

2019 ANNUAL REPORT ON EGLIN GULF TEST AND TRAINING RANGE (EGTTR) MISSION ACTIVITIES:

PROTECTED SPECIES MONITORING AND MITIGATION RESULTS



PREPARED FOR:
National Marine Fisheries Service
Office of Protected Resources
&
Southeast Regional Office
Protected Resources Division

PREPARED BY:
Department of the Air Force
96 CEG/CEIA
Eglin Natural Resources Office
501 DeLeon Street, Suite 101
Eglin AFB, FL 32542-5133

FEBRUARY 2020
FINAL REPORT

This page is intentionally left blank



PRINTED ON RECYCLED PAPER

TABLE OF CONTENTS

	<u>Page</u>
Executive Summary	1
1. Introduction	2
1.1 Human Safety Procedures	3
1.2 General Mitigation and Monitoring Requirements	3
2. AFSOC – Air-to-Surface (A-S) Gunnery Training	4
2.1 Mission Set-Up.....	5
2.2 Mitigation and Monitoring Requirements.....	5
2.3 Description of AFSOC A-S Gunnery Training Activities	7
2.4 AFSOC Mission Summary.....	7
3. 780 th Test Squadron (780 TS).....	8
3.1 Mission Set-Up.....	9
3.1.1 Hellfire Missions.....	9
3.1.2 Small Diameter Bomb (SDB)-II Mission	9
3.2 Mitigation and Monitoring Requirements.....	10
3.3 Description of 780 TS Tests.....	12
3.3.1 Hellfire Tests.....	12
3.3.2 Small Diameter Bomb (SDB) II Tests	15
3.4 780 TS Mission Summary.....	16
4. 86 th Fighter Weapons Squadron (86 FWS) – Maritime Weapons Systems Evaluation Program (WSEP)	16
4.1 Mission Set-Up.....	17
4.1.1 Targets.....	18
4.1.2 Site Plan and Cameras	18
4.1.3 Human Safety Zone	18
4.2 Mitigation and Monitoring Requirements.....	20
4.3 Description of Maritime WSEP Missions.....	23
4.3.1 <i>Monday 4 November 2019</i>	23
4.3.2 <i>Wednesday 6 November 2019</i>	23
4.4 WSEP Mission Summary.....	24
5. 413 th Flight Test Squadron (413 FLTS)	25
6. Summary of all EGTTTR Mission Activities	25
7. Effectiveness of Mitigation and Monitoring Requirements	26
8. Protected Species Stranding Reports	26
9. Conclusion	28
10. References	29

11. Signatures	30
Appendix A	1

LIST OF TABLES

Table 1-1. Annual Marine Mammal Takes Authorized in the EGTTR LOA.....	2
Table 1-2. Sea Turtle Take Authorizations Included in the ITS of the EGTTR BO	2
Table 2-1. AFSOC Gunnery Training Categorized as Representative Mission Days.....	5
Table 2-2. Monitoring Area Radii for Gunnery Missions	6
Table 2-3. Distance in meters to NMFS Harassment Thresholds for Marine Mammals	6
Table 2-4. Distance in meters to NMFS Acoustic Thresholds for Sea Turtles.....	6
Table 2-5. Summary of Air-To-Surface Gunnery Missions for 2019	7
Table 2-6. Comparison of Permitted vs. Actual Level of A-S Gunnery Mission Activities	8
Table 3-1. 780 TS Weapons Testing Categorized as Representative Mission Days	10
Table 3-2. Distance in meters to NMFS Harassment Thresholds for Marine Mammals	11
Table 3-3. Distance in Meters to NMFS Acoustic Thresholds for Sea Turtles	12
Table 3-4. Pre-Mission Survey Results from 14 February 2019 Hellfire Mission.....	13
Table 3-5. Comparison of Permitted vs. Actual Level of 780 TS Mission Activities.....	16
Table 4-1. Mission Day Scenarios for Maritime WSEP.....	20
Table 4-2. Distance in meters to NMFS Harassment Thresholds for Marine Mammals	21
Table 4-3. Distance in Meters to NMFS Acoustic Thresholds for Sea Turtles	22
Table 4-4. Pre-Mission Survey Results from 6 November 2019.....	24
Table 6-1. Summary of Survey Results and Live Weapon Releases in the EGTTR.....	25
Table 8-1. 2019 Sea Turtle Stranding Records for Eglin AFB.....	27

LIST OF FIGURES

Figure 2-1. Location of W-151A in the EGTTR	5
Figure 3-1. 780 TS Hellfire Mission Set-Up.....	9
Figure 3-2. 780 TS SDBII Mission Set-Up	10
Figure 3-3. Trackline of <i>Strugeon 1</i> during Pre-Mission Survey	13
Figure 4-1. Maritime WSEP Mission Location	17
Figure 4-2. Human Safety Box for November 2019 Maritime WSEP Missions.....	19
Figure 4-3. Notice to Mariners (NOTMAR) for November 2019 Maritime WSEP Missions	20
Figure 4-4. Survey Zones for Maritime WSEP Protected Species Surveys	22
Figure 8-1. Cumulative Numbers of Stranded Sea Turtles in Okaloosa County during 2019 (Ongoing) and the Previous 5-year and 10-year Averages.....	27

ACRONYMS AND ABBREVIATIONS

86 FWS	86 th Fighter Weapons Squadron
413 FLTS	413 th Flight Test Squadron
780 TS	780 th Test Squadron
AF	Air Force
AFB	Air Force Base
AFSOC	Air Force Special Operations Command
BA	Biological Assessment
BO	Biological Opinion
CCF	Central Control Facility
EGTTR	Eglin Gulf Test and Training Range
FLSTSSN	Florida Sea Turtle Stranding and Salvage Network
ft	feet
GPS	Global Positioning System
GRATV	Gulf Range Armament Test Vessel
HSMST	High Speed Maneuverable Surface Target
IHA	Incidental Harassment Authorization
ITS	Incidental Take Statement
JAGM	Joint Air-to-Ground Missile
JASSM	Joint Air-to-Surface Standoff Missile
JDAM	Joint Direct Attack Munition
km	kilometers
lb	pound
m	meter
NMFS	National Marine Fisheries Service
NOTMAR	Notice to Mariners
NPV	Non-participating Vessel
NRO	Natural Resources Office
PAM	Passive Acoustic Monitoring
PTS	Permanent Threshold Shift
SDB	Small Diameter Bomb
SRI	Santa Rosa Island
TTS	Temporary Threshold Shift
UAS	Unmanned Aerial System
WSEP	Weapon Systems Evaluation Program
ZOI	Zone of Influence

Executive Summary

Eglin Natural Resources Office (NRO) has prepared this report in accordance with the Eglin Gulf Test and Training Range (EGTTR) Letter of Authorization (LOA) under the Marine Mammal Protection Act and the Programmatic Biological Opinion/Incidental Take Statement (BO/ITS) under the Endangered Species Act. The LOA and BO/ITS include mitigation and monitoring procedures to reduce the potential for adverse impacts to marine mammals (bottlenose dolphins and Atlantic spotted dolphins) and federally listed species (green, loggerhead, Kemp's ridley, and leatherback sea turtles). This report describes the implementation of the mitigation and monitoring procedures, the results of pre- and post-mission surveys, a summary of each mission event, describes any potential take that may or may not have occurred, and analyzes the overall effectiveness of these measures.

A total of eleven mission days were completed by two user groups that involved live weapon releases in the EGTTR during calendar year 2019. Six additional live days were planned and attempted, but due to other issues, no weapon releases occurred. Eglin NRO coordinated with each proponent prior to the missions to communicate survey requirements and established survey areas for each mission day, based on the mitigation measures developed and outlined in the LOA and Programmatic BO. For AFSOC gunnery missions, pre- and post-mission surveys were conducted by trained aircrew using techniques and procedures that have been used according to previous LOAs. For 780 TS and 86 FWS missions, pre- and post-mission surveys were conducted by between one and four survey vessels, depending on the size of the survey area. For all three of the 780 TS missions, an Eglin NRO representative observed live video feed from cameras on the instrumentation barge and other assets during the mission. Four mission days were planned for the 86 FWS but only three of the four days were attempted. Due to weather and unforeseen circumstances, no live weapons were released. An Eglin NRO representative observed live video feed from Eglin's Central Control Facility (CCF) during the three days live missions were attempted. Eglin NRO anticipates the ability to continue monitoring missions from CCF in future years.

Protected species were observed during pre-mission surveys on one live mission day, consisting of two sea turtles. A sighting of 8 bottlenose dolphins occurred during the pre-mission survey for 86 FWS Maritime WSEP, but no live weapons were released during this mission. No protected species were observed during any of the missions or post-mission surveys. Therefore, Eglin NRO concludes that no marine mammal or sea turtle takes occurred as a result of 2019 EGTTR missions.

Eglin NRO believes all mitigation and monitoring measures were successfully implemented and were effective in protecting marine mammals and sea turtles from negative impacts associated with live detonations during 2019. Furthermore, based on an analysis of sea turtle stranding data for 2019, Eglin NRO believes that additional impacts from mission activities were not apparent beyond what was observed and reported during post-mission surveys.

1. Introduction

This report has been prepared in compliance with the Letter of Authorization (LOA) and Programmatic Biological Opinion (BO)/Incidental Take Statement (ITS) issued by the National Marine Fisheries Service (NMFS) for mission activities in the Eglin Gulf Test and Training Range (EGTTR). The EGTTR LOA is valid from February 13, 2018 through February 12, 2023 (Federal Register 83(27): 5545-5571, February 8, 2018). The EGTTR Programmatic BO/ITS was issued on January 13, 2017 (Consultation No. FPR-2016-9151) by the NMFS Office of Protected Resources, ESA Interagency Cooperation Division. Refer to *Table 1-16 in the EGTTR LOA Request*, *Table 1 in the LOA*, and *Table 14 in the EGTTR Programmatic BO* for a list of all live weapon allotments authorized in the EGTTR.

The EGTTR LOA addressed the potential for impacts to two species of marine mammals: bottlenose dolphins and Atlantic spotted dolphins. Eglin was authorized Level A Harassment takes in the form of slight lung injury and Permanent Threshold Shift (PTS). Eglin was also authorized Level B Harassment takes in the form of Temporary Threshold Shift (TTS) and Behavioral impacts. The annual numbers of marine mammal takes authorized in the LOA are shown in Table 1-1 below.

Table 1-1. Annual Marine Mammal Takes Authorized in the EGTTR LOA

Species	Level A Harassment		Level B Harassment	
	Slight Lung Injury	PTS (SEL)	TTS (SEL)	Behavioral
Bottlenose dolphin	2	7	220	315
Atlantic spotted dolphin	0	2	85	120
TOTAL	2	9	305	435

PTS = permanent threshold shift; TTS = temporary threshold shift; SEL = sound exposure level

The EGTTR Programmatic BO addressed the potential for impacts to four sea turtle species and included an ITS for lethal and non-lethal takes of loggerhead, Kemp's ridley, leatherback, and green sea turtles. The annual numbers of sea turtle takes authorized in the ITS are shown in Table 1-2 below.

Table 1-2. Sea Turtle Take Authorizations Included in the ITS of the EGTTR BO

Species	Mortality & Serious Injury	Impairment	Disturbance	Behavioral Response
Green sea turtle – North Atlantic DPS	28	39	1,056	11,139
Kemp's ridley sea turtle	29	40	1,079	10,905
Loggerhead sea turtle – Northwest Atlantic DPS	57	79	2,148	22,610
Leatherback sea turtle	10	17	436	5,257

DPS = distinct population segment

1.1 Human Safety Procedures

Prior to missions that require a closure of any portion of the Gulf of Mexico, Eglin AFB issues a Notice to Mariners (NOTMAR) describing to all local vessels the upcoming activities which includes a map showing the boundaries of the human safety zone. All boat captains leaving the East Pass near Destin, FL are provided with maps and GPS points of the safety zone before they enter the Gulf. Up to 25 Air Force (AF) vessels may conduct range clearing activities for at least two hours before the mission starts to inform and when necessary, escort civilian vessels outside the safety box. Depending on the weapons being deployed, the size and shape of the safety box varies, therefore the number of boats needed to secure the perimeter also varies. The human safety zone restriction also applies to vessels conducting pre-mission surveys for protected marine species (Refer to Section 1.2 below). Safety and survey boat captains maintain radio contact with each other and the Eglin Tower on Test Site A-13B on Santa Rosa Island (SRI Tower) to provide, receive, and relay information needed to clear the range. Once survey boats have completed pre-mission surveys for protected species, they must immediately exit the safety box and typically assist the guard boats with enforcing the safety box. Missions cannot begin until it is confirmed that the entire safety box is clear of human presence. During the missions, the safety and survey boats remain at specific guard locations along the perimeter of the human safety box to restrict boat access into the range, until the mission is completed.

Gunnery missions conducted by the Air Force Special Operations Command (AFSOC) and the 413th Flight Test Squadron (413 FLTS) typically do not require vessel support to clear the Gulf of human presence. The main aircraft platforms these groups use are gunships that are equipped with infrared sensors and low-light TV cameras that provide sufficient zooming and scanning capabilities to survey the mission areas for the presence of non-participating vessels and protected species. Moreover, these aircraft are capable of loitering on site for the amount of time necessary to identify and move clear of areas with either humans or protected species.

1.2 General Mitigation and Monitoring Requirements

Eglin NRO and NMFS developed mission-specific mitigation and monitoring requirements during the consultation processes to minimize the potential for adverse impacts to protected species. Eglin proposed to visually survey mission areas to ensure they are clear of protected species before live missions begin. The size of the survey area depends on the type of weapons being dropped and the detonation scenario (i.e., surface or subsurface detonation). *The discussion of each mission activity in the following sections includes how Eglin NRO determined what survey areas were needed.*

All personnel conducting visual surveys for protected species are required to complete a training course in identifying marine species, annually. The training includes a summary of applicable environmental laws, consequences of non-compliance, description of an observer's roles, pictures and descriptions of protected species and protected species indicators, example survey techniques, recommended equipment, and reporting procedures. The training must be given by Eglin NRO biologists. In some cases, training slides are sent directly to the training manager for select user groups, with the requirement that computer-generated certificates of completion for each

prospective observer must be sent to Eglin NRO. During the 2019 calendar year, 41 observers completed their annual training and sent their completed certificates to Eglin NRO.

For vessel-based surveys, all boat captains and observers participated in previous Maritime Strike and Maritime WSEP missions conducted annually from 2013 through 2017. As a result, completion of this training requirement in 2019 served as a refresher course. The vessels and associated crew designated specifically for protected species monitoring for all live EGTTR missions in 2019 were *Sturgeon 1*, *Sea Eagle*, *El Jefe*, and *Miss Daisy*.

For aerial surveys conducted by mission personnel on gunships, the training slides are provided to aircrew as part of the standard annual unit training requirements. Digitally-signed training certificates for designated observers are provided to Eglin NRO certifying that the training has been completed and personnel are aware of their observer roles and responsibilities, including reporting procedures. Eglin NRO maintains a list of personnel with updated training certificates.

The following sections summarize activities of each user group that released live weapons in the EGTTR, describe the implementation of the mitigation and monitoring requirements, identify the levels of take that occurred, and assess the effectiveness of Eglin's mitigation and monitoring procedures.

2. AFSOC – Air-to-Surface (A-S) Gunnery Training

AFSOC conducts air-to-surface gunnery training activities with multiple types of munitions primarily in Warning Area-151A (W-151A) in the EGTTR (Figure 2-1). Gunnery rounds include 25-millimeter (mm) high explosive incendiary (HEI), 30-mm HEI, 40-mm HEI, and 105-mm HEI rounds. Net explosive weight (NEW) ranges from about 0.07 to 4.7 pounds. The Air Force developed a 105-mm training round (TR) that contains less than 10 percent of the amount of explosive material contained in the 105-mm full-up (FU) round.



Figure 2-1. Location of W-151A in the EGTR

2.1 Mission Set-Up

As stated in Section 1.1, the gunships contain sensor systems that can reliably clear areas of the Gulf for non-participating vessels and protected species. In addition, these training units typically do not require the use of target boats, but instead deploy MK-25 flares as targets. Therefore, minimal equipment and assets are needed to support these missions.

2.2 Mitigation and Monitoring Requirements

AFSOC has been conducting air-to-surface gunnery training operations in the EGTR under various MMPA Authorizations since 2006. Accordingly, they have successfully implemented mitigation and monitoring requirements for the protection of marine mammals and sea turtles, which includes conducting aerial surveys immediately prior to commencement of firing gunnery rounds. Table 2-1 lists the Mission Day Scenarios for the AFSOC gunnery missions as described in the EGTR LOA application.

Table 2-1. AFSOC Gunnery Training Categorized as Representative Mission Days

Mission Day Scenario	Munition	NEW (lbs)	Detonation Type	Munitions per Day	Mission Days/Year	Total Munitions/Year
D	105 mm HE (FU)	4.7	Surface	30	25	750
	40 mm HE	0.87	Surface	64		1,600
	30 mm HE	0.1	Surface	500		12,500
	25 mm HE	0.067	Surface	560		14,000
E	105 mm HE (TR)	0.35	Surface	30	45	1,350
	40 mm HE	0.87	Surface	64		2,880

Mission Day Scenario	Munition	NEW (lbs)	Detonation Type	Munitions per Day	Mission Days/Year	Total Munitions/Year
	30 mm HE	0.1	Surface	500		22,500
	25 mm HE	0.067	Surface	560		25,200
Total					70	80,780

FU = Full Up; HE = High Explosive; lbs = pounds; mm = millimeter; NEW= net explosive weight; TR = Training Round

Table 2-2. Monitoring Area Radii for Gunnery Missions

Aircraft	Gunnery Round	Monitoring Area Radius	Monitoring Altitude	Operational Altitude
AC-130 gunship	25 mm, 30 mm, 40 mm, 105 mm (FU and TR)	5 NM (9,260 m)	6,000 ft	15,000 – 20,000 ft
CV-22 Osprey	.50 cal, 7.62 mm	3 NM (5,556 m)	1,000 ft	1,000 ft

cal = caliber; ft = feet; FU = full up; m = meters; mm = millimeter; NM = nautical miles; TR = Training Round

Table 2-2 shows the ranges for monitoring of gunnery missions. Per the LOA, missions that consist solely of gunnery testing and training operations will survey larger areas than would be necessary based solely on acoustic impact zones at a Level A Harassment/PTS threshold because of previously established safety profiles and the Air Force’s ability to conduct aerial surveys of larger areas from mission aircraft during these activities. Monitoring procedures are described in *Section 11.2.2* of the LOA (Table 2-2, Table 2-3, and Table 2-4). This conservative approach allows both marine mammals and sea turtles adequate coverage under Eglin NRO’s mitigation requirements for AFSOC gunnery missions.

Table 2-3. Distance in meters to NMFS Harassment Thresholds for Marine Mammals

Mission Day Scenario	Mortality ¹		Level A Harassment				Level B Harassment	
			Slight Lung Injury ²		GI Tract Injury ³	PTS ^{4, 5} (SEL)	TTS ^{4, 6} (SEL)	Behavioral ⁷ (SEL)
	BND	ASD	BND	ASD				
D	24	30	55	67	59	254	982	1,413
E	10	13	24	30	34	232	878	1,252

¹ Positive impulse metric from the Goertner mortality model equation that uses the mass of a newborn calf of affected species

² Positive impulse metric from the Goertner injury model equation that uses the mass of a newborn calf of affected species

³ Peak pressure metric of 237 dB re 1 μ Pa (unweighted SPL)

⁴ These thresholds use dual criteria, one based on cumulative weighted SEL and one based on peak unweighted SPL. SEL metric was used because the distance was larger than SPL.

⁵ Weighted SEL metric of 185 dB re 1 μ Pa²·s

⁶ Weighted SEL metric of 170 dB re 1 μ Pa²·s

⁷ Weighted SEL metric of 165 dB re 1 μ Pa²·s

ASD = Atlantic spotted dolphin; BND = bottlenose dolphin; dB re 1 μ Pa = decibels referenced to 1 micropascal; dB re 1 μ Pa²·s = decibels referenced to 1 micropascal-squared second; GI = gastrointestinal; NMFS = National Marine Fisheries Service; PTS = permanent threshold shift; SEL = sound exposure level; SPL = sound pressure level; TTS = temporary threshold shift

Table 2-4. Distance in meters to NMFS Acoustic Thresholds for Sea Turtles

Munition	NEW (lbs)	Detonation Scenario	Mortality and Serious Injury	Impairment	Disturbance	Behavioral Response
105 mm FU	4.7	Surface	130	218	426	33,844
40 mm burst	0.87	Surface	74	124	243	19,331
105 mm TR	0.35	Surface	55	91	179	14,225
30 mm burst	0.1	Surface	36	60	118	9,389

25 mm burst	0.067	Surface	32	53	103	8,200
-------------	-------	---------	----	----	-----	-------

FU=Full Up; lbs=pounds; mm=millimeter; NEW=Net Explosive Weight; TP=Target Practice

Prior to beginning firing activities, the gunships conduct low-altitude orbits around the prospective firing location to ensure the ZOI area is clear of protected species. At least two orbits must be completed before climbing to operational altitudes. The aircraft's sensors are turned on for the duration of the pre-mission survey, the mission, and the post-mission survey. Gunship aircrews have consistently completed and maintained their Marine Species Observer Trainings, allowing them to serve as designated observers during their own missions. Eglin NRO receives completed and signed certificates once trainings are completed. The aircrew also submit mission report forms after each mission is completed with results of pre- and post-mission surveys.

2.3 Description of AFSOC A-S Gunnery Training Activities

Eight A-S gunnery missions were conducted during the 2019 calendar year. Copies of all Protected Species Observer Report Forms are included in Appendix A of this report. Table 2-5 summarizes the results of the report forms.

Table 2-5. Summary of Air-To-Surface Gunnery Missions for 2019

Date of Mission	Pre-Mission Surveys ^a		Mission Times		Post-Mission Surveys ^a		Rounds Used	# of Rounds Expended	Protected Species Observed?
	Start	End	Start	End	Start	End			
8/6/19	2100 ^b	2115 ^b	2100 ^b	2300 ^b	2245 ^b	2300 ^b	30 mm HE	300	No
8/9/19	1359 ^b	1410 ^b	1415 ^b	1419 ^b	1420 ^b	1428 ^b	105 mm FU	5	No
8/12/19	1745 ^b	1900 ^b	1800 ^b	1900 ^b	1855 ^b	1910 ^b	25 mm HE	181	No
							40 mm HE	64	
							105 mm FU	30	
8/13/19	1140	1215	1220	1310	1310	1320	105 mm TR	15	Yes
8/22/19	1415	1425	1430	1640	1645	1650	105 mm TR	15	No
8/23/19	1649	1700	1700	1722	1729	1736	105 mm TR	5	No
8/28/19	1700	1715	1715	1830	1830	1845	25 mm HE	100	No
							40 mm HE	64	
							105 mm FU	4	
9/18/19	1515	1545	1545	1700	1700	1720	40 mm HE	64	No
							105 mm FU	30	

FU = Full-Up; HE = High Explosive; TR = Training Round; mm = millimeter

NOTE: Cells highlighted in blue are for missions conducted 30 minutes prior to sunset or later.

^a All pre-and post-mission surveys occurred 15 minutes prior to and after live fire was complete

^b Timeline discrepancies explained in text below

2.4 AFSOC Mission Summary

Table 2-6 summarizes A-S gunnery expenditures during the 2019 calendar year and compares it with the annual allocations covered under the existing LOA and BO. The number of A-S gunnery activities conducted in the EGTR for the reporting period were well below the total amounts authorized per year. As indicated in Table 2-5, one observer reported protected marine species. Two large sea turtles were observed during the pre-mission survey on 13 August 2019. Aircrew documented the sighting on the report form and the mission was delayed an additional 20 minutes

until the animals were observed leaving the ZOI. The mission commenced upon confirmation from aircrew that the ZOI was clear. No protected species were observed during the mission or on the post-mission survey. Since no protected species were observed during the mission or post-mission surveys, Eglin NRO concludes that no takes occurred on this day's mission.

Eglin NRO notes that in three of the Protected Species Observer Report Forms, there are minor time issues and discrepancies. Regarding the mission on 9 August 2019, it appears the observer began writing time in local time and then switched to Zulu (military) time. The times stated on the pre-mission survey also did not make sense. Upon follow-up by Eglin NRO, the observer indicated that he made a mistake when recording the time and that the arrival time at the site and the start time of the pre-mission survey should have been an hour prior to what he listed. The other two report forms that displayed time discrepancies were on 6 August 2019 and 12 August 2019. In these reports, it appeared as though the times listed didn't fall sequentially. Eglin NRO reached out to the two observers and received a response back from both confirming that they included the pre- and post-mission survey times as part of the overall mission to reflect the entire time over the water range. The pre- and post-mission surveys occurred 15 minutes prior to live fire and 15 minutes after live fire was complete.

No marine mammal or sea turtle takes occurred resulting from 2019 A-S gunnery mission activities.

Table 2-6. Comparison of Permitted vs. Actual Level of A-S Gunnery Mission Activities

	# Daytime Missions	# Nighttime Missions	25 mm HE	30 mm HE	40 mm HE	105 mm FU	105 mm TR
Total Annual Allotments	25	45	39,200	35,000	4,480	750	1,350
Actual Usage	5	3	281	300	192	69	35
Unused Allotments	20	42	38,919	34,700	4,288	681	1,315

FU = Full-Up; HE = High Explosive; TR = Training Round; mm = millimeter

3. 780th Test Squadron (780 TS)

The 780th Test Squadron (780 TS) conducts testing activities on a variety of weapons, including the AGM-158 (Joint Air-to-Surface Standoff Missile [JASSM]), GBU-39 (Small Diameter Bomb I [SDB-I]), AGM-114L (Longbow missile), GBU-53 (SDB-II), Joint Air-to-Ground Missile (JAGM), and others. Test missions for the 780 TS typically involve a one-time event using multiple weapon systems, with a small number of weather back-up days. Eglin NRO coordinates with the 780 TS prior to each test mission to develop a plan for pre-mission surveys and other monitoring requirements, depending on the weapons being dropped and other mission assets that may be available.

In calendar year 2019, 780 TS proposed to release two JAGM missiles as part of their test events. Only one annual allotment for a JAGM munition was listed under their weapons in the LOA, so Eglin NRO substituted an AGM-114 Hellfire allotment from the "96 OG Future Missions" in place of the JAGM to cover the test. The 96 OG Future Missions group allotments are used for overages,

such as this case, to account for unanticipated missions. All other test events by the 780 TS for 2019 were covered under their annual munition allotments in the LOA.

3.1 Mission Set-Up

3.1.1 Hellfire Missions

Hellfire test missions for the 780 TS were scheduled in W-151A of the EGTTR. The test site is approximately 17 NM (31 km) offshore from Santa Rosa Island (SRI). Figure 3-1 shows the location and basic set-up for these test missions conducted in February and April 2019. Water depth of the mission site was approximately 120 ft (37 m). The proposed target area was located approximately 750 ft north of the Gulf Range Armament Test Vessel (GRATV) instrumentation barge. The human safety zone was between 13 NM (24 km) and 15 NM (28 km) in diameter. Human safety procedures similar to those described in Section 1.1 were followed. Given the types of weapons released by the 780 TS and the size of the human safety box, 15 AF vessels were used to enforce the safety box.

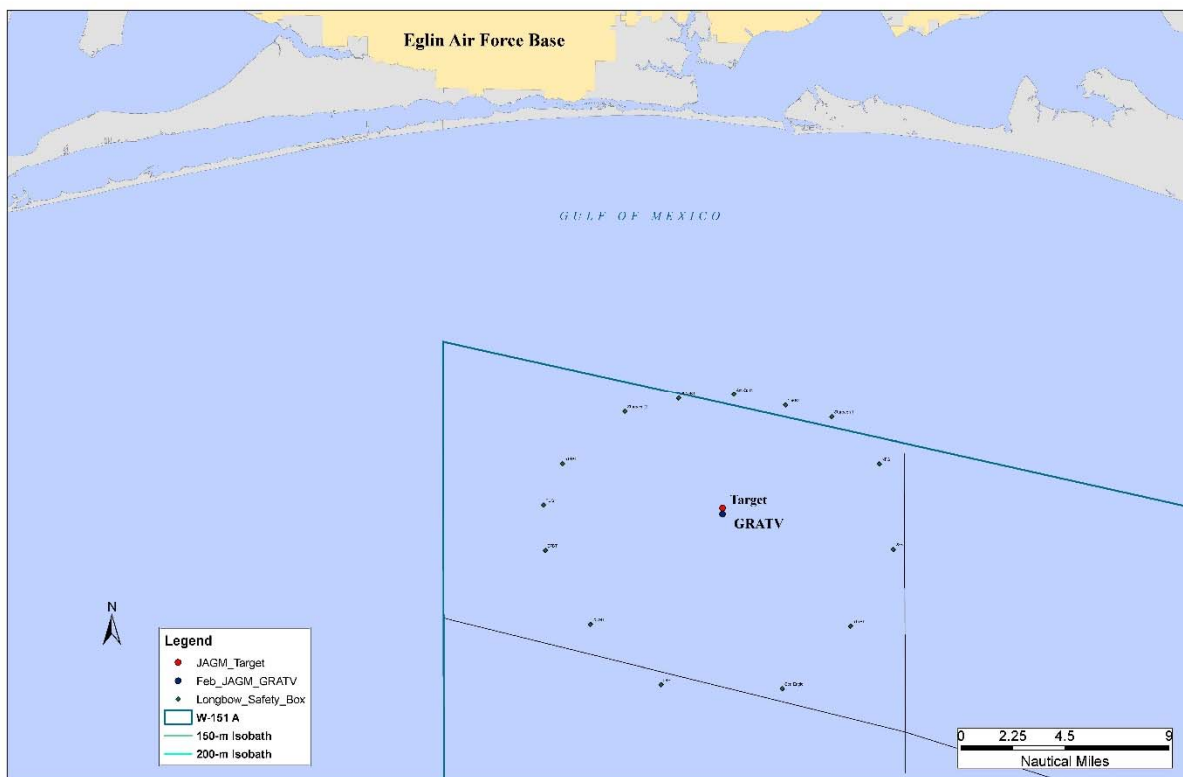


Figure 3-1. 780 TS Hellfire Mission Set-Up

3.1.2 Small Diameter Bomb (SDB)-II Mission

The SDB-II mission for the 780 TS was scheduled in W-151A of the EGTTR. The test site is approximately 17 NM (31 km) offshore from SRI. Figure 3-2 shows the location and basic set-up for this test mission conducted in April 2019.

Water depth of the mission site was approximately 120 ft (37 m). The proposed target area was located north of the GRATV. The human safety zone was between 29 NM (53.7 km) and 30 NM (55.5 km) in diameter. Human safety procedures similar to those described in Section 1.1 were followed. Given the types of weapons released by the 780 TS and the size of the human safety box, 27 AF vessels were used to enforce the safety box.

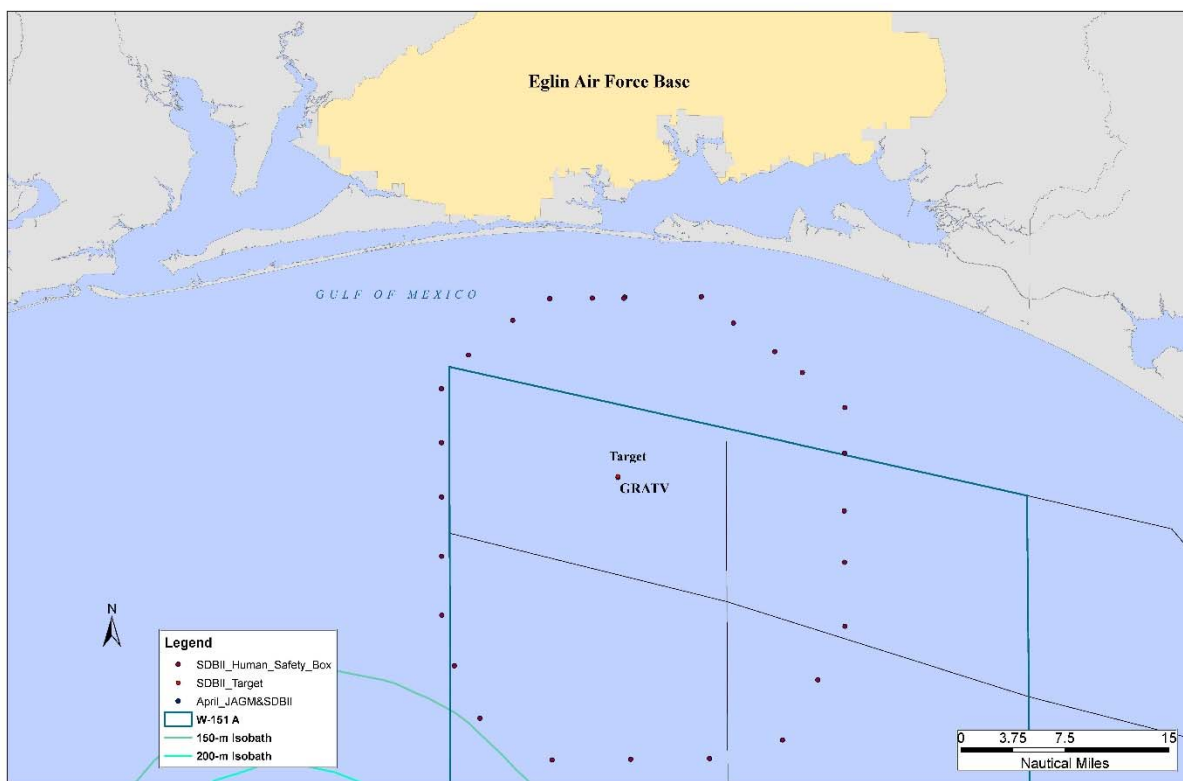


Figure 3-2. 780 TS SDBII Mission Set-Up

3.2 Mitigation and Monitoring Requirements

Table 3-1 lists the Mission Day Scenarios for the weapons proposed to be released by the 780 TS in the EGTTTR LOA application. The Table also includes Mission Day Scenario “S” for the 96 OG Future Missions group to account for the Hellfire allocation used by the 780th TS.

Table 3-1. 780 TS Weapons Testing Categorized as Representative Mission Days

Mission Day Scenario	Munition	NEW (lbs)	Detonation Type	Munitions per Day	Mission Days/Year	Total Munitions/Year
M	AGM-158 (JASSM)	240	Surface	2	1	2
N	GBU-39 (SDB I)	37	Surface	2	1	2
	GBU-39 (SDB I) Double Shot ^a	74	Surface	2		2
O	GBU-53 (SDB II)	22.84	Surface	2	1	2

P	JAGM	27.41	Surface	1	1	1
Q	Inert LSDB & SDB II GTV (fuse only)	0.4	Surface	2	4	8
S ^b	AGM-114 (Hellfire)	29	Subsurface ^c	10	2	20

AGM = Air-To-Ground Missile; GBU = Guided Bomb Unit; GTV = Guided Test Vehicle; JAGM = Joint Air-to-Ground Missile; JASSM = Joint Air-To-Surface Standoff Missile; lbs = pounds; LSDB = Laser Small Diameter Bomb; SDB = Small Diameter Bomb

^aNEW is doubled for each simultaneous launch

^b 96 OG Future Missions allocation for AGM-114 (Hellfire)

^c Subsurface detonations occur at 10 feet water depth

Table 3-2 shows the ranges to effects for the various thresholds under each of the above scenarios, also mentioned in the LOA. These distances were used to determine the radius of the area to be monitored during pre- and post-mission surveys. Since the 96 OG Mission Day Scenario S accounts for up to 10 Hellfire missiles, 2 SDB-Is, and 1 Maverick being released on the same day, Eglin NRO personnel determined that the threshold radius would be overly conservative for this test that only involved releasing one live Hellfire. Therefore, Eglin NRO used the NEW for the JAGM (27.41 lbs) and associated Mission Day Scenario P Level A/PTS threshold distance to effect for the 780 TS Hellfire tests. The rationale for using Level A/PTS threshold distances to effect for establishing the survey area is provided in the LOA request.

Table 3-2. Distance in meters to NMFS Harassment Thresholds for Marine Mammals

Mission Day Scenario	Mortality ¹		Level A Harassment				Level B Harassment	
			Slight Lung Injury ²		GI Tract Injury ³	PTS ^{4,5} (SEL)	TTS ^{4,6} (SEL)	Behavioral ⁷ (SEL)
	BND	ASD	BND	ASD				
M	120	150	249	290	220	447	825	1,123
N	76	96	168	201	149	201	557	982
O	47	60	107	131	101	204	376	640
P	51	65	115	141	107	217	400	527
Q	7	9	16	20	26	53	98	207

¹ Positive impulse metric from the Goertner mortality model equation that uses the mass of a newborn calf of affected species

² Positive impulse metric from the Goertner injury model equation that uses the mass of a newborn calf of affected species

³ Peak pressure metric of 237 dB re 1 μ Pa (unweighted SPL)

⁴ These thresholds use dual criteria, one based on cumulative weighted SEL and one based on peak unweighted SPL. SEL metric was used because the distance was larger than SPL.

⁵ Weighted SEL metric of 185 dB re 1 μ Pa²·s

⁶ Weighted SEL metric of 170 dB re 1 μ Pa²·s

⁷ Weighted SEL metric of 165 dB re 1 μ Pa²·s

ASD = Atlantic spotted dolphin; BND = bottlenose dolphin; dB re 1 μ Pa = decibels referenced to 1 micropascal; dB re 1 μ Pa²·s = decibels referenced to 1 micropascal-squared second; GI = gastrointestinal; NMFS = National Marine Fisheries Service; PTS = permanent threshold shift; SEL = sound exposure level; SPL = sound pressure level; TTS = temporary threshold shift.

Table 3-3 presents the ranges to effect from JAGM detonations for the various NMFS acoustic thresholds for sea turtles. It is an excerpt from Table 4-5 of the BA and Table 20 of the BO.

Table 3-3. Distance in Meters to NMFS Acoustic Thresholds for Sea Turtles

Munition	NEW (lbs)	Detonation Scenario	Mortality and Serious Injury	Impairment	Disturbance	Behavioral Response
JAGM	27.41	Surface	234	392	768	61,025

JAGM = joint air-to-ground missile; lbs = pounds; NEW = net explosive weight

To simplify planning and implementation of requirements, the Level A/PTS radius distance for Scenario “P” (217 m) was selected for both 780 TS Hellfire missions. The rationale for using Level A/PTS threshold distances to effect for establishing the survey area is provided in the LOA request. Eglin NRO biologists doubled the distance to account for animals that could swim into the ZOI after surveys are completed. This resulted in a radius equal to 434 m (0.234 NM). Since the weapons were being deployed against a moving target and it could be slightly north, south, east, or west of the actual impact point, Eglin Natural Resources selected to increase the survey area to 1 km (0.54 NM) radius. Given the relatively small size of the survey area, only one boat was used for the surveys, *Sturgeon 1*.

Based on the proposed munitions to be expended for the SDBII mission, Mission Day Scenarios “O” and “Q” were chosen for the SDB tests. To simplify planning and implementation requirements, the Level A/PTS radius distance for Scenario “O” was selected since it had the larger radius of the two mission day scenarios. Eglin NRO biologists doubled the distance to account for animals that could swim into the ZOI after surveys are completed. This resulted in a radius equal to 408 m (0.22 NM). Since the weapons were being deployed against a moving target and it could be slightly north, south, east, or west of the actual impact point, Eglin Natural Resources selected to increase the survey area to 1 km (0.54 NM) radius. Additionally, the increased buffer accounted for animals potentially moving into the ZOI since detonations were separated by an unknown amount of time (less than an hour). Given the relatively small size of the survey area, only one boat was used for the surveys, *Sturgeon 1*.

3.3 Description of 780 TS Tests

3.3.1 Hellfire Tests

These 780 TS test missions involved shooting Hellfire missiles at moving targets (boat). Two live missions were initially proposed, including a height of burst (HOB) detonation and a surface detonation. The HOB shot consists of the weapon detonating approximately 4 ft above the target (airburst). Due to the late cancellation of the second proposed mission, a third mission day was proposed and successfully executed.

3.3.1.1 Thursday 14 February 2019

3.3.1.1.1 Pre-Mission Survey Results

Sturgeon 1 left the dock at 4:45 AM and arrived at the survey area at 6:15 AM. Weather and sea-state conditions were good with 1 ft seas and no white caps. Visibility was around 400 m. Pre-mission survey began at 6:15 AM and was completed at 7:15 AM. Figure 3-3 shows the trackline of *Sturgeon 1* for the survey. There were no protected species sightings during the pre-mission survey; however, there was a large flock of birds observed, which is considered a protected marine species indicator (

Table 3-4).

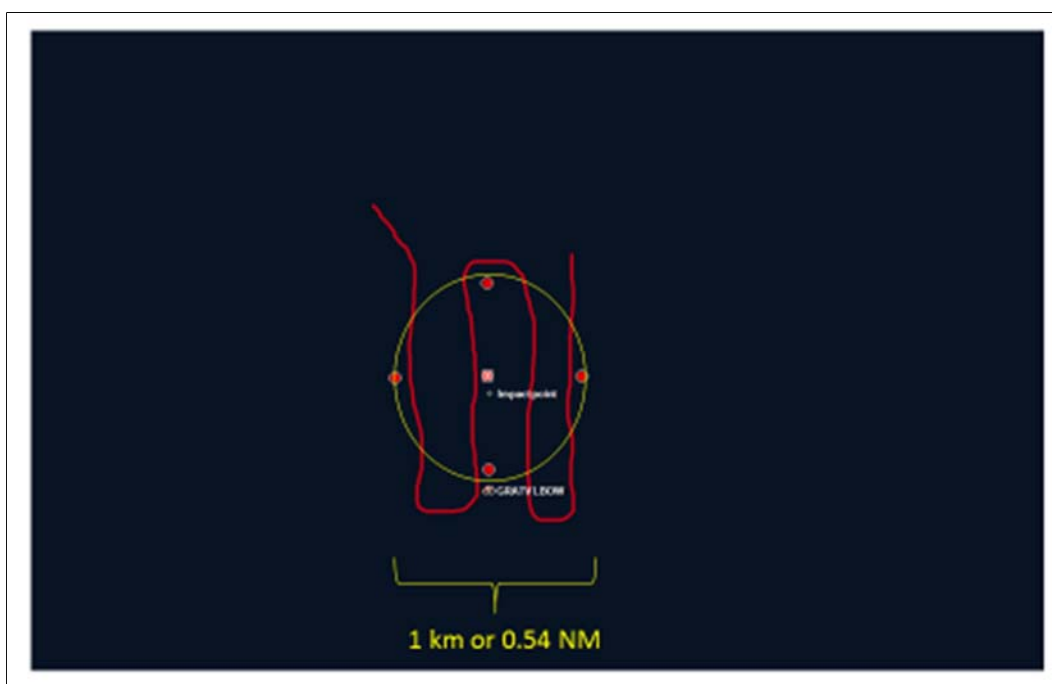


Figure 3-3. Trackline of *Sturgeon 1* during Pre-Mission Survey

Table 3-4. Pre-Mission Survey Results from 14 February 2019 Hellfire Mission

#	Time	Vessel	Sighting	Location	Resolution
1	7:00 AM	<i>Sturgeon 1</i>	Large flock of birds	30° 11.230 N 86° 36.252 W	Protected marine species indicator was noted; no protected species observed.

3.3.1.1.2 Mission Results

Only one missile was released and detonated at 12:48:08 PM. This was a surface shot. No other weapons were released on this day due to technical difficulties. Mission was completed at 1:30 PM. In this particular case, the pre-mission survey was completed over 4 hours prior to live weapons being released. The Eglin NRO representative present at CCF monitored this mission and could have reported any marine mammal sightings to the Safety Officer, had there been any. This contingency mitigated the lapse of time between when the pre-mission survey was completed and when live detonations actually occurred.

3.3.1.1.3 Post-Mission Survey Results

The post-mission survey began at 3:41 PM and ended at 4:40 PM. No protected species were observed.

3.3.1.1.4 Take Analysis

Even though a large flock of birds was observed during the pre-mission survey, no protected species were observed during the pre-mission survey, mission, or post-mission survey. Therefore, Eglin NRO concludes that no takes occurred during this mission day.

3.3.1.2 Friday 15 February 2019

The mission set-up for this day's mission was identical to the previous day.

3.3.1.2.1 Pre-Mission Survey Results

Sturgeon 1 left the dock at 5:00 AM and transited to the survey start point location. Pre-mission survey began at 6:54 AM. Wave height was approximately 3 ft with some white caps. Weather conditions were fair and cloudy with visibility around 300 m. Pre-mission survey was completed at 7:35 AM. No protected species were observed.

3.3.1.2.2 Mission Results

Upon arrival at C-7 to monitor the mission, the Eglin NRO representative was informed that there were various technical and aircraft issues, so the test engineer decided to cancel the mission. As a result, no weapons were released.

3.3.1.2.3 Post-Mission Survey Results

Since no weapons were released, a post-mission survey was not required.

3.3.1.2.4 Take Analysis

No takes occurred during this mission day because no weapons were released.

3.3.1.3 Tuesday 30 April 2019

The mission set-up for this day's mission was identical to the February mission.

3.3.1.3.1 Pre-Mission Survey Results

Sturgeon 1 left the dock at 5:00 AM and transited to the survey start point location. Pre-mission survey began at 6:20 AM. Pre-mission survey was completed at 7:10 AM. No protected species were observed.

3.3.1.3.2 Mission Results

The first missile, a surface shot, was released and detonated at 8:31:44 AM. The second missile, a height-of-burst shot, was released and detonated at 8:33:00 AM. Both missiles hit moving boat targets as planned. No other weapons were released on this day. Mission was completed at 8:35 AM.

3.3.1.3.3 Post-Mission Survey Results

The post-mission survey began at 9:40 AM and ended at 10:30 AM. No protected species were observed.

3.3.1.3.4 Take Analysis

No protected species were observed during the pre-mission survey, mission, or post-mission survey. Therefore, Eglin NRO concludes that no takes occurred during this mission day.

3.3.2 Small Diameter Bomb (SDB) II Tests

This 780 TS test mission involved deploying small diameter bombs (SDBs) at a moving target (boat). Two inert SDB-IIs with live fuses and two live full-up SDB-IIs were proposed for release on the same day. All were surface detonations.

3.3.2.1 Wednesday 17 April 2019

3.3.2.1.1 Pre-Mission Survey Results

Sturgeon 1 left the dock at 5:00 AM and transited to the survey start point location. Pre-mission survey began at 6:25 AM. Weather and sea state conditions were good with partly cloudy skies and visibility around 400 m. Pre-mission survey was completed at 7:25 AM. No protected species were observed.

3.3.2.1.2 Mission Results

The Eglin NRO representative arrived at CCF at 9:19 AM to begin monitoring for the live mission with underwater detonation. The first inert SDB-II with live fuse had already been released. That weapon tracked toward the moving boat target, but didn't hit it. It is unclear whether the weapon detonated or not. Test engineers had issues with the remotely-controlled boat target. The second inert SDB-II with live fuse was released and hit moving boat target and detonated at 9:52:23 AM. The first full-up SDB-II was released and detonated at 11:30:44 AM. The second live full-up SDB-II was released and detonated at 11:40:51 AM. Both live weapons hit moving boat targets as planned. Mission was completed at 11:41:10 AM.

3.3.2.1.3 Post-Mission Survey Results

The post-mission survey began 12:35 PM and ended at 1:05 PM. No protected species were observed.

3.3.2.1.4 Take Analysis

No protected species were observed during the pre-mission survey, mission, or post-mission survey. Therefore, Eglin NRO concludes that no takes occurred during this mission day.

3.4 780 TS Mission Summary

Table 3-5 summarizes 780 TS expenditures during the 2019 calendar year and compares it with the annual allocations covered under the existing LOA and BO. The LOA only accounted for one JAGM release for a 780 TS test per year. Since the 780 TS did not have another JAGM allocation to cover the Hellfire test in April 2019, Eglin NRO used one Hellfire allocation from the 96 OG Future Missions group. The 96 OG Hellfire allocation is for a subsurface detonation; however, the Hellfire missile expended during the 780 TS April 2019 mission detonated at the surface and therefore probably impacted the ZOI less intensively.

Table 3-5. Comparison of Permitted vs. Actual Level of 780 TS Mission Activities

Weapons^a	Mission Category Day	Total Munitions per Year	Actual Munitions Released in 2019	Unused Munitions in 2019
JAGM^b	P	1	1	0
Hellfire (AGM-114)^c	S	10	1	9
SDB-II^b	O	2 ^d	2 ^d	0
	Q	8 ^e	2 ^e	6

^a This table is representative of surface and subsurface detonations only; airburst detonations are not included in this table

^b 780th TS Mission Group annual munition test allotments

^c Total annual allotments for Hellfire (AGM-114) from the 96 OG Future Missions Group – 780th TS used 1 allocation

^d SDB-II live detonation

^e SDB-II inert with live fuse detonation

Overall, the 780 TS missions and weapon releases did not exceed those authorized in the LOA. Furthermore, no protected species were observed during post-mission surveys after each of the tests. Therefore, no takes of marine mammals or sea turtles occurred as a result from 780 TS mission activities in 2019.

4. 86th Fighter Weapons Squadron (86 FWS) – Maritime Weapons Systems Evaluation Program (WSEP)

The 86th Fighter Weapons Squadron (86 FWS) evaluates multiple types of live and inert weapons systems to develop tactics, techniques, and procedures for U.S. Air Force (USAF) strike aircraft to counter small, fast, and agile surface vessels. Mission activities in the EGTTTR consist of various

types of aircraft releasing multiple live and inert weapons in a given mission day. Each Maritime WSEP cycle includes four consecutive mission days scheduled with an additional day reserved for a weather back-up, if range time is available. During calendar year 2019, missions were planned to occur on 4 – 7 November 2019. Missions conducted in November did not release any live munitions; however, details of the mission are discussed below. As part of Passive Acoustic Monitoring (PAM) efforts prescribed by NMFS under ESA Section 7 Terms and Conditions, Eglin AFB Natural Resources deployed hydrophones within the mission area in an attempt to record *in situ* sound energy and pressure levels during the planned live weapon releases of the November Maritime WSEP mission. These measurements are intended to help validate and/or refine the acoustic modeling used to calculate the impact areas for marine mammals. Eglin AFB Natural Resources was unsuccessful in their attempt to collect live detonation data since no live weapons were released due to inclement weather, limited aircraft availability, and search and rescue efforts for a missing airman in the Gulf of Mexico.

4.1 Mission Set-Up

Maritime WSEP missions are conducted in W-151A of the EGTTR. The GRATV was anchored approximately 17 NM (31 km) offshore from SRI. Figure 4-1 shows the location and basic site plan used for all Maritime WSEP mission days. Water depth of the mission site from the GRATV anchor point to the southern portion of the Primary Track ranges between 120 ft (37 m) and 150 ft (46 m).

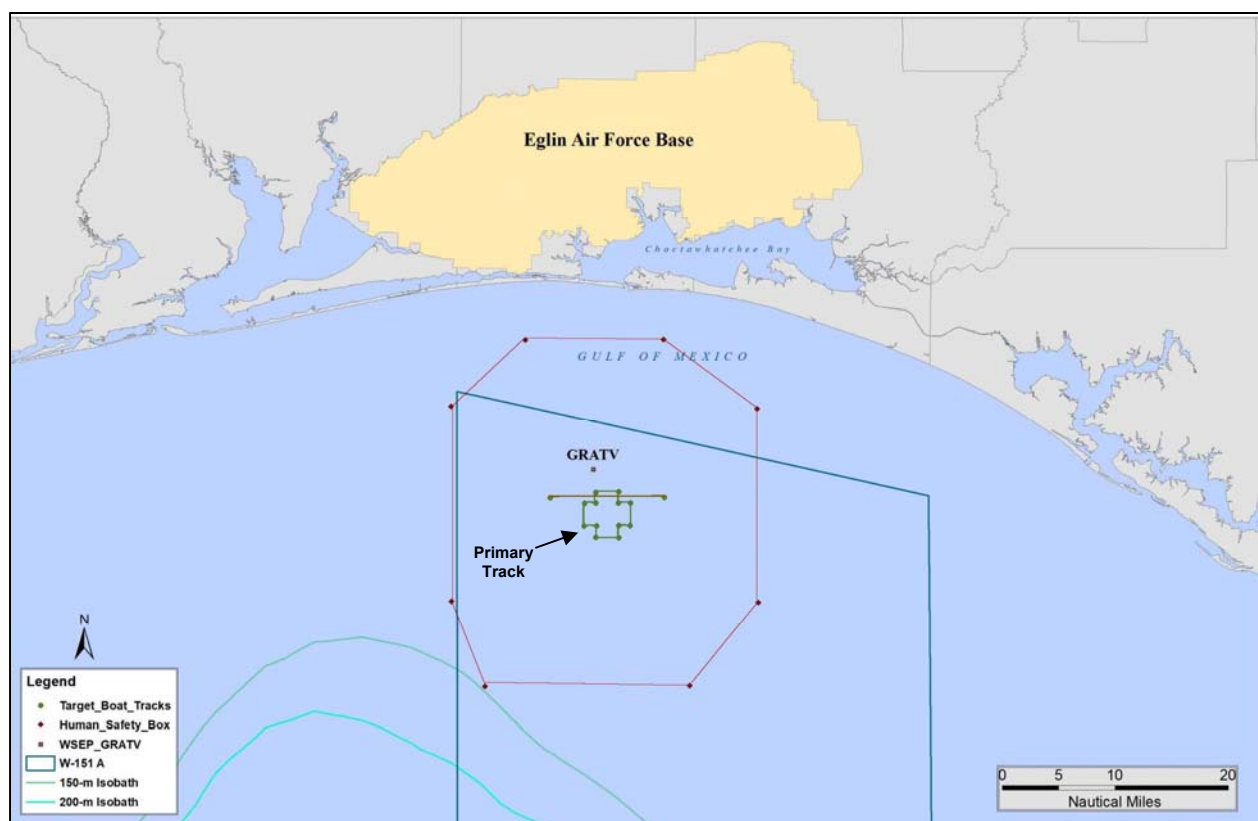


Figure 4-1. Maritime WSEP Mission Location

4.1.1 Targets

Remotely-controlled boats called high speed maneuverable surface targets (HSMSTs) towed the actual target boats at distances between 300 ft and 500 ft behind them. The proponent set up multiple tracks for the HSMSTs to travel on, including the Primary Track and the GBU-54/AGM-114L Track, where all weapon drops were planned.

4.1.2 Site Plan and Cameras

The entire mission site was continuously monitored from a variety of platforms before and during the mission. Four video cameras were set up on the GRATV. The cameras were remotely-controlled to follow a given target and can zoom in to capture direct weapon impact, or zoom out to determine whether the target was missed. While the main purpose of all video footage is to document weapons performance, they also monitored the area for unauthorized civilian boats and protected marine species before the weapons were released. In addition, HSMSTs towing target boats on the Primary Track had cameras facing the target boats to document impacts and help confirm whether detonation occurred. Video feed from all cameras was transmitted to Eglin's CCF and monitored by the proponents, Eglin Test Safety, and Eglin NRO personnel. In addition, Eglin utilized the radar from the 300-ft tower at Test Site A-13B on SRI to assist with clearing the human safety zone from civilian vessels.

4.1.3 Human Safety Zone

Figure 4-2 shows the human safety box established around the mission site. The size and shape of the safety box takes into account the safety profiles for the weapons and the multiple weapon impact locations along any of the weapon release tracks and the static targets. Based on these factors, the human safety zone was between 27 NM (52 km) and 35 NM (64 km) in diameter. Given the size of the human safety box, twenty-seven AF vessels were on guard duty along the safety perimeter.

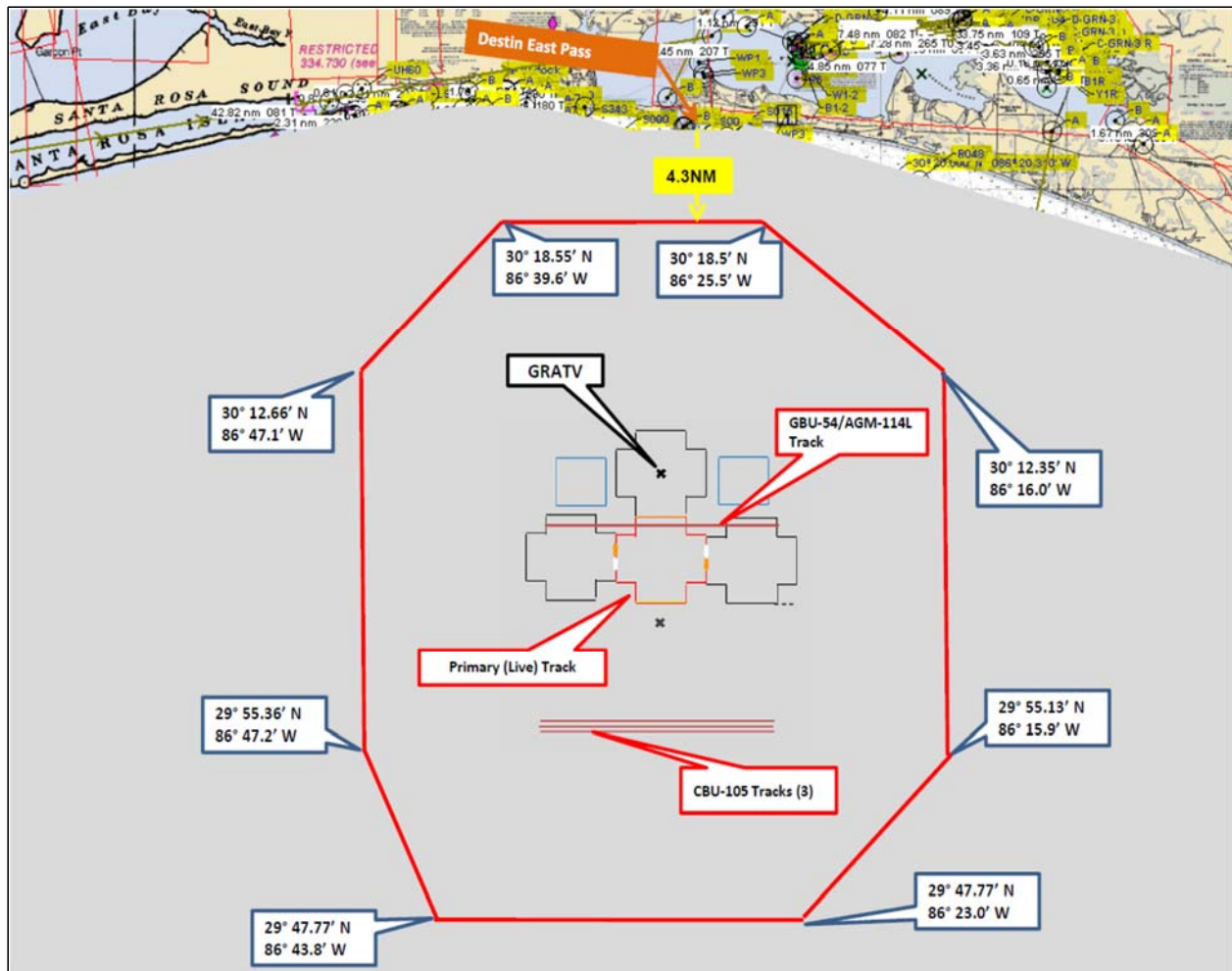


Figure 4-2. Human Safety Box for November 2019 Maritime WSEP Missions

Human safety procedures similar to those described in Section 1.1 were followed. Figure 4-3 shows the map issued to non-participating boats that exited the East Pass as part of the NOTMAR.

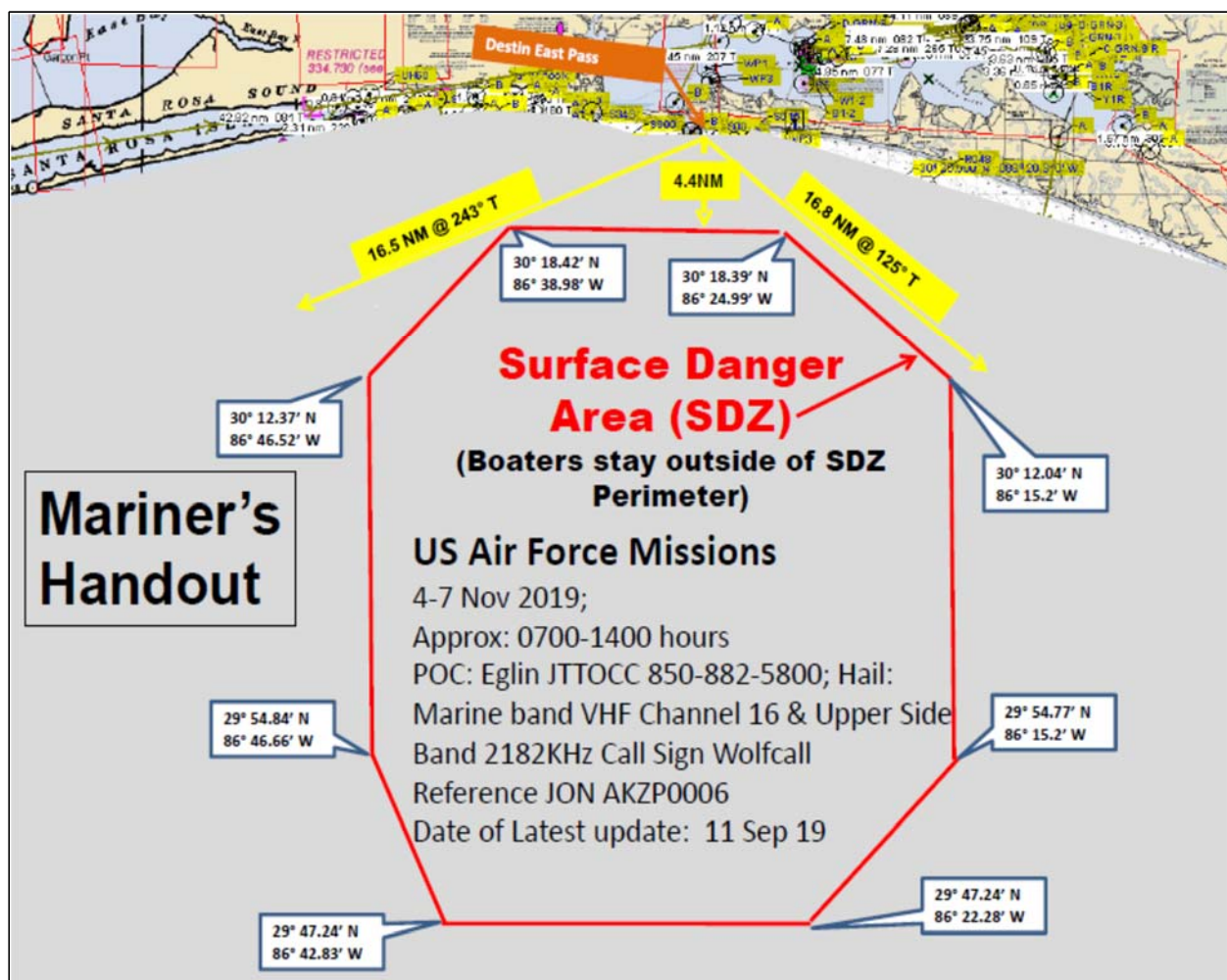


Figure 4-3. Notice to Mariners (NOTMAR) for November 2019 Maritime WSEP Missions

4.2 Mitigation and Monitoring Requirements

Two months before the missions, multiple planning meetings were held with the 86 FWS and other participating offices. Among the items discussed were the list of live weapons and proposed schedule for the week. Eglin NRO used this information to select the most appropriate mission day scenario and associated radius or range to effects for NMFS harassment thresholds for the survey area. Maritime WSEP missions were divided into 3 possible scenarios, based on the number and types of weapons, NEW, and detonation scenarios planned per day. These scenarios from the LOA are shown in Table 4-1.

Table 4-1. Mission Day Scenarios for Maritime WSEP

Mission Day Scenario	Munition	NEW (lbs)	Detonation type	Munitions per day	Mission days/year	Total Munitions/Year
A	GBU-10/-24/-31	945	Subsurface	1	2	2
	GBU-49	300	Surface	2		4
	AGM-158 (JASSM)	240	Surface	2		4

Mission Day Scenario	Munition	NEW (lbs)	Detonation type	Munitions per day	Mission days/year	Total Munitions/Year
	GBU-12/-54/-38/-32 (JDAM or LJDAM)	192	Subsurface	5		10
B	AGM-65 (Maverick)	86	Surface	2	4	8
	GBU-39 (SDB)	37	Surface	1		4
	AGM-114 (Hellfire)	20	Subsurface	5		20
C	AGM-176 (Griffin)	13	Surface	5	2	10
	2.75 Rockets	12	Surface	20		100
	AIM-9X	7.9	Surface	1		2
	PGU-12 30 mm HEI	0.1	Surface	500		1,000

AGM = air-to-ground missile; AIM = air intercept missile; GBU = guided bomb unit; HEI = high explosive incendiary; lbs = pounds; JASSM = Joint Air-to-Surface Standoff Missile; JDAM = Joint Direct Attack Munition; LJDAM = Laser Joint Direct Attack Munition; mm = millimeters; NEW = net explosive weight; PGU = projectile gun unit; SDB = small diameter bomb; WSEP = Weapon Systems Evaluation Program

Table 4-2 shows the ranges to effects for the various thresholds under each of the above scenarios, also taken from the LOA. These distances were used to determine the radius of the area to be monitored during pre- and post-mission surveys.

Table 4-2. Distance in meters to NMFS Harassment Thresholds for Marine Mammals

Mission Day Scenario	Mortality ¹		Level A Harassment				Level B Harassment	
			Slight Lung Injury ²		GI Tract Injury ³	PTS ^{4, 5} (SEL)	TTS ^{4, 6} (SEL)	Behavioral ⁷ (SEL)
	BND	ASD	BND	ASD				
A	427	504	768	886	348	1,039	5,001	8,155
B	107	133	225	266	156	430	2,245	3,959
C	37	47	85	104	83	320	1,128	1,863

¹ Positive impulse metric from the Goertner mortality model equation that uses the mass of a newborn calf of affected species

² Positive impulse metric from the Goertner injury model equation that uses the mass of a newborn calf of affected species

³ Peak pressure metric of 237 dB re 1 μ Pa (unweighted SPL)

⁴ These thresholds use dual criteria, one based on cumulative weighted SEL and one based on peak unweighted SPL. SEL metric was used because the distance was larger than SPL.

⁵ Weighted SEL metric of 185 dB re 1 μ Pa²·s

⁶ Weighted SEL metric of 170 dB re 1 μ Pa²·s

⁷ Weighted SEL metric of 165 dB re 1 μ Pa²·s

ASD = Atlantic spotted dolphin; BND = bottlenose dolphin; dB re 1 μ Pa = decibels referenced to 1 micropascal; dB re 1 μ Pa²·s = decibels referenced to 1 micropascal-squared second; GI = gastrointestinal; NMFS = National Marine Fisheries Service; PTS = permanent threshold shift; SEL = sound exposure level; SPL = sound pressure level; TTS = temporary threshold shift

As planning progressed, ultimately, Hellfire missiles were the only live weapons that would be released and detonated on the water surface. Therefore, Eglin NRO determined that Mission Day Scenario B and the associated ranges to effects would be used to develop the monitoring area and routes for the protected species surveys. The radius distance for Level A Harassment by PTS for Scenario B is 430 m (Table 4-2). The rationale for using Level A/PTS threshold distances to effect for establishing the survey area is provided in the LOA request. Table 4-3 presents the ranges to effect from AGM-114 detonations for the various NMFS acoustic thresholds for sea turtles. It is an excerpt from Table 4-5 of the BA and Table 20 of the BO.

Table 4-3. Distance in Meters to NMFS Acoustic Thresholds for Sea Turtles

Munition	NEW	Detonation Scenario	Mortality	Serious Injury	Impairment	Disturbance	Behavioral Response
AGM-114 (Hellfire)	20 lbs	Surface	92	211	352	692	54,942
		Subsurface	95	213	354	694	55,145

AGM = air-to-ground missile; lbs = pounds; NEW = net explosive weight

Per LOA requirements, Eglin NRO biologists included a buffer around the survey area that extended out to the Level B TTS harassment zone for the corresponding Mission Day Scenario B, which more than doubled the survey area. This buffer accounted for animals that may have swam into the ZOI after surveys were completed. This resulted in a radius equal to 2,200 m (1.19 NM). As stated in Section 4.1.1, the proposed live weapons could detonate anywhere along the Primary Track or the GBU-54/AGM-114L Track. As a result, the survey radius extended from the endpoints of the entire GBU-54/AGM-114L Track with a 0.5 NM buffer. The resulting survey area essentially consisted of a 12-NM x 6-NM (22-km x 11-km) or 49 square NM diamond. Given the size of the survey area, four boats were used to complete the pre-mission surveys (post-mission surveys were not conducted since no live weapons were released): *Sturgeon 1*, *Miss Daisy*, *El Jefe*, and *Sea Eagle*. The approximate survey zones are depicted in Figure 4-4.

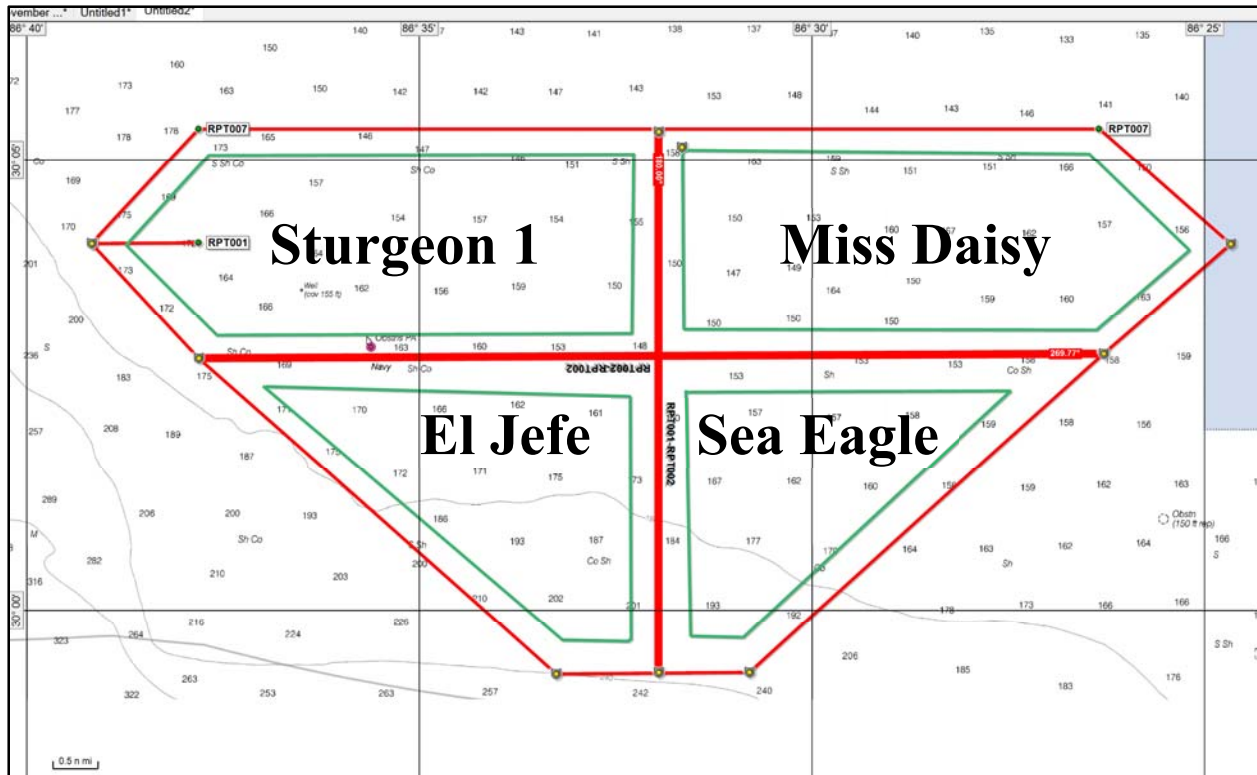


Figure 4-4. Survey Zones for Maritime WSEP Protected Species Surveys

For the duration of Maritime WSEP missions, the *Sturgeon 1* vessel captain would be designated as the Lead Biologist, to whom all sightings were to be reported and documented. It would have been the Lead Biologist's responsibility to document each sighting reported to him by the other

survey vessel captains and provide recommendations to Eglin Tower on whether a mission needed to be delayed or canceled based on either sea state or protected species activity around the detonation sites. After all missions were to be completed the Lead Biologist would provide results from the pre- and post-mission surveys to Eglin NRO.

4.3 Description of Maritime WSEP Missions

Due to inclement weather, limited aircraft availability, and search and rescue efforts for a missing airman, *November WSEP missions had no live weapon releases.*

4.3.1 Monday 4 November 2019

Survey boats left the Destin East Pass between 5:00 – 5:15 AM and transited to their survey start point locations. Weather and sea state conditions were fair with cloudy skies and 1-ft to 2-ft waves inshore of 10 NM. Past 10 NM closer to the GRATV location, waves were between 3-ft and 4-ft. Winds were 12 to 14 knots, and the sea state was at a scale of 2 to 3 with 20% whitecaps. Visibility was near 500 m. No protected species were observed while vessels were en route to survey location nor upon arrival to mission location.

4.3.1.1 Pre-Mission Survey Results

The pre-mission survey began at 6:15 AM and ended at 7:40 AM. Surveys were extended until 7:40 AM because Maritime Ops had a delay in replacing a target vessel. No protected species were observed during the pre-mission survey. Video monitoring from CCF began at 7:30 AM.

4.3.1.2 Mission Results

The aircraft carrying the AGM-114L was grounded around 9:25 AM and live weapon releases were cancelled for the day. The scientist monitoring at CCF spoke with the 96th Operations Support Squadron (96 OSS) and Range Safety to confirm, but it was unclear as to why the aircraft was grounded. No live weapons were released this mission day.

4.3.1.3 Post-Mission Survey Results

Post-Mission surveys were not conducted since no live weapons were released.

4.3.1.4 Take Analysis

No takes occurred on this day's mission since no live weapons were released.

4.3.2 Wednesday 6 November 2019

Survey boats left the Destin East Pass between 5:00 – 5:15 AM and transited to their survey start point locations. Weather and sea state conditions were fair with cloudy to partly cloudy skies and 1-ft to 2-ft waves inshore of 10 NM. Past 10 NM and further offshore, waves were between 4-ft and 5-ft. Winds were 8 to 12 knots initially, increasing to 15 to 20 knots from the NE shifting NNE. The sea state was at a scale of 4 with 50% whitecaps. No protected species were observed while vessels were en route to survey location.

4.3.2.1 Pre-Mission Survey Results

The pre-mission survey began at 6:15 AM and ended at 7:30 AM. Table 4-4 lists all the sightings documented during the survey, sightings believed to be of the same pod of bottlenose dolphins that exited the ZOI.

Table 4-4. Pre-Mission Survey Results from 6 November 2019

#	Time	Vessel	Sighting	Location	Resolution
1	6:18 AM	<i>Sea Eagle</i>	2 bottlenose dolphins	Heading SW at 210° 30° 05.771' N 86° 30.969' W	Continued monitoring this pod.
2	6:30 AM	<i>Sea Eagle</i>	8 bottlenose dolphins	Heading SE at 140° 30° 03.815' N 86° 26.715' W	Monitored this pod – likely the same pod as sighting #1.
2a	6:38 AM	<i>Sturgeon 2</i>	8 bottlenose dolphins – update from sighting #2	Heading SE at 140° 30° 03.793' N 86° 25.190' W	Update from sighting #2 – pod observed leaving survey area and continuing SE away from target area.
7:30 AM		Pre-mission survey ended. All observed protected species confirmed to be outside the ZOI. Video Monitoring began.			

N = north; W = west; SE = Southeast; SW = Southwest; ZOI = zone of influence

4.3.2.2 Mission Results

Live weapons releases were planned for this mission day and pre-mission surveys were completed; however, water ranges were shut down and all live weapons releases canceled due to on-going search and rescue efforts for a missing airman who fell into the water during an unrelated mission the previous day. All survey boats assisted the U.S. Coast Guard and Air Force with search and rescue efforts for the missing airman. No live weapons were released for this mission day.

4.3.2.3 Post-Mission Survey Results

Post-Mission surveys were not conducted since no live weapons were released.

4.3.2.4 Take Analysis

No takes occurred on this day's mission since no live weapons were released.

4.4 WSEP Mission Summary

Due to inclement weather, limited aircraft availability, and search and rescue efforts for a missing airman, November WSEP missions had no live weapon releases. No more water missions were conducted for the remainder of the week. No marine mammal or sea turtle takes occurred resulting from the 2019 Maritime WSEP missions.

5. 413th Flight Test Squadron (413 FLTS)

The 413 FLTS did not conduct any live missions over the EGTR in calendar year 2019.

6. Summary of all EGTR Mission Activities

Table 6-1 below summarizes results from protected species surveys and live weapon releases in the EGTR during calendar year 2019.

Table 6-1. Summary of Survey Results and Live Weapon Releases in the EGTR

Mission Group	Mission Date	Pre-Mission Survey Results		During Mission Survey Results		Live Weapons Releases			Post-Mission Survey Results	
		# MM	# ST	# MM	# ST	Type	NEW	#	# MM	# ST
AFSOC	8/6/19	0	0	0	0	Gunnery	0.1 lbs	300	0	0
	8/9/19	0	0	0	0	Gunnery	4.7 lbs	5	0	0
	8/12/19	0	0	0	0	Gunnery	0.067 lbs	181	0	0
						Gunnery	0.87 lbs	64		
						Gunnery	4.7 lbs	30		
	8/13/19	0	2	0	0	Gunnery	0.35 lbs	15	0	0
	8/22/19	0	0	0	0	Gunnery	0.35 lbs	15	0	0
	8/23/19	0	0	0	0	Gunnery	0.35 lbs	5	0	0
	8/28/19	0	0	0	0	Gunnery	0.067 lbs	100	0	0
						Gunnery	0.87 lbs	64		
						Gunnery	4.7 lbs	4		
9/18/19	0	0	0	0	Gunnery	0.87 lbs	64	0	0	
						4.7 lbs	30			
780 TS	2/14/2019	0	0	0	0	Missile	20 lbs	1	0	0
	2/15/2019	0	0	0	0	No live weapons were released			N/A	N/A
	4/17/2019	0	0	0	0	Bomb	0.4 lbs	2	0	0
						Bomb	22.84 lbs	2		
	4/30/2019	0	0	0	0	Missile	20 lbs	2	0	0
86 FWS	11/6/2019	8	0	0	0	No live weapons were released			0	0
Total # species observed		8	2	0	0				0	0

= number; AFSOC = Air Force Special Operations Command; AGM = air-to-ground missile; FWS = Fighter Weapons Squadron; JAGM = Joint Air-to-Ground Missile; lbs = pounds; MM = marine mammals; N/A = not applicable; NEW = net explosive weight; ST = sea turtles; TS = Test Squadron; Unk. = unknown

The primary species observed during surveys were bottlenose dolphins. Two sea turtles were also observed. All sightings occurred during pre-mission surveys. No protected species were observed during missions or post-mission surveys. For all live missions in the EGTR, the safety box boundaries (the survey areas) extended well-beyond the ZOIs for mortality, serious injury, permanent/temporary injury, impairment, and some behavioral thresholds for marine mammals and sea turtles. Therefore, Eglin NRO believes no marine mammal or sea turtle takes occurred as a result of 2019 EGTR missions.

7. Effectiveness of Mitigation and Monitoring Requirements

The mitigation and monitoring methods authorized by NMFS were successfully implemented in support of EGTTR mission activities. In cases where protected species were observed, Eglin NRO believes all reasonable measures were taken to ensure sighted animals would not be exposed to acoustic levels resulting in mortality or physical injury thresholds during live weapon releases. Continuing to use the same marine species observers for vessel-based surveys has likely increased the reliability of sightings data as boat captains and observers are expected to have improved their surveying techniques over the last five years.

Video monitoring in CCF and in buildings A-5 and C-7 was accomplished for three live mission days, all of which were 780 TS tests. Eglin NRO plans to incorporate video monitoring for all future EGTTR live missions when operationally feasible. Eglin NRO will reach out to AFSOC and the 413 FLTS to ensure the aircrews are using the most updated version of the mission reporting forms for future mission activities. Implementing these improvements in the monitoring requirements will further increase Eglin's effectiveness in protecting marine mammals and sea turtles during live weapon missions in the EGTTR.

8. Protected Species Stranding Reports

As part of Eglin NRO's marine mitigation program, protected marine species strandings are reviewed and analyzed for potential correlation to missions. No marine mammal strandings occurred on Eglin AFB property or were reported to Eglin NRO during calendar year 2019. This discussion will only focus on sea turtle stranding data.

According to the Florida Sea Turtle Stranding and Salvage Network (FLSTSSN) archived stranding data, Okaloosa County has reported an average 20.8 sea turtle strandings per year over the last 10 years (FLSTSSN, 2020). As shown in Figure 8-1, 19 sea turtle strandings (3 from Eglin AFB) were reported in Okaloosa County in 2019, including 6 loggerheads, 7 green, and 6 Kemp's ridley turtles (FLSTSSN, 2020). Data for 2019 show that strandings stayed below the 5- and 10-year averages.

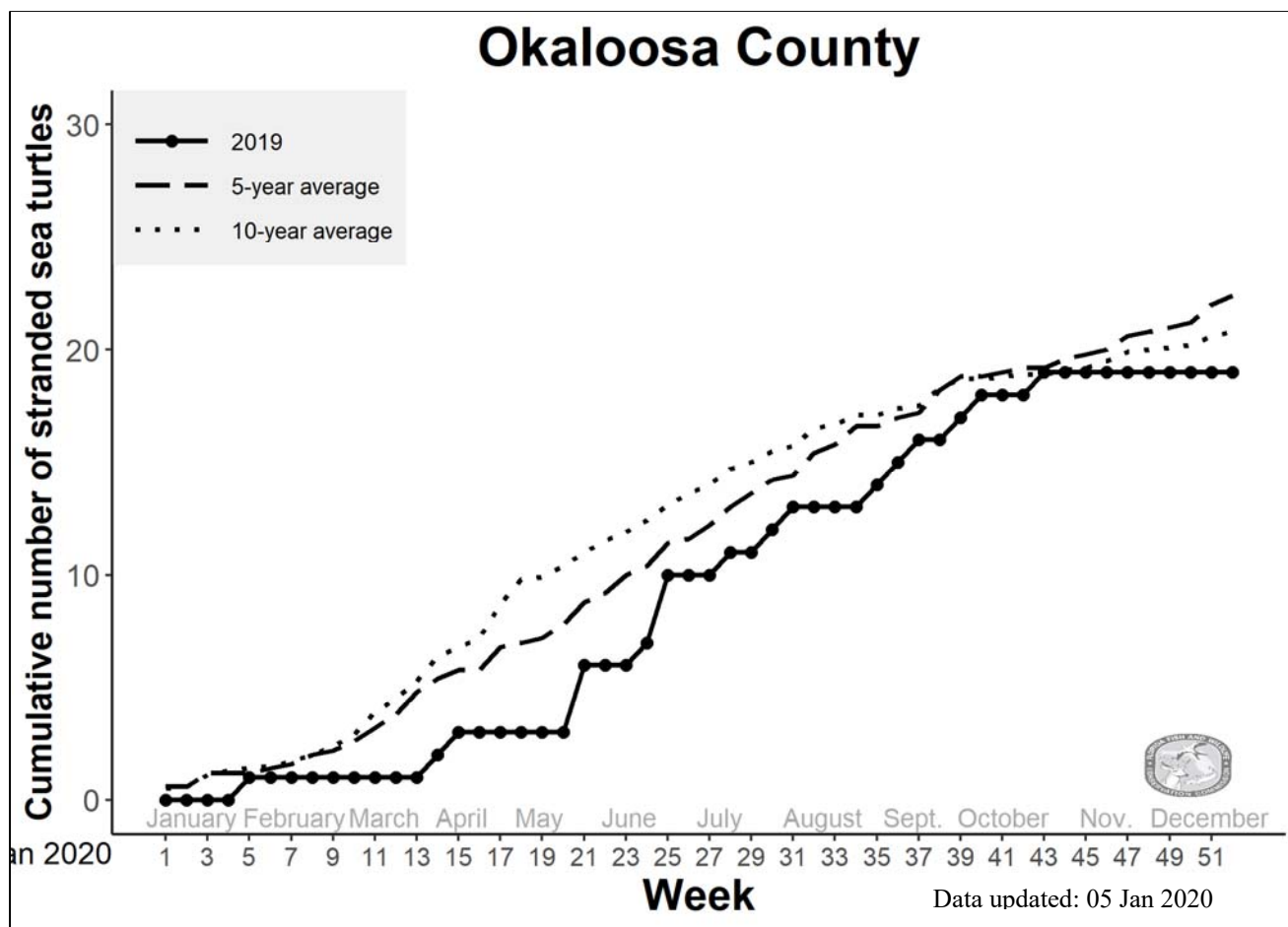


Figure 8-1. Cumulative Numbers of Stranded Sea Turtles in Okaloosa County during 2019 (Ongoing) and the Previous 5-year and 10-year Averages
 Source: (FLSTSSN, 2020)

Specifically for Eglin AFB property in 2019, three turtles were found stranded on Eglin’s property on SRI (Okaloosa County) and no turtles were found stranded on Eglin’s property in Cape San Blas off St. Joseph Bay (Gulf County). These three individuals are included as part of the total strandings for Okaloosa County in 2019. Information on each of these strandings is presented in Table 8-1.

Table 8-1. 2019 Sea Turtle Stranding Records for Eglin AFB

Date	# of Animals	Species	Location Found	Condition of the Animal(s)
5/24/2019	1	Green	Halfway between the 300 ft. tower and A-15 on Eglin AFB restricted beach	Moderately decomposed and missing all flippers. Bite marks to carapace visible.
5/25/2019	1	Kemp’s ridley	0.5 mile west of the 300 ft. tower	Freshly dead with no abnormalities noted.

Date	# of Animals	Species	Location Found	Condition of the Animal(s)
			on Eglin AFB restricted beach	
7/30/2019	1	Green	Shoreline of Choctawhatchee Bay on Eglin AFB property	Boat strike injury to top of carapace observed. No other wounds or abnormalities noted.

The green and Kemp's ridley strandings at the end of May occurred well after the April JAGM Mission. Judging from the freshly dead condition of the turtle, this stranding was not related to EGTTTR live mission activities. The green turtle stranding in July, which occurred prior to the August AFSOC gunnery missions was also not related to EGTTTR live mission activities.

9. Conclusion

No additional impacts to protected species have been reported since the missions were completed on November 6, 2019. Eglin NRO believes this document fulfills the reporting requirements outlined in the LOA and BO, the findings of which indicate Eglin successfully implemented mitigation and monitoring requirements. Additionally, since efforts to implement the PAM efforts were unsuccessful during the November 2019 Maritime WSEP mission, Eglin AFB Natural Resources plans to deploy hydrophones during the upcoming April 2020 Maritime WSEP mission to record sound energy and pressure levels during the planned live weapon releases.

10. References

FLSTSSN. (2020). *Current Information on Stranded Sea Turtles in Florida*. Retrieved January 8, 2020, from Florida Sea Turtle Stranding and Salvage Network: <http://ocean.floridamarine.org/seaturtle/flstssn/cOkaloosa.html>

11. Signatures

2019 Annual Report on EGTR Mission Activities

Final Report

Eglin Air Force Base, Florida

Prepared by:

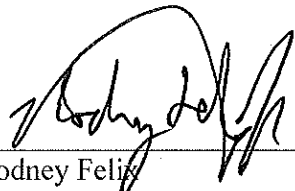


Brail Stephens
Marine Scientist
Eglin Natural Resources/Leidos

2/18/2020

Date

Reviewed by:



Rodney Felix
Endangered Species Biologist
Eglin Natural Resources Office

18 Feb 2020

Date



Justin Johnson
Supervisory Biologist
Eglin Natural Resources Office

18 Feb 2020

Date



Bruce Hagedorn
Chief
Eglin Natural Resources Office

18 Feb 2020

Date

Appendix A

Protected Species Observer Report Forms

PROTECTED SPECIES OBSERVER REPORT FORM

Use a separate form for each mission day

****Complete this section regardless of whether or not protected species are sighted****

Date: 8/6/19	Observer Name: Hamman	Organization: 73SOS
Mission Description: AC-130 Live Fire		
Mission Location: Latitude: _____ Longitude: _____		
# of rounds used (enter for all that apply): 25 mm _____ 40 mm _____ 105 mm Full Up _____ 105 mm Training Round _____ 300 30 mm _____ Other (please specify): _____		
Were any protected species or indicators observed while en route*? Y N		
Arrival Time (Local) at Site: _____ Sea State(see chart below): _____		
Pre-Mission Survey: Start time (Local): 2100 _____ End time (Local): 2115 _____		
Were any protected species or indicators observed*? No _____		
Mission Times: Start time (Local): 2100 _____ End time (Local): 2300 _____		
Were any protected species or indicators observed*? No _____		
Post-Mission Survey: Start time (Local): 2245 _____ End time (Local): 2300 _____		
Were any protected species or indicators observed*? No _____		
If the mission was cancelled due to environmental concerns, please state the reason(s): None		

***If "Yes", complete the following section for each sighting that was observed.**

To report a dead or injured protected animal:

Daytime Missions POC: Rodney Felix: 883-1153 or Brail Stephens: 882-8433

Nighttime Missions POC: Justin Johnson: 978-3251 or Bruce Hagedorn: 902-6004

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources
within 48 hours after completion of the mission.

POC: Brail Stephens: brail.stephens.1.ctr@us.af.mil; 882-8433

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) I abided by all the mitigation requirements and monitoring procedures outlined in Eglin's Letter of Authorization for Air-to-Surface Gunnery Missions in the Eglin Gulf Test and Training Range. 4) All the information on this form is true and accurate to the best of my knowledge. 5) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: HAMMAN.JAMES.A.1186411745

Digitally signed by HAMMAN.JAMES.A.1186411745
Date: 2019.08.07 01:27:21 -0500

Date: 8/6/19

PROTECTED SPECIES OBSERVER REPORT FORM

Use a separate form for each mission day

****Complete this section regardless of whether or not protected species are sighted****

Date: <u>9 AUG</u>	Observer Name: <u>MICHAEL CIFRANIL</u>	Organization: <u>SECOM</u>
Mission Description: <u>1-MASTER RADAR - WATER IMPACT DETECTION</u>		
Mission Location: Latitude: <u>N 30 02.638</u> Longitude: <u>W 086 12.210</u>		
Type and # of Munitions Tested Munition: <u>DGU-44</u> Number: <u>5</u> Munition: _____ Number: _____		
Were any protected species or indicators observed while en route*? <input type="radio"/> Y <input checked="" type="radio"/> N		
Arrival Time (Local) at Site: <u>1440L</u> Sea State(see chart below): Select one <u>1</u>		
Pre-Mission Survey: Start time (Local): <u>1459L</u> End time (Local): <u>2010Z</u>		
Were any protected species or indicators observed*? <input type="radio"/> Y <input checked="" type="radio"/> N		
Mission Times: Start time (Local): <u>201500Z</u> End time (Local): <u>201900Z</u>		
Were any protected species or indicators observed*? <input type="radio"/> Y <input checked="" type="radio"/> N		
Post-Mission Survey: Start time (Local): <u>202030Z</u> End time (Local): <u>202800Z</u>		
Were any protected species or indicators observed*? <input type="radio"/> Y <input checked="" type="radio"/> N		
If the mission was cancelled due to environmental concerns, please state the reason(s): _____		

**If "Yes", complete the following section for each sighting that was observed.*

To report a dead or injured protected animal:
Contact Jeremy Preston at 883-1153 or 978-2731 immediately

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources within 48 hours after completion of the mission.

POC: Amanda Robydek: amanda.robbydek.ctr@us.af.mil; 882-8395

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) All the information on this form is true and accurate to the best of my knowledge. 4) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: _____

Date: 9 AUG 2019

Last updated 9/23/2014

PROTECTED SPECIES OBSERVER REPORT FORM

Use a separate form for each mission day

****Complete this section regardless of whether or not protected species are sighted****

Date: 12 Aug 19	Observer Name: Sheridan	Organization: 4SOS
Mission Description: AC-130 Live Fire		
Mission Location: Latitude: W151A Longitude: _____		
# of rounds used (enter for all that apply): 181 25 mm 64 40 mm 30 105 mm Full Up _____ 105 mm Training Round 30 mm _____ Other (please specify): _____		
Were any protected species or indicators observed while en route*? Y N		
Arrival Time (Local) at Site: _____ Sea State(see chart below): _____		
Pre-Mission Survey: Start time (Local): 1745 End time (Local): 1900		
Were any protected species or indicators observed*? No _____		
Mission Times: Start time (Local): 1800 End time (Local): 1900		
Were any protected species or indicators observed*? No _____		
Post-Mission Survey: Start time (Local): 1855 End time (Local): 1910		
Were any protected species or indicators observed*? No _____		
If the mission was cancelled due to environmental concerns, please state the reason(s): None		

***If "Yes", complete the following section for each sighting that was observed.**

To report a dead or injured protected animal:

Daytime Missions POC: Rodney Felix: 883-1153 or Brail Stephens: 882-8433

Nighttime Missions POC: Justin Johnson: 978-3251 or Bruce Hagedorn: 902-6004

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources
within 48 hours after completion of the mission.

POC: Brail Stephens: brail.stephens.1.ctr@us.af.mil; 882-8433

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) I abided by all the mitigation requirements and monitoring procedures outlined in Eglin's Letter of Authorization for Air-to-Surface Gunnery Missions in the Eglin Gulf Test and Training Range. 4) All the information on this form is true and accurate to the best of my knowledge. 5) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: HAMMAN,JAMES.A.1186411745

Digitally signed by HAMMAN,JAMES.A.1186411745
Date: 2019.08.07 01:27:21 -0500

Date: 12 Aug 19

PROTECTED SPECIES OBSERVER REPORT FORM**Use a separate form for each mission day******Complete this section regardless of whether or not protected species are sighted****

Date: 13 Aug 19	Observer Name: LT McCormack	Organization: 73 SOS
Mission Description: 5887 AC-130J AHEL Vibration Data Collection		
Mission Location: Latitude: N 29.75 Longitude: W 086.10		
Type and # of Munitions Tested Munition: PGU-43 TP Number: 15 Munition: Number:		
Were any protected species or indicators observed while en route? <input checked="" type="radio"/> Y <input type="radio"/> N		
Arrival Time (Local) at Site: 1135 Sea State(see chart below): Select one ^①		
Pre-Mission Survey: Start time (Local): 1140 End time (Local): 1215 Were any protected species or indicators observed? <input checked="" type="radio"/> Y <input type="radio"/> N		
Mission Times: Start time (Local): 1220 End time (Local): 1310 Were any protected species or indicators observed? <input type="radio"/> Y <input checked="" type="radio"/> N		
Post-Mission Survey: Start time (Local): 1310 End time (Local): 1320 Were any protected species or indicators observed? <input type="radio"/> Y <input checked="" type="radio"/> N		
If the mission was cancelled due to environmental concerns, please state the reason(s): N/A		

**If "Yes", complete the following section for each sighting that was observed.*

To report a dead or injured protected animal:
Contact Jeremy Preston at 883-1153 or 978-2731 immediately

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
①	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources within 48 hours after completion of the mission.

POC: Amanda Robydek: amanda.robbydek.ctr@us.af.mil; 882-8395

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) All the information on this form is true and accurate to the best of my knowledge. 4) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: _____



Date: 13 Aug 19

Last updated 9/23/2014

Sighting #	
Time: 1150L	Sea State (see scale on page 1): Select one (1)
Protected Species Indicator Sighted:	
<input type="checkbox"/> Large school(s) of fish	<input type="checkbox"/> Large flock(s) of feeding birds
<input type="checkbox"/> Sargassum mat(s)	<input type="checkbox"/> Large jellyfish aggregation(s)
<input type="checkbox"/> Other (describe):	
Species class sighted:	
<input type="checkbox"/> Large whale	<input type="checkbox"/> Schooling dolphin
<input type="checkbox"/> Undetermined marine mammal	<input checked="" type="checkbox"/> Sea turtle
<input type="checkbox"/> Manatee	
Species name (if known):	
If unknown, provide description: Large turtle	
Estimated number of animals:	
Adult: 2	Young:
Location of animal(s) sighted:	
Latitude: N 29.75	Longitude: W 086.10 Compass Heading:
Mission status at time of observation (check one):	
<input type="checkbox"/> En route <input checked="" type="checkbox"/> Pre-mission survey <input type="checkbox"/> During mission <input type="checkbox"/> Post-mission survey	
Was animal(s) observed in the ZOI at any time? Select one	
Resolution of the sighting:	
<input type="checkbox"/> Animal left the ZOI before the mission began	
<input checked="" type="checkbox"/> Mission was delayed or location changed due to presence of protected species	
<input type="checkbox"/> Mission was delayed or location changed due to other factors (weather, etc.)	
<input type="checkbox"/> Animal observed during the mission, but outside the ZOI	
<input type="checkbox"/> Animal was observed in the ZOI during the mission	
Post-mission survey results:	
If animal(s) was observed during a post-mission survey, describe behavior/condition:	
<input type="checkbox"/> Normal <input type="checkbox"/> Erratic Swimming <input type="checkbox"/> Remained at Surface <input type="checkbox"/> Injured <input type="checkbox"/> Dead	
<input type="checkbox"/> Other:	

Eglin environmental personnel contact information: Page 1

Additional notes:

PROTECTED SPECIES OBSERVER REPORT FORM

Use a separate form for each mission day

****Complete this section regardless of whether or not protected species are sighted****

Date: <u>22 Aug 19</u>		Observer Name: <u>Patrick Pasierb</u>	Organization: <u>417FLTS</u>
Mission Description:		<u>MSN</u>	
<u>AC-130J AH&L Vibration Data Collection</u>		<u>8056</u>	
Mission Location:			
Latitude: <u>N29.72</u>		Longitude: <u>W086.60</u>	
Type and # of Munitions Tested			
Munition: <u>PGU-43 TP</u>		Number: <u>15</u>	
Munition:		Number:	
Were any protected species or indicators observed while en route*? <input type="radio"/> Y <input checked="" type="radio"/> N			
Arrival Time (Local) at Site: <u>1415</u>		Sea State(see chart below): Select one /	
Pre-Mission Survey:			
Start time (Local): <u>1415</u>		End time (Local): <u>1425</u>	
Were any protected species or indicators observed*? <input type="radio"/> Y <input checked="" type="radio"/> N			
Mission Times:			
Start time (Local): <u>1430</u>		End time (Local): <u>1640</u>	
Were any protected species or indicators observed*? <input type="radio"/> Y <input checked="" type="radio"/> N			
Post-Mission Survey:			
Start time (Local): <u>1645</u>		End time (Local): <u>1650</u>	
Were any protected species or indicators observed*? <input type="radio"/> Y <input checked="" type="radio"/> N			
If the mission was cancelled due to environmental concerns, please state the reason(s): <u>N/A</u>			

*If "Yes", complete the following section for each sighting that was observed.

To report a dead or injured protected animal:
Contact Jeremy Preston at 883-1153 or 978-2731 immediately

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
<u>(1)</u>	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources within 48 hours after completion of the mission.

POC: Amanda Robydek: amanda.robbydek.ctr@us.af.mil; 882-8395

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) All the information on this form is true and accurate to the best of my knowledge. 4) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: 

Date: 22 Aug 19

Last updated 9/23/2014

PROTECTED SPECIES OBSERVER REPORT FORM

Use a separate form for each mission day

Complete this section regardless of whether or not protected species are sighted

Date: 8/23/2019	Observer Name: Erik K. Hurrell	Organization: USSocom Det 1
Mission Description: AHEL Vibration Data Collection		
Mission Location:		
Latitude: N 29.45 478	Longitude: W 086 12 311	
Type and # of Munitions Tested		
Munition: PGU 43 TP	Number: 5	
Munition:	Number:	
Were any protected species or indicators observed while en route? <input type="radio"/> Y <input checked="" type="radio"/> N		
Arrival Time (Local) at Site: 1649	Sea State (see chart below): Select one	
Pre-Mission Survey:		
Start time (Local): 1649	End time (Local): 1700	
Were any protected species or indicators observed? <input type="radio"/> Y <input checked="" type="radio"/> N		
Mission Times:		
Start time (Local): 1700	End time (Local): 1722	
Were any protected species or indicators observed? <input type="radio"/> Y <input checked="" type="radio"/> N		
Post-Mission Survey:		
Start time (Local): 1726	End time (Local): 1736	
Were any protected species or indicators observed? <input type="radio"/> Y <input checked="" type="radio"/> N		
If the mission was cancelled due to environmental concerns, please state the reason(s):		

If "Yes", complete the following section for each sighting that was observed

To report a dead or injured protected animal:

Contact Jeremy Preston at 883-1153 or 978-2731 immediately

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources within 48 hours after completion of the mission.

POC: Amanda Robydek: amanda.robbydek.ctr@us.af.mil; 882-8395

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) All the information on this form is true and accurate to the best of my knowledge. 4) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: _____

Date: 26 Aug 2019

Last updated 9/23/2014

PROTECTED SPECIES OBSERVER REPORT FORM

Use a separate form for each mission day

****Complete this section regardless of whether or not protected species are sighted****

Date: 28 Aug 19		Observer Name: Capt Katie Tiedemanr		Organization: 4 SOS	
Mission Description: W-151 A1/A3 Training Mission					
Mission Location: Latitude: N30 02.00 Longitude: W86.35					
# of rounds used (enter for all that apply): 100 25 mm 64 40 mm 4 105 mm Full Up 105 mm Training Round 30 mm Other (please specify):					
Were any protected species or indicators observed while en route*? Y N					
Arrival Time (Local) at Site:			Sea State(see chart below):		
Pre-Mission Survey: Start time (Local): 1700 End time (Local): 1715					
Were any protected species or indicators observed*? No					
Mission Times: Start time (Local): 1715 End time (Local): 1830					
Were any protected species or indicators observed*? No					
Post-Mission Survey: Start time (Local): 1830 End time (Local): 1845					
Were any protected species or indicators observed*? No					
If the mission was cancelled due to environmental concerns, please state the reason(s): N/A					

***If "Yes", complete the following section for each sighting that was observed.**

To report a dead or injured protected animal:

Daytime Missions POC: Rodney Felix: 883-1153 or Brail Stephens: 882-8433

Nighttime Missions POC: Justin Johnson: 978-3251 or Bruce Hagedorn: 902-6004

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources
within 48 hours after completion of the mission.

POC: Brail Stephens: brail.stephens.1.ctr@us.af.mil; 882-8433

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) I abided by all the mitigation requirements and monitoring procedures outlined in Eglin's Letter of Authorization for Air-to-Surface Gunnery Missions in the Eglin Gulf Test and Training Range. 4) All the information on this form is true and accurate to the best of my knowledge. 5) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: TIEDEMANN.KATIE.LYNN.1385304095 Digitally signed by TIEDEMANN.KATIE.LYNN.1385304095
Date: 2019.08.29 14:41:23 -0500

Date: 28 Aug 19

PROTECTED SPECIES OBSERVER REPORT FORM

Use a separate form for each mission day

****Complete this section regardless of whether or not protected species are sighted****

Date: 9/18/19	Observer Name: Capt Murchison	Organization: 4 SOS
Mission Description: W-151 Live Fire		
Mission Location: Latitude: N30 05.800 Longitude: W086 21.900		
# of rounds used (enter for all that apply): 25 mm 64 40 mm 30 105 mm Full Up 105 mm Training Round 30 mm Other (please specify):		
Were any protected species or indicators observed while en route*? Y N		
Arrival Time (Local) at Site: Sea State(see chart below):		
Pre-Mission Survey: Start time (Local): 1515 End time (Local): 1545		
Were any protected species or indicators observed*? No		
Mission Times: Start time (Local): 1545 End time (Local): 1700		
Were any protected species or indicators observed*? No		
Post-Mission Survey: Start time (Local): 1700 End time (Local): 1720		
Were any protected species or indicators observed*? No		
If the mission was cancelled due to environmental concerns, please state the reason(s): N/A		

***If "Yes", complete the following section for each sighting that was observed.**

To report a dead or injured protected animal:

Daytime Missions POC: Rodney Felix: 883-1153 or Brail Stephens: 882-8433

Nighttime Missions POC: Justin Johnson: 978-3251 or Bruce Hagedorn: 902-6004

Sea State Scale for Marine Mammal and Sea Turtle Observation

Scale Number	Sea Conditions
0	Flat calm, no waves or ripples
1	Small wavelets, few if any whitecaps
2	Whitecaps on 0-33% of surface; 0.3 to 0.6 m (1 to 2 feet) waves
3	Whitecaps on 33-50% of surface; 0.6 to 0.9 m (2 to 3 feet) waves
4	Whitecaps on greater than 50% of surface; greater than 0.9 m (3 feet) waves

Sign and submit this completed form and sighting information to Eglin Natural Resources
within 48 hours after completion of the mission.

POC: Brail Stephens: brail.stephens.1.ctr@us.af.mil; 882-8433

By electronically signing this form, I certify that: 1) I have successfully completed the Marine Species Observer Training course within that last year. 2) I served as the Protected Species Observer for the mission described above. 3) I abided by all the mitigation requirements and monitoring procedures outlined in Eglin's Letter of Authorization for Air-to-Surface Gunnery Missions in the Eglin Gulf Test and Training Range. 4) All the information on this form is true and accurate to the best of my knowledge. 5) I agree to follow up with Eglin Natural Resources on any questions or requests for additional information.

Signature: MURCHISON.RYAN.MATTHEW.1283521628 Digitally signed by MURCHISON.RYAN.MATTHEW.1283521628
Date: 2019.09.18 19:39:50 -0500

Date: 9/18/19