin</i>	<i>Unit<sup>1</sup></i>	<i>Annual Usage<sup>2</sup></i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
<b>Swimmer Detection Sonars (SD):</b> Systems used to detect divers and submerged <i>swimmers</i>	SD1–SD2	H	0	0	–	0	0	–
<b>Synthetic Aperture Sonars (SAS):</b> Sonars in which active acoustic signals are post-processed to form high-resolution images of the seafloor	SAS1	H	0	0	–	0	0	–
	SAS2	H	0–8,400	0–8,400	–	8,400	8,400	–
	SAS3	H	0	0	–	0	0	–
	SAS4	H	0	0	–	0	0	–
<b>Broadband Sound Sources (BB):</b> Sonar systems with large frequency spectra, used for various purposes	BB1	H	0	0	–	0	0	–
	BB2	H	0	0	–	0	0	–
	BB4	H	0	0	–	0	0	–
	BB5	H	0	0	–	0	0	–
	BB6	H	0	0	–	0	0	–
	BB7	C	0	0	–	0	0	–

<sup>1</sup>H = hours; C = count (e.g., number of individual pings or individual sonobuoys).

<sup>2</sup>Expected annual use may vary per bin because the number of events may vary from year to year, as described in Chapter 2, Description of Proposed Action and Alternatives.

<sup>3</sup>Where a range of values is given, the maximum values are compared.

<sup>4</sup>Change due to updated units for this bin between Draft and Final. Draft reported in count (C) and Final reported in hours (H).

<sup>5</sup>Formerly ASW2 (H) in Phase II.

**Table 2: Change in Annual Sonar and Other Transducers Usage during Testing Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS**

<i>For Annual Testing Activities</i>								
<i>Source Class Category</i>	<i>Bin</i>	<i>Unit<sup>1</sup></i>	<i>Annual Usage<sup>2</sup></i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
<b>Low-Frequency (LF):</b> Sources that produce signals less than 1 kHz	LF3	H	1,308	1,308	–	1,308	1,308	–
	LF4	H	971	971	–	971	971	–
		C	20	20	–	20	20	–
	LF5	H	1,752	1,752	–	1,752	1,752	–
	LF6	H	40	40	–	40	40	–
<b>Mid-Frequency (MF):</b> Tactical and non-tactical sources that produce signals between 1 and 10 kHz	MF1	H	3,337	3,337	–	3,337	3,337	–
	MF1K	H	152	152	–	152	152	–
	MF3	H	12,291	1,257	-11,034 <sup>4</sup>	12,291	1,257	-11,034 <sup>4</sup>
	MF4	H	370–803	370–803	–	803	761-803	– <sup>3</sup>
	MF5	C	5,070–6,182	5,070–6,182	–	6,382	6,382	–
	MF6	C	1,256–1,341	1,256–1,341	–	1,391	1,391	–
	MF8	H	348	348	–	348	348	–
	MF9	H	7,394–7,561	7,395–7,562		7,561	7,561	–
	MF10	H	5,690	5,690	–	5,690	5,690	–
	MF11	H	1,424	1,424	–	1,424	1,424	–
	MF12	H	1,388	1,388	–	1,388	1,388	–
	MF14	H	1,440	1,440	–	1,440	1,440	–

**Table 2: Change in Annual Sonar and Other Transducers Usage during Testing Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS (continued)**

<i>For Annual Testing Activities</i>								
<i>Source Class Category</i>	<i>Bin</i>	<i>Unit<sup>1</sup></i>	<i>Annual Usage<sup>2</sup></i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
<b>High-Frequency (HF):</b> Tactical and non-tactical sources that produce signals between 10 and 100 kHz	HF1	H	397	397	–	397	397	–
	HF3	H	31	31	–	31	31	–
	HF4	H	30,772–30,828	30,772–30,828	–	30,828	30,828	–
	HF5	H	1,864–2,056	1,864–2,056	–	2,056	2,056	–
		C	40	40	–	40	40	–
<b>High-Frequency (HF):</b> Tactical and non-tactical sources that produce signals between 10 and 100 kHz	HF6	H	2,193	2,193	–	2,193	2,193	–
	HF7	H	1,224	1,224	–	1,224	1,224	–
	HF8	H	2,084	2,084	–	2,084	2,084	–
<b>Very High Frequency Sonars (VHF):</b> Non-tactical sources that produce signals between 100 and 200 kHz	VHF1	H	12	12	–	12	12	–
<b>Anti-Submarine Warfare (ASW):</b> Tactical sources (e.g., active sonobuoys and acoustic countermeasures systems) used during ASW training and testing activities	ASW1	H	820	820	–	820	820	–
	ASW2	C	4,756–5,606	4,756–5,606	–	6,106	6,106	–
	ASW3	H	2,941–3,325	2,941–3,325	–	3,325	3,325	–
	ASW4	C	3,493	3,493	–	3,493	3,493	–
	ASW5 <sup>5</sup>	H	608–628	608–628	–	708	708	–
<b>Torpedoes (TORP):</b> Source classes associated with the active acoustic signals produced by torpedoes	TORP1	C	806–980	806–980	–	980	980	–
	TORP2	C	344–408	344–408	–	408	408	–
	TORP3	C	0	100	+100	0	100	+100

**Table 2: Change in Annual Sonar and Other Transducers Usage during Testing Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS (continued)**

<i>For Annual Testing Activities</i>								
<i>Source Class Category</i>	<i>Bin</i>	<i>Unit<sup>1</sup></i>	<i>Annual Usage<sup>2</sup></i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
<b>Forward Looking Sonar (FLS):</b> Forward or upward looking object avoidance sonars used for ship navigation and safety	FLS2	H	1,224	1,224	–	1,224	1,224	–
<b>Acoustic Modems (M):</b> Systems used to transmit data through the water	M3	H	634	634	–	634	634	–
<b>Swimmer Detection Sonars (SD):</b> Systems used to detect divers and submerged <i>swimmers</i>	SD1–SD2	H	176	176	–	176	176	–
<b>Synthetic Aperture Sonars (SAS):</b> Sonars in which active acoustic signals are post-processed to form high-resolution images of the seafloor	SAS1	H	960	960	–	960	960	–
	SAS2	H	3,512	3,512	–	3,512	3,512	–
	SAS3	H	960	960	–	960	960	–
	SAS4	H	960	960	–	960	960	–
<b>Broadband Sound Sources (BB):</b> Sonar systems with large frequency spectra, used for various purposes	BB1	H	960	960	–	960	960	–
	BB2	H	960	960	–	960	960	–
	BB4	H	876–3,252	876–3,252	–	3,252	3,252	–
	BB5	H	672	672	–	672	672	–
	BB6	H	672	672	–	672	672	–
	BB7	C	120	120	–	120	120	–

<sup>1</sup>H = hours; C = count (e.g., number of individual pings or individual sonobuoys).

<sup>2</sup>Expected annual use may vary per bin because the number of events may vary from year to year, as described in Chapter 2, Description of Proposed Action and Alternatives.

<sup>4</sup>Change due to updated units for this bin between Draft and Final. Draft reported in count (C) and Final reported in hours (H).

<sup>5</sup>Formerly ASW2 (H) in Phase II.



**Table 3: Change in Annual Explosive Usage during Training Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS**

<i>For Annual Training Activities</i>								
<i>Bin</i>	<i>Net Explosive Weight<sup>1</sup> (lb.)</i>	<i>Example Explosive Source</i>	<i>Annual<sup>2</sup> Usage</i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
E1	0.1–0.25	Medium-caliber projectile	10,340	7,700	-2,640	10,340	7,700	-2,640
E2	> 0.25–0.5	Medium-caliber projectile	210–214	210–214	–	214	214	–
E3	> 0.5–2.5	Large-caliber projectile	3,286	4,592	+1,306	3,286	4,592	+1,306
E4	> 2.5–5	Mine neutralization charge	127–133	127–133	–	133	133	–
E5	> 5–10	5 in. projectile	4,140	1,436	-2,704	4,140	1,436	-2,704
E6	> 10–20	Hellfire missile	602	602	–	602	602	–
E7	> 20–60	Demo block/ shaped charge	4	4	–	4	4	–
E8	> 60–100	Lightweight torpedo	48	22	-26	48	22	-26
E9	> 100–250	500 lb. bomb	66	66	–	66	66	–
E10	> 250–500	Harpoon missile	90	90	–	90	90	–
E11	> 500–650	650 lb. mine	1	1	–	1	1	–
E12	> 650–1,000	2,000 lb. bomb	18	18	–	18	18	–
E14 <sup>3</sup>	> 1,741–3,625	Line charge	0	0	–	0	0	–
E16 <sup>4</sup>	> 7,250–14,500	Littoral Combat Ship full ship shock trial	0	0	–	0	0	–
E17 <sup>4</sup>	> 14,500–58,000	Aircraft carrier full ship shock trial	0	0	–	0	0	–

<sup>1</sup> Net Explosive Weight refers to the equivalent amount of trinitrotoluene (TNT) the actual weight of a munition may be larger due to other components.

<sup>2</sup> Expected annual use may vary per bin because the number of events may vary from year to year, as described in Chapter 2, Description of Proposed Action and Alternatives.

<sup>3</sup> E14 is not modeled for protected species impacts in water because most energy is lost into the air or to the bottom substrate due to detonation in very shallow water.

<sup>4</sup> Shock trials consist of four explosions each. In any given year there could be 0-3 small ship shock trials (E16) and 0-1 large ship shock trials (E17). Over a 5-year period, there could be three small ship shock trials (E16) and one large ship shock trial (E17).

**Table 4: Change in Annual Explosive Usage during Testing Activities Analyzed in this Final EIS/OEIS Compared to the Draft EIS/OEIS**

<i>For Annual Testing Activities</i>								
<i>Bin</i>	<i>Net Explosive Weight<sup>1</sup> (lb.)</i>	<i>Example Explosive Source</i>	<i>Annual<sup>2</sup> Usage</i>					
			<i>Alternative 1</i>			<i>Alternative 2</i>		
			<i>Draft</i>	<i>Final</i>	<i>Change</i>	<i>Draft</i>	<i>Final</i>	<i>Change</i>
E1	0.1–0.25	Medium-caliber projectile	17,840–26,840	17,840–26,840	–	26,840	26,840	–
E2	> 0.25–0.5	Medium-caliber projectile	0	0	–	0	0	–
E3	> 0.5–2.5	Large-caliber projectile	2,814–3,182	3,054–3,422	+240 <sup>5</sup>	3,182	3,422	+240
E4	> 2.5–5	Mine neutralization charge	746–800	746–800	–	810	810	–
E5	> 5–10	5 in. projectile	1,325	1,325	–	1,325	1,325	–
E6	> 10–20	Hellfire missile	28–48	28–48	–	48	48	–
E7	> 20–60	Demo block/ shaped charge	0	0	–	0	0	–
E8	> 60–100	Lightweight torpedo	33	33	–	33	33	–
E9	> 100–250	500 lb. bomb	4	4	–	4	4	–
E10	> 250–500	Harpoon missile	68–98	68–98	–	98	98	–
E11	> 500–650	650 lb. mine	10	10	–	20	20	–
E12	> 650–1,000	2,000 lb. bomb	0	0	–	0	0	–
E14 <sup>3</sup>	> 1,741–3,625	Line charge	4	4	–	4	4	–
E16 <sup>4</sup>	> 7,250–14,500	Littoral Combat Ship full ship shock trial	0–12	0–12	–	0–12	0–12	–
E17 <sup>4</sup>	> 14,500–58,000	Aircraft carrier full ship shock trial	0–4	0–4	–	0–4	0–4	–

<sup>1</sup> Net Explosive Weight refers to the equivalent amount of trinitrotoluene (TNT) the actual weight of a munition may be larger due to other components.

<sup>2</sup> Expected annual use may vary per bin because the number of events may vary from year to year, as described in Chapter 2, Description of Proposed Action and Alternatives.

<sup>3</sup> E14 is not modeled for protected species impacts in water because most energy is lost into the air or to the bottom substrate due to detonation in very shallow water.

<sup>4</sup> Shock trials consist of four explosions each. In any given year there could be 0-3 small ship shock trials (E16) and 0-1 large ship shock trials (E17). Over a 5-year period, there could be three small ship shock trials (E16) and one large ship shock trial (E17).

<sup>5</sup> Where a range of values is given, the maximum values are compared.

- Section 3.1 (Air Quality):  
Changes were made to the General Conformity Rule Evaluation section clarifying total direct and indirect emissions and emissions from mobile sources as well as more information regarding attainment and National Ambient Air Quality Standards was added. The Record of Non-Applicability was signed by the Navy and included in Appendix C.
- Section 3.2 (Sediments and Water Quality):  
Changes were made to the description of sediment class sizes in the Affected Environment section to be consistent with a single, modern classification system. Adjustments to all figures were made to ensure the figures are consistent in labeling and nomenclature with other sections in the Final EIS/OEIS. The remaining changes were minor editorial changes to correct errors in grammar and spelling or to clarify the meaning of a statement or description.
- Section 3.3 (Vegetation):  
Adjustments to all figures were made to ensure the figures are consistent in labeling and nomenclature with other sections in the Final EIS/OEIS. Impacts to bottom habitats were updated as appropriate. Additional description and analysis was provided for tidal emergent marsh vegetation and marine debris impacts. ESA conclusions for Johnson’s seagrass were updated to “no effect.” The remaining changes were minor editorial changes to correct errors in grammar and spelling or to clarify the meaning of a statement or description.
- Section 3.4 (Marine Invertebrates):  
The General Background section was updated to include information on the revised estimated number of marine invertebrate species, habitat use, movement and behavior, and threats. Descriptions of sound (particle acceleration) and sediment vibration perception capabilities were updated based on numerous recent studies, and analysis of acoustic impacts on invertebrates was updated accordingly. Descriptions of species listed under the ESA was revised to reflect listing decisions on several coral species and the queen conch (*Lobatus gigas*), as well as changes to common and scientific names. Information on the occurrence of deep-water corals, mesophotic corals, and chemosynthetic communities was added or substantially revised. Overall analyses of impacts on invertebrates were revised based on recent scientific research and changes to the type and number of training and testing activities and expended materials, as described in Chapter 2 (Description of Proposed Action and Alternatives), Section 3.0.3.3 (Identifying Stressors for Analysis), and Appendices A (Navy Activity Descriptions), B (Activity Stressor Matrices), and F (Military Expended Materials and Direct Strike Impact Analyses). Discussion of Essential Fish Habitat was removed from the invertebrates section, and discussion of hard bottom habitat was moved to the Habitats section (Section 3.0.5).

- Section 3.5 (Marine Habitats):

Changes in quantities of explosives on or near the bottom and military expended materials were adjusted based on changes made to Chapter 2 (Description of Proposed Action and Alternatives) and tables in Section 3.0.5.3 (Identification of Stressors for Analysis). The analyses of impacts on marine habitats as a result of these changes were modified accordingly. Impacts of explosives and military expended materials were assessed based on three types of analyses: (1) a conservative scenario assuming all the impacts occur on a single habitat type in an affected area (in a one year-increment), (2) a more realistic situation in which the impacts are spread proportionally among the habitat types in an affected area (e.g., if hard bottom represents 10 percent of the total habitat within a particular testing or training area or range complex, then 10 percent of the total impact is assumed to occur on hard bottom), and (3) in an increment of 5 years.

In addition, abiotic habitat types were further differentiated in the Navy's Aquatic Habitat Mapping Database as "soft", "intermediate", and "hard" substrate. Soft substrate areas are dominated by mud (including clay and silt) or sand. Hard substrate areas are dominated by rocks or consolidated bedrock. Intermediate substrate areas are dominated by unconsolidated material larger than sand but smaller than rocks (e.g., gravel). Additionally, the habitats database was updated to include recently published data sources including both mapped polygon and point data.

- Section 3.6 (Fishes):

ESA status of various species were updated based on National Marine Fisheries Service (NMFS) Final Rules that were published after the Draft EIS/OEIS. Also, ESA analysis and conclusions were updated to correspond with the results of recent ESA consultations. After the release of the Draft EIS/OEIS, NMFS designated critical habitat for the Atlantic sturgeon. That information has been added to this Final EIS/OEIS.

- Section 3.7 (Marine Mammals):

Marine mammal species listing status, abundance estimates, and general threats discussions were updated based on the most recent stock assessment reports and new literature. The analyses of impacts on marine mammals as a result of changes to annual levels of certain activities, as detailed in Chapter 2 (Description of Proposed Action and Alternatives) and updated information on entanglement stressors described in Section 3.0.5.3 (Identification of Stressors for Analysis) were modified accordingly. The acoustic analysis was revised to more accurately quantify the expected acoustic effects on marine mammals, taking into consideration animal avoidance or movement and procedural mitigation measures. The ship strike probability analysis was revised to address a request from the NMFS that was raised during ESA consultation. Updates to mitigation measures were also included as a result of completing consultations under the Marine Mammal Protection Act (MMPA) and ESA.

- **Section 3.8 (Reptiles):**  
The analyses of impacts to sea turtles and other marine reptiles as a result of changes to annual levels of certain activities, as detailed in Chapter 2 (Description of Proposed Action and Alternatives) and tables in Section 3.0.3.3 (Identifying Stressors for Analysis) were modified accordingly. Additional information and analyses were added to the Final EIS/OEIS regarding training and testing activities in inshore locations. Specifically, more detailed analyses regarding terrapins and crocodilians were added to this section.
- **Section 3.9 (Birds and Bats):**  
Adjustments to all figures were made to ensure the figures are consistent in labeling and nomenclature with other sections in the Final EIS/OEIS. Background information on white-nosed syndrome in northeastern states, closer to the Study Area, was added. ESA conclusions were updated to reflect the Biological Assessment and section 7 consultation package. Additional hearing references were added. Potential for helicopter noise exposure was clarified, and additional information about animal flight altitude was added for assessing acoustic exposures. The remaining changes were minor editorial changes to correct errors in grammar and spelling or to clarify the meaning of a statement or description.
- **Section 3.10 (Cultural Resources):**  
Minor corrections and edits were made, including correcting cross-references to tables in Section 3.0.
- **Section 3.11 (Socioeconomic Resources):**  
Changes were made to the descriptions of offshore wind and hydrokinetic energy development projects to update the status of the projects. Adjustments to all figures were made to ensure the figures are consistent in labeling and nomenclature with other sections in the Final EIS/OEIS. Updates to data on recreational fisheries, commercial fisheries, commercial transportation and shipping, and tourism were made to incorporate the most recent available annual data, such as the amount and value of commercial landings, the volume of goods processed at commercial ports, and the economic contribution of tourism the states' economies.
- **Section 3.12 (Public Health and Safety):**  
Updates and edits were made with regard to the latest regulations and standard operating procedures that benefit public health and safety.
- **Chapter 4 (Cumulative Impacts):**  
Non-substantive changes were made throughout Chapter 4 (Cumulative Impacts) to maintain alignment and consistency with updates to Chapters 1-3 (Purpose and Need, Description of Proposed Action and Alternatives, and Affected Environment and

Environmental Consequences), to reflect the availability of updated data, and to correct minor editorial issues.

Additionally, the past, present, and reasonably foreseeable projects and industry information described in Table 4.2-1 was updated where new information was available, and this new information was incorporated into the cumulative analysis for each resource as warranted. Revisions to military projects in Table 4.2-1 included the update of Eglin Air Force Base Gulf Test and Training Range activities; the addition of the Demolition/ Replacement of Pier 32/ Demolition of Pier 10 at Naval Submarine Base New London, Connecticut; the addition of AFTT Phase II discussion of past and ongoing activities; and a revised discussion of Surveillance Towed Array Sensor System Low Frequency Active Sonar systems to clarify that this activity has never been operated within the project area. Updates to outer continental shelf commercial industries information included discussion of 2017 Executive Order Implementing an America-First Offshore Energy Strategy and May 2017 Department of the Interior Secretary Order 3350 Implementing the America-First Offshore Energy Strategy and addition of marine hydrokinetic power generation as a potential future action. Ocean pollution and ecosystem alteration trends were removed from Table 4.2-1 to create Table 4.2-2 in the Final EIS/OEIS that focuses on the known impacts of each specific stressor.

Minor changes were made with respect to the cumulative effects analysis of specific resources. Discussion of invertebrates, particularly the impact of climate change on corals, was expanded. Additional stressors of power plant entrainment and disease, parasites, and algae were added to marine mammals discussion, and a limited discussion of diamondback terrapin was added to the reptiles discussion. All other changes to the cumulative analysis of specific resources incorporate relevant changes that were made to corresponding resource analyses in Chapter 3 (see bullet list, above).

- Chapter 5 (Mitigation):

Based on its ongoing analysis of the best available science and potential mitigation measures, the Navy determined it would be practical to implement additional mitigation measures to enhance protection of marine mammals (including Bryde's whales and ESA-listed North Atlantic right whales) to the maximum extent practicable. The new mitigation measures are detailed in the Final EIS/OEIS and include: (1) enlarging the Northeast North Atlantic Right Whale Mitigation Area to cover the full extent of the northeast North Atlantic right whale critical habitat, (2) expanding the Gulf of Mexico Planning Awareness Area to cover the full extent of the Bryde's whale small and resident population area that was expanded during the 2016 NMFS status review, (3) developing a new Bryde's Whale Mitigation Area to restrict all explosives except for mine warfare activities in the expanded Bryde's whale small and resident population area, (4) implementing special reporting procedures for the use of active sonar and in-water explosives within the newly developed Southeast North Atlantic Right Whale Critical Habitat Special Reporting Area and Bryde's

- Whale Mitigation Area, and newly expanded Northeast North Atlantic Right Whale Mitigation Area and Southeast North Atlantic Right Whale Mitigation Area, (5) adding a requirement for Navy units conducting training or testing activities in the Jacksonville Operating Area to use Early Warning System North Atlantic right whale sightings data as they plan specific details of events and to assist visual observation of applicable mitigation zones to minimize potential interactions with North Atlantic right whales to the maximum extent practicable, (6) adding seafloor resource mitigation areas for submerged aquatic vegetation, (7) adding a requirement to confer with NMFS if the Navy needs to conduct additional major training exercises in the Gulf of Maine Planning Awareness Mitigation Area or Gulf of Mexico Planning Awareness Mitigation Area, (8) adding a requirement to transmit special notification messages to applicable naval units with information from the North Atlantic right whale Dynamic Management Areas, (9) adding a requirement to survey for marine mammals and ESA-listed species after the completion of explosive activities in the vicinity of where detonations occurred (when practical), (10) requiring additional platforms already participating in explosive activities to support observing for applicable biological resources before, during, and after the activity, (11) adding reporting requirements, such as a requirement to report sea turtle vessel strikes and a monitoring initiative to evaluate the extent to which military expended materials may have impacted ESA-listed corals and designated coral critical habitat in or near the Key West Range Complex, (12) adding a requirement for vessels to operate within specific water depths within the Key West Range Complex to avoid bottom scouring and prop dredging, and (13) adding a mitigation measure to not use explosive sonobuoys, explosive torpedoes, explosive medium-caliber and large-caliber projectiles, explosive missiles and rockets, explosive bombs, explosive mines during mine countermeasure and neutralization activities, and anti-swimmer grenades within 3.2 NM of an estuarine inlet and within 1.6 NM of the shoreline in the Navy Cherry Point Range Complex from March through September to the maximum extent practicable to avoid or reduce potential impacts on sea turtles near nesting beaches during the nesting season and on sandbar sharks in Habitat Areas of Particular Concern.
- Chapter 6 (Regulatory Considerations):  
The summary paragraphs for each National Marine Sanctuary were updated to more clearly state whether or not section 304(d) consultation was required for the Sanctuary and to include the findings from the Sanctuary Resource Statements. Updates were made to the status of the Coastal Zone Management Act Compliance process as well as the Magnuson-Stevens Fishery and Conservation Management Act subsection. To address public comments received, new Marine Protected Areas that border inland waters included in the Proposed Action were added to Table 6.1-2, and a new figure was added to display the Marine Protected Areas around Puerto Rico and the Caribbean.
  - Chapter 7 (List of Preparers):  
Changes were made to update the List of Preparers based on changes in personnel working on the project.

- Chapter 8 (Public Involvement):  
Information regarding the public participation process, related to the release of the Draft EIS/OEIS, public meetings held, and the public comments received on the Draft EIS/OEIS comments were added.
- Appendix A (Navy Activity Descriptions):  
Changes were made to reflect modifications made to Chapter 2 (Description of Proposed Action and Alternatives) and to correct errors.
- Appendix B (Activity Stressor Matrices):  
Changes were made to reflect corrections made to Chapter 2 (Description of Proposed Action and Alternatives), Appendix A (Navy Activity Descriptions), and to correct errors.
- Appendix C (Air Quality Emission Calculations and Record of Non-Applicability):  
The example emissions calculations and Record of Non-Applicability were modified based on changes in numbers of annual events in Chapter 2 (Description of Proposed Action and Alternatives).
- Appendix D (Acoustic and Explosive Impacts):  
No changes have been made since the release of the Draft EIS/OEIS.
- Appendix E (Estimated Marine Mammal and Sea Turtle Impacts from Exposure to Acoustic and Explosive Stressors Under Navy Training and Testing Activities):  
Changes made to the exposure numbers reflected changes made to the sonar hours and counts, explosives, and activity numbers in Chapter 2 (Description of Proposed Action and Alternatives).
- Appendix F (Military Expended Material and Direct Strike Impact Analysis):  
Changes were made to the military expended materials tables and the benthic substrate impact tables to reflect modifications made to activity numbers in Chapter 2 (Description of Proposed Action and Alternatives) and to correct minor errors.
- Appendix G (Federal Register Notices):  
Additional Federal Register Notices since the public release of the Draft EIS/OEIS were added.
- Appendix H (Public Comment Responses):  
This Appendix was added since the release of the Draft EIS/OEIS and includes an explanation of the public comment process for the Draft EIS/OEIS, list of agencies and organizations that provided comments, and a table containing the comments received and the Navy's responses.



- Appendix I (Geographic Information System Data Sources):  
Geographic Information System data features and source information was updated.
- Appendix J (Agency Correspondence):  
Agency correspondence received since the public release of the Draft EIS/OEIS is included.

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