3.12 Socioeconomic Resources and Environmental Justice

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Mariana Islands Training and Testing

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3.12 Socioeconomic Resources and Environmental Justice

The purpose of this section is to supplement the analysis of impacts on socioeconomic resources and environmental justice presented in the 2015 Mariana Islands Training and Testing (MITT) Final Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) with new information relevant to proposed changes in training and testing activities conducted at sea and on Farallon de Medinilla (FDM). Information presented in the 2015 MITT Final EIS/OEIS that remains valid is noted as such and referenced in the appropriate sections. New information made available since the publication of the 2015 MITT Final EIS/OEIS is included below to better understand potential stressors and impacts on socioeconomic resources and environmental justice resulting from training and testing activities. Comments received from the public during scoping related to socioeconomic resources and environmental justice are addressed in Section 3.12.3 (Public Scoping Comments).

Section 3.12 (Socioeconomic Resources) in the 2015 MITT Final EIS/OEIS analyzed subsistence fishing as a socioeconomic resource but did not identify it as an environmental justice issue. This section supplements the analysis of subsistence fishing by expanding the discussion to include other traditional fishing practices and identifying these practices as an environmental justice issue as well as a socioeconomic resource. For the purposes of this analysis, traditional fishing practices are defined by the motivation for the fishing trip and include subsistence, cultural customs, communal sharing, and non-commercial financial benefit (e.g., selling the catch to cover the costs of the fishing trip). These traditional practices, which are longstanding and defining characteristics for many in the local communities on Guam and in the Commonwealth of the Northern Mariana Islands (CNMI), are analyzed separately from recreational and commercial fishing in this section.

3.12.1 Affected Environment

The socioeconomic resources and environmental justice issues (i.e., traditional fishing practices) analyzed in this Supplemental EIS (SEIS)/OEIS are the same as the resources identified and analyzed in the 2015 MITT Final EIS/OEIS. The training and testing activities described in Chapter 2 (Description of Proposed Action and Alternatives) of this SEIS/OEIS are generally consistent with the training and testing activities analyzed in the 2015 MITT Final EIS/OEIS and are representative of activities that the Department of Defense (DoD) has been conducting in the MITT Study Area for decades.

The concerns over socioeconomic resources and how they may be impacted by the proposed training and testing activities are similar to those as previously described in the 2015 MITT Final EIS/OEIS. The United States (U.S.) Navy's operating procedures to prevent or lessen impacts on local socioeconomic resources, as described in the 2015 MITT Final EIS/OEIS, remain applicable and will continue to be implemented.

As described in detail in the 2015 MITT Final EIS/OEIS, the socioeconomic analysis evaluated how elements of the human environment might be affected by ongoing and proposed training and testing activities in the Study Area. The Navy identified four broad socioeconomic elements based on their association with human activities and livelihoods in the Study Area:

- Commercial transportation and shipping
- Commercial and recreational fishing
- Traditional fishing practices
- Tourism

Each of these resources is an aspect of the human environment that involves economics (e.g., employment, income, or revenue) and social conditions (e.g., enjoyment and quality of life) associated with the marine environment in the Study Area. These four elements were chosen as the focus of the analysis in this section because of their importance to the local economy and the way of life on Guam and the CNMI and the potential for these elements to be impacted by the proposed training and testing activities.

Data and information from government technical documents and reports, scientific journals, and the Navy's marine resources database of publications were reviewed to assess any changes in the socioeconomic environment from conditions described in the 2015 MITT Final EIS/OEIS. The Navy concluded that socioeconomic resources in the marine environment have not changed appreciably since the year 2015.

The growth in Guam's gross domestic product (GDP) has fallen steadily from 2 percent in the year 2012 to less than 0.5 percent in the year 2016; while growth has remained positive, it has underperformed compared with U.S. GDP growth, which saw a 1.5 percent increase in the year 2016 (Hovland et al., 2017a). Increased spending by tourists and in the retail sector was offset by decreases in the construction sector following completion of a large hospital and luxury hotel (Hovland et al., 2017a). Government spending also decreased with the completion of the Guam Port Authority's improvement plan and fewer DoD construction contracts. However, contracts for construction projects and infrastructure improvements are being awarded to prepare for the relocation of approximately 5,000 Marines and 3,500 dependents from Okinawa, Japan to Guam, which is expected to boost the economy over the next several years (Guam Economic Development Authority, 2018; U.S. Department of the Navy, 2015).

The Guam Economic Development Authority estimates that over 12,800 military personnel and their dependents reside on the island. This includes all military and dependents, including personnel at Naval Base Guam and Andersen Air Force Base, not just those who support the proposed training and testing activities (Guam Economic Development Authority, 2018). In the 2010 U.S. census, the population of Guam was 159,358 (U.S. Census Bureau, 2018a), and the Central Intelligence Agency World Factbook estimated that the population had grown to 167,358 by the year 2017 (U.S. Central Intelligence Agency, 2018a). Based on these estimates, military personnel and their dependents make up approximately 8 percent of the population of Guam. For comparison, the population on Guam grew by just 5 percent from the years 2010 through 2017. In addition to the substantial economic contribution that 8 percent of the population makes to the Guam economy through spending, taxes (e.g., sales tax), and rental or mortgage payments, the DoD continues to fund infrastructure development projects, and the funding is expected to accelerate with the relocation of the Marines. During the last decade, DoD construction contracts have totaled over $2 billion and have recently averaged nearly $240 million annually. The fiscal year (FY) 2017 National Defense Authorization Act appropriated over $253 million for military construction on Guam (Guam Economic Development Authority, 2018).

The GDP for the CNMI increased by over 28 percent from the years 2015 through 2016, driven primarily by increases in tourism-related spending (Hovland et al., 2017b). Steady GDP growth from the years 2012 through 2015 preceded the large increase in the year 2016 and represents a positive trend in the economy. However, GDP growth from the year 2014 to 2015 was a comparatively low 3.8 percent, and it remains to be seen if GDP growth will continue at a high rate in the coming years. In the year 2016, the number of tourists visiting the CNMI, particularly from Korea and China, increased by 10 percent.

Private investment increased by over 60 percent, reflecting investment in the gambling industry and construction of the large casino in Garapan as well as smaller hotels on Saipan (Hovland et al., 2017b).

In the 2010 U.S. census, the population of the CNMI was 53,883 (U.S. Census Bureau, 2018b), and the Central Intelligence Agency World Factbook estimated that the population had declined to 52,263 in the year 2017 (U.S. Central Intelligence Agency, 2018b). Of the 38,679 residents of the CNMI over the age of 16, only 19 reported being in the military in the 2010 U.S. census, indicating that the economic contribution of military personnel and their dependents is not a substantial portion of the CNMI economy (U.S. Census Bureau, 2018c). The Navy has, for the past 5 to 10 years, had seven vessels assigned to Saipan, which provides substantial funding to the CNMI economy through fuel costs, port fees, and maintenance costs. Five of the vessels are "large, medium speed, roll on/roll off" (or LMSR) vessels and the other two are 2nd Lt. John P. Bobo "BOBO" class vessels. The LMSR vessels transport tracked military vehicles (e.g., tanks) and equipment, and the BOBO class vessels are container and-roll on/roll-off vessels used to transport cargo and ammunition. The annual budget for the five LMSR vessels is approximately $41.5 million, and the annual budget for the two BOBO vessels is approximately $9.5 million. Not every dollar enters directly into the CNMI economy; however, the port fees alone are $900 thousand for each of the seven vessels, totaling $6.3 million annually. Having the seven vessels assigned to Saipan adds millions of dollars into the CNMI economy annually.

3.12.1.1 Commercial Transportation and Shipping

The military conducts training and testing activities in operating areas well away from commercially used waterways and inside special use airspace. Refer to Figure 3.12-1 and Figure 3.12-3 of the 2015 MITT Final EIS/OEIS for a depiction of commercial waterways and air routes in proximity to military operating areas and special use airspace in the Study Area. Scheduled training and testing activities are published in Notices to Mariners (NOTMARs) issued by the U.S. Coast Guard and Notices to Airmen (NOTAMs) issued by the Federal Aviation Administration (FAA). These notices are accessible to the public and intended to limit or prevent conflicts between military and non-military uses of shared sea space and airspace.

Following a review of recent literature, including government technical documents and reports, scientific journals, and the Navy's marine resources database of publications, the information presented on commercial transportation and shipping, as described in the 2015 MITT Final EIS/OEIS, has not appreciably changed and remains valid.

3.12.1.1.1 Ocean Traffic

Ocean traffic is the transit of commercial, private, or military vessels at sea, including submarines. In most cases, the factors that govern shipping or boating traffic include the following: adequate depth of water, weather conditions (primarily affecting recreational vessels), availability of fish (affecting the location of commercial and recreational fishing vessels), and water temperature. Higher water temperatures are correlated with an increase in recreational boat traffic, jet skis, and scuba diving activities. Most shipping lanes are located close to the coast, but those that are trans-oceanic start and end to the northwest of Guam.

Areas of surface water within the Study Area are designated as danger zones and restricted areas as described in Code of Federal Regulations (CFR) Title 33 (Navigation and Navigable Waters), Part 334 (Danger Zone and Restricted Area Regulations) and established by the U.S. Army Corps of Engineers. A detailed discussion of danger zones and restricted areas located in the Study Area is provided in Chapter 2 (Description of Proposed Action and Alternatives), Figure 2.7-1 and Table 2.7-1, in the 2015 MITT Final

EIS/OEIS. No changes in danger zones and restricted areas in the Study Area have been codified in the Federal Register since the publication of the 2015 MITT Final EIS/OEIS.

3.12.1.1.1.1 Guam

Guam has one commercial port, which is located in Apra Harbor. The Port of Guam is the largest U.S. deepwater port in the Western Pacific, handling over 2 million tons of cargo and over 102,000 shipping containers in FY 2016 (Port Authority of Guam, 2017). The average tonnage handled by the port in FY 2015 and FY 2016 was approximately 16 percent greater than the average of the four previous years, and the average number of shipping containers processed by the port in FY 2015 and FY 2016 was 2.6 percent greater than the average of the four previous years (Port Authority of Guam, 2017). Based on these data, trends in commercial transportation and shipping in Guam appear to be steady and somewhat positive, and the analysis presented in the 2015 MITT Final EIS/OEIS remains valid.

3.12.1.1.1.2 Commonwealth of the Northern Mariana Islands

There are three ports within the CNMI: the Port of Rota, the Port of Tinian, and the Port of Saipan. The Port of Rota, or Rota West Harbor, is located on the southwestern tip of the island of Rota. The port includes a jetty with a pierside water depth of 6–10 feet (ft.), which limits the size of vessels that can access the pier. The Port of Rota is mainly used by ferry boats transporting tourists and residents from Tinian. The Port of Tinian is a small port with three finger piers and a small boat ramp. Pierside water depth ranges from 26–30 ft., allowing relatively large vessels to dock. The Port of Saipan is the largest and most advanced of the three CNMI ports, but is nevertheless described as a small seaport by the World Port Source (World Port Source, 2012). The vast majority of cargo transported to the CNMI comes through the Port of Saipan (Commonwealth Ports Authority, 2017). The Port of Saipan has a cargo terminal and an oil terminal with pierside depths up to 25 ft. (World Port Source, 2012). Port facilities are capable of handling loads over 100 tons, and in FY 2016 the port transferred over 560,441 tons of cargo (Commonwealth Ports Authority, 2017). This represents a 36 percent increase over the FY 2015 total and the second straight year of increases (FY 2015 tonnage was 8 percent greater than FY 2014). For all three seaports combined, total tonnage processed in FY 2016 was 581,028 tons, which is a 34 percent increase over the FY 2015 total (Commonwealth Ports Authority, 2017). Based on these data, trends in commercial transportation and shipping in the CNMI have been positive from the years 2014 through 2017, and the analysis presented in the 2015 MITT Final EIS/OEIS remains valid.

3.12.1.1.1.3 Transit Corridor

Major commercial shipping vessels use the shipping lanes for transporting goods between Hawaii, the continental United States, and Asia. However, there are no direct routes between Guam and the United States; stops are made in Asia (usually Japan or Korea) before continuing on to either Hawaii or the continental United States (see Figure 3.12-1 in the 2015 MITT Final EIS/OEIS). Vessels using shipping lanes are outside of military training areas and are required to follow U.S. Coast Guard maritime regulations. Based on available information, overseas commercial shipping traffic potentially passing through the transit corridor, as described in the 2015 MITT Final EIS/OEIS, has not appreciably changed and remains valid.

3.12.1.1.2 Air Traffic

Air traffic refers to movements of aircraft through airspace. Safety and security factors dictate that use of airspace and control of air traffic be closely regulated. Accordingly, regulations applicable to all aircraft are promulgated by the FAA to define permissible uses of designated airspace and to control that use. These regulations are intended to accommodate the various categories of aviation, whether military, commercial, or general aviation.

Special use airspace is a type of airspace used primarily for military operations. Special use airspace has defined dimensions where flight and other activities are confined because of their nature and the need to restrict or prohibit non-participating aircraft for safety reasons. The majority of special use airspace may be used for commercial or general aviation when not reserved for military activities.

One type of special use airspace of particular relevance to the Study Area is a warning area, which is defined in 14 CFR Part 1 as follows:

> "A warning area is airspace of defined dimensions, extending from 3 nautical miles (NM) outward from the coast of the United States that contains activity that may be hazardous to non-participating aircraft. The purpose of such warning areas is to warn non-participating pilots of the potential danger. A warning area may be located over domestic or international waters or both."

On March 13, 2017, the FAA issued a final rule on the modification of the restricted area surrounding FDM (*82 Federal Register 13389*). The modification expands restricted airspace R-7201, which extends 3 NM offshore, by designating a new area, R-7201A, that surrounds R-7201. The new restricted area airspace, R-7201A, encompasses the airspace between a 3 NM radius and a 12 NM radius around FDM. The new airspace R-7201A became effective on June 22, 2017, and was codified in 14 CFR Part 73. While restricted area airspace R-7201A had not been designated by the FAA prior to completion of the 2015 MITT Final EIS/OEIS, the Navy had requested the airspace and analyzed potential impacts on socioeconomic resources in the 2015 MITT Final EIS/OEIS in anticipation that R-7201A would be approved and designated. For details and figures describing special use airspace in the Study Area, refer to Chapter 2 (Description of Proposed Action and Alternatives).

3.12.1.1.2.1 Guam

Guam International Air Terminal is the only civilian air transportation facility on Guam. The airport is FAA certified and operated by Guam International Airport Authority, a public corporation and autonomous agency of the Government of Guam. Guam International Air Terminal contains two runways and facilities that were part of the now-closed Naval Air Station Agana. Eight major airlines operate out of Guam International Air Terminal, making it a hub of air transportation for Micronesia. Military aircraft originating from Guam most often transit to one of the three warning areas located south of Guam (Figure 2.1-2).

From FY 2014 through FY 2016, the number of passengers arriving at Guam International Airport increased from approximately 1.34 million to 1.51 million; nearly half originated from Japan (Guam Visitors Bureau, 2017). This represents an increase of over 12 percent, a trend that is expected to continue.

Based on the available information, air traffic on Guam, as described in the 2015 MITT Final EIS/OEIS, has not appreciably changed and remains valid.

3.12.1.1.2.2 Commonwealth of the Northern Mariana Islands

Saipan International Airport is the largest commercial airport in the CNMI and the main gateway for commercial air traffic into the CNMI (Commonwealth Ports Authority, 2005). The airport has an 8,700 ft. runway with adjacent taxiways and can accommodate wide-body aircraft. Direct flights are available from major cities in Japan, Korea, China, and Guam. A commuter terminal services the islands of Tinian and Rota. Star Mariana Air offers 3 outbound and return flights between Rota and Saipan per day, and 12 outbound and return flights between Saipan and Tinian per day (Star Mariana Air, 2018). Since the completion of the 2015 MITT Final EIS/OEIS, Star Mariana Air opened air service between Rota and Guam, a service made possible by the opening of the light aircraft commuter facility at Guam International Airport (Daleno, 2015).

All commercial flights to Tinian fly into West Tinian Airport. The airport has one runway that is 8,600 ft. by 150 ft. The airport is equipped with a navigational light system for nighttime operations but has no control tower or additional navigational aids. Rota International Airport has a 6,000 ft. runway capable of handling Boeing 757 or 727 aircraft, but with load restrictions. Tinian and Rota airports primarily support inter-island flights between Tinian, Saipan, Rota, and Guam. All three CNMI airports are FAA certified.

From FY 2014 through FY 2016, the number of passengers departing from CNMI airports increased from 542,744 to 605,952, an increase of over 11 percent (Commonwealth Ports Authority, 2017). The vast majority (over 93 percent) departed from Saipan International Airport. Arrivals increased from 493,851 to 542,126 passengers (nearly 10 percent) over that same timeframe. Airport traffic is forecast to continue to increase with the addition of new airlines providing air service to and from Saipan International Airport (Commonwealth Ports Authority, 2017).

Training and testing activities are conducted at commercial airports, with appropriate planning and coordination with the local port authorities and the FAA. For example, on Tinian, the military conducts aviation training in the military lease area by delivering personnel and cargo to maneuver areas, and providing various support functions to forces already on the ground.

Airspace and sea space may be restricted around FDM. When necessary, the Navy requests that the U.S. Coast Guard issue NOTMARs and that the FAA issues NOTAMs advising the public of potentially hazardous activities occurring in the airspace and sea space surrounding FDM, which may include sea space out to 12 NM from FDM, depending on the nature of the training and testing activities being conducted.

Based on the available information, air traffic and associated activities occurring over islands and sea space in the CNMI, as described in the 2015 MITT Final EIS/OEIS, has not appreciably changed and remains valid.

3.12.1.1.2.3 Transit Corridor

Commercial air routes controlled by the FAA may overlay a portion of the MITT transit corridor. Commercial aircraft typically fly above 30,000 ft. in this area, and would have no interaction with aircraft conducting training and testing activities, which occur within special use airspace (e.g., warning areas) that have minimal overlap with the transit corridor. Air traffic routes for commercial and general aviation flights departing and arriving at Guam International Air Terminal and Saipan International Airport are established such that overlap with military aircraft activities would be avoided.

3.12.1.2 Commercial and Recreational Fishing

Both the CNMI and Guam are categorized as "fishing communities" by the Western Pacific Regional Fishery Management Council. This designation is based on the portion of the population that is dependent upon fishing for subsistence; the economic importance of fishery resources to the islands; and the geographic, demographic, and cultural attributes of the communities (Western Pacific Regional Fishery Management Council, 2009). Fishing is an integral part of the culture and way of life in the CNMI and Guam. Most fishers do not fish exclusively for commercial, recreational, or subsistence benefit but rather for some combination of the three (Hospital & Beavers, 2012; Hospital & Beavers, 2014; Tibbats & Flores, 2012).

Commercial fishing takes place throughout the Study Area from nearshore waters adjacent to Guam and the CNMI, offshore banks, and pelagic waters. Sportfishing peaks in summer (June through August) when popular sport fish, including blue marlin and yellowfin tuna, are most abundant. Skipjack tuna are present year round, but are most abundant in summer.

3.12.1.2.1 Guam

Commercial and recreational fishing on Guam is typically divided into three types: bottom fishing, coral reef fishing, and pelagic fishing. A 2011 survey of 147 small boat fishers on Guam revealed the traditional and cultural importance of fishing to the people of Guam. Fishers responding to the survey reported having fished from boats for an average of 20 years (Hospital & Beavers, 2012). Although 70 percent of fishers reported selling a portion (on average 24 percent) of their catch, the motivation was not to supplement their income, but mainly to defray some of the costs associated with fishing trips (e.g., fuel costs). Even though fishing is no longer the primary source of income for many fishers, it is an important part of the social and cultural history of the people of Guam, and it remains a vital part of local communities. This point is illustrated by the manner in which fishers distribute their catch. Respondents to the survey (Hospital & Beavers, 2012) reported consuming 29 percent of their catch at home, giving away 42 percent of their catch, and selling 24 percent of their catch. The remaining balance was either released or used to barter for other goods. The survey also noted the importance of fish-aggregating devices to small boat fishers. Ninety-six percent of fishers reported having fished at a device during the previous 12 months and on over half of all fishing trips (Hospital & Beavers, 2012).

More information on fishing practices on Guam, including gear types, target species, charter fishing, commonly used harbors and marinas, and popular fishing sites, is presented in Section 3.12 (Socioeconomic Resources) of the 2015 MITT Final EIS/OEIS.

Commercial fisheries landings for all species from the years 2005 through 2009 were presented in Section 3.12 (Socioeconomic Resources) of the 2015 MITT Final EIS/OEIS (see Table 3.12-2). Since 2010, total fisheries landings (in pounds of fish) and values (dollars) have steadily decreased (Figure 3.12-1). The price per pound of commercial landings has also decreased from a recent high of $2.55 per pound in the year 2011 to $2.39 per pound in the year 2015 (Pacific Islands Fisheries Science Center, 2016b).

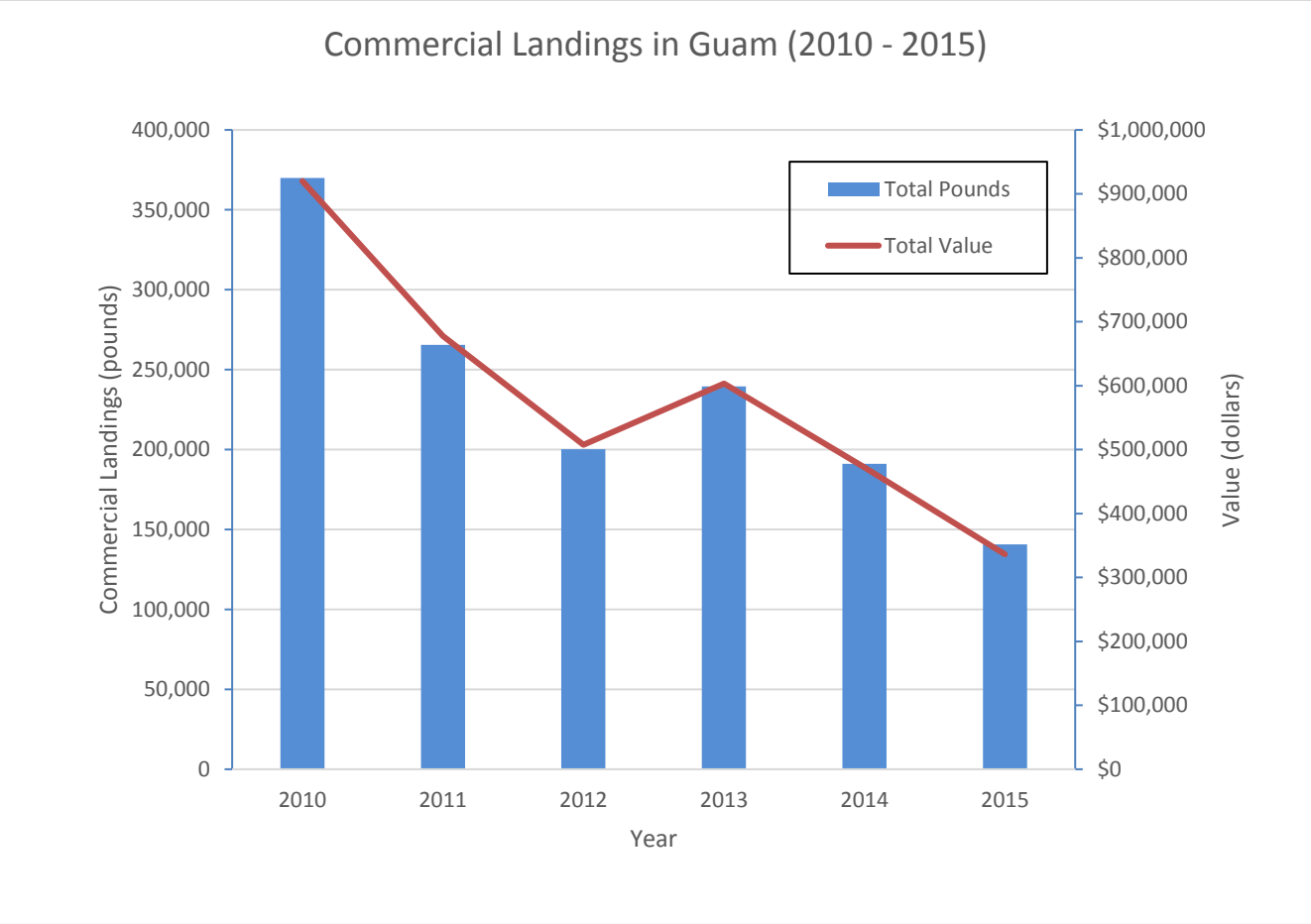

Figure 3.12-1: Commercial Fisheries Landings in Guam from the Years 2010 through 2015

The declining trend in fisheries landings is consistent with the results presented by Weijerman et al. (2016), which documented a decline of over 60 percent in the annual catch of reef fish around Guam between the years 1985 and 2012. The declining catch was consistent with a decline in reef fish biomass around the island. Similar declines in reef fish fisheries have been reported for other regions in Micronesia (Cuetos-Bueno & Houk, 2018). Rather than a single cause, it appears that interconnected economic, social, and environmental factors are combining to exert pressure on remote island fisheries. For example, on the economic front, a growing demand for fresh fish worldwide has driven the development of technology to enable the transportation of fresh fish from more remote areas, including islands in Micronesia, which were not previously commercially viable. Expanding the commercial market to include these remote island fisheries has increased commercial fishing in these remote locations to the point of becoming unsustainable (Cuetos-Bueno & Houk, 2018).

3.12.1.2.2 Commonwealth of the Northern Mariana Islands

Similar to Guam, fishing in the CNMI is performed for commercial and recreational purposes as well as for subsistence. Hospital and Beavers (2014) surveyed 112 small boat fishers from Saipan, Tinian, and Rota. Based on the reported information, the researchers were able to characterize fishing practices in the CNMI by analyzing the level of fishing activity, participation in commercial markets, trip costs and other fishing-related expenditures, the social and cultural importance of fishing, fishing as a means of

subsistence, and attitudes and perceptions of fishing conditions and fisheries management. The results of the survey are similar to the responses provided by small boat fishers from Guam and do not appreciably change the conclusions presented in Section 3.12 (Socioeconomic Resources) of the 2015 MITT Final EIS/OEIS.

Demographically, small boat fishers are more likely to identify as Chamorro relative to the general population. Approximately 70 percent of boat owners reported that they allowed others to use their boat, indicating that many boats are shared by multiple fishers. As with fishers in Guam, fish-aggregating devices were reported as important to small boat fishers. Over 70 percent reported using a fish aggregating device at least over 12 months. Similar to fishers in Guam, fishers in the CNMI reported consuming approximately 28 percent of their catch at home, giving away 38 percent of their catch, and selling approximately 29 percent. The remaining 5 percent of the catch was either released or exchanged for goods and services (Hospital & Beavers, 2014). However, less than half of fishers in the CNMI were able to sell all of the catch that they wanted to sell, indicating that the market is limited.

Hospital and Beavers (2014) concluded that the CNMI small boat fisheries are a complex mix of subsistence, cultural, recreational, and quasi-commercial fishing practices and validated the socioeconomic importance of fishing to the people of the CNMI.

Small boat fishers were also asked if military activities had affected their fishing trips in the previous 12 months. Approximately one-third of fishers reported trips had been affected by military exercises; however, the survey did not gather information on how trips were affected. While not explicitly clear, the results of the survey imply that waters around FDM were of particular interest to fishers and that activities at FDM were the primary source of impacts on fishing trips. Starmer (2005) noted that many target fish species have become less common in waters around Saipan and Tinian and are more abundant in waters surrounding FDM, which may be an incentive for fishers to attempt to fish near FDM rather than at other unrestricted locations.

Commercial fisheries landings in the CNMI for all species from the years 2005 through 2009 were presented in Section 3.12 (Socioeconomic Resources) of the 2015 MITT Final EIS/OEIS (see Table 3.12-2 in that document). Since the year 2010, total fisheries landings (in pounds of fish) fluctuated between a high of over 315,000 pounds in the year 2013 to 170,000 pounds in the year 2015 (Figure 3.12-2). The value of commercial landings followed a similar pattern, reaching a high of over $798,000 in the year 2014 but decreasing by nearly half in the year 2015. The price per pound also varied, ranging between $2.13 in the year 2010 and $2.69 in the year 2014. Even though the total landings decreased in the year 2015, the price per pound remained relatively high at $2.51 (Pacific Islands Fisheries Science Center, 2016a).

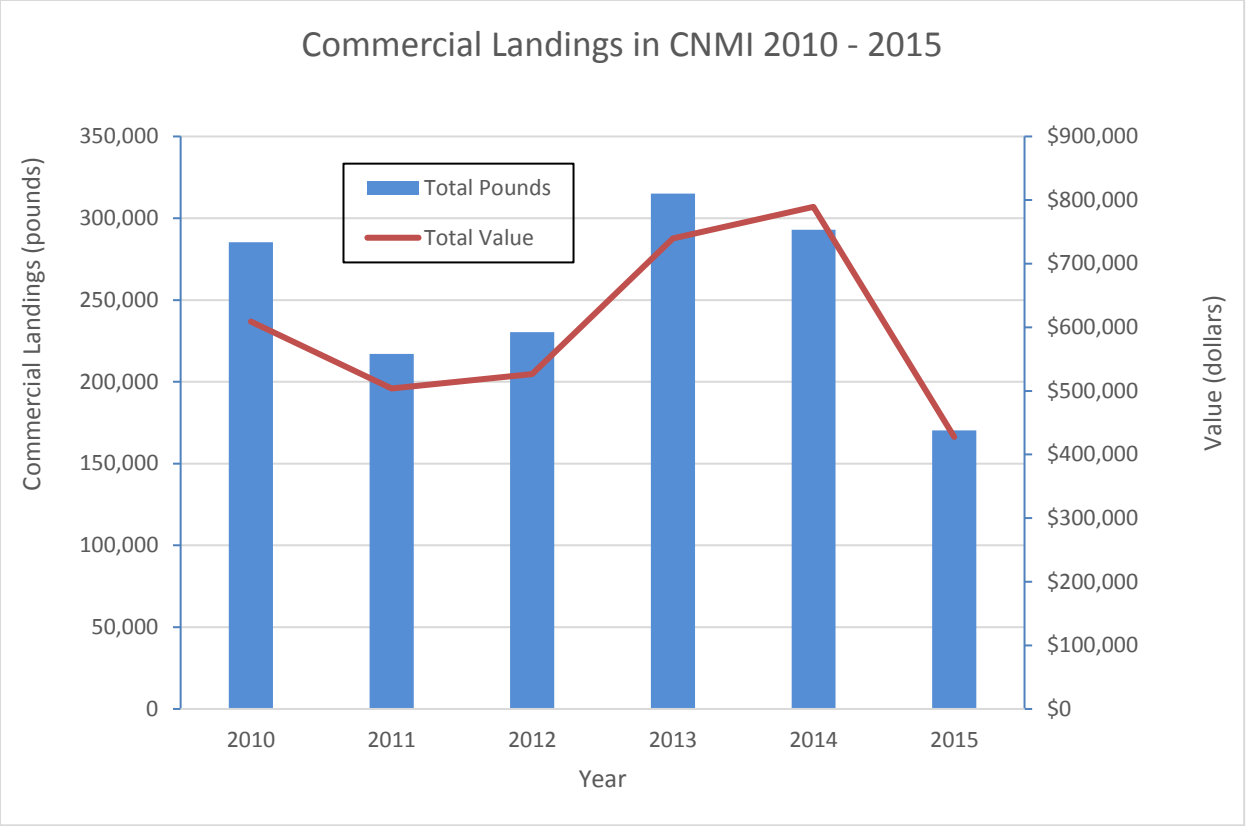

Figure 3.12-2: Commercial Fisheries Landings in the CNMI from the Years 2010 through 2015

While the trend in commercial fisheries landings from the years 2010 through 2015 is ambiguous, the historical trend of landings in the coral reef fishery, one of the three major fisheries in the CNMI and Guam and of particular importance to traditional fishers, clearly shows a decline (Cuetos-Bueno & Houk, 2014). Since the 1950s, the researchers estimate that commercial and non-commercial reef fishery landings have declined by 39–73 percent. In addition to greater fishing pressure from commercial, recreational, and traditional fishing practices, particularly near population centers, a decline in the health and extent of coral reefs in the region has contributed to decreased landings. See Section 3.8 (Marine Invertebrates) for more information on coral reefs in the Study Area.

The majority of training and testing activities occur offshore in deep waters and not in close proximity to coral reefs, which are located in relatively shallow, nearshore waters. Refer to Chapter 2 (Description of Proposed Action and Alternatives) and Appendix A (Training and Testing Activities Descriptions) for information on where the proposed training and testing activities typically occur. Refer to Section 3.8 (Marine Invertebrates) for information and the locations of coral reefs in the Study Area. Some activities, such as those occurring at FDM, have the potential to affect coral reefs and, by extension, the coral reef fishery. Surveys conducted by Smith and Marx (2016) indicate that the health, abundance, and biomass of reef fish populations in the vicinity of FDM are comparable or superior to populations at other locations in the CNMI, likely due to the de facto protection from fishing that results from restricting access to the area around FDM (Thompson et al., 2017). The authors conclude that training and testing activities are having little to no negative impact on the reef fish fishery. Having a de facto protected area around FDM may benefit the reef fish fishery in the CNMI, beyond the restricted area

around FDM; however, restricting access to nearshore areas (within 3 NM) around FDM where target species occur limits the ability for fishers to gain access to potentially productive fishing sites.

3.12.1.2.3 Transit Corridor

There are no data on commercial or recreational fishing within the transit corridor. Navy vessels using the corridor travel east from Guam directly into ocean waters far from shore. Due to the distance from land and a lack of known fishing areas within the corridor, it is assumed that there is limited to no commercial and recreational fishing activity within the transit corridor.

3.12.1.3 Tourism

Coastal tourism and associated recreational activities that tourists participate in can be defined as the full range of tourism, leisure, and recreationally oriented activities that take place in the coastal zone and offshore coastal waters. From an economic point of view, tourism drives infrastructure development (e.g., hotels, resorts, restaurants, vacation homes), businesses (e.g., retail shops, marinas, fishing tackle stores, dive shops), and services (e.g., guided tours, charter boat cruises, cultural exhibitions arranged for tourists) that create local jobs and tax revenue for the local government. In-water activities that attract tourists to Guam and the CNMI include swimming, snorkeling, scuba diving, wildlife watching (e.g., dolphin cruises), pleasure boating, sailing, and annual events such as the Rota Blue triathlon.

3.12.1.3.1 Guam

Tourism is Guam's largest industry; it generates $1.5 billion annually, makes up 60 percent of business revenue, and supports 33 percent of all employment on the island (Guam Visitors Bureau, 2014, 2017). In 2016, Guam welcomed over million 1.53 million visitors, which is the highest annual total for visitor arrivals on Guam in any calendar year (Guam Visitors Bureau, 2017). Visitors from Japan accounted for half, approximately 752,000 visitors; however, Japanese visitors made up 76 percent of the market in 2010 (Guam Visitors Bureau, 2014, 2017). The decline in the Japanese market share is not entirely due to a reduction in visitors from Japan. It is also attributed to Guam's efforts to broaden its tourism market to include visitors from other countries, particularly China, which has the fastest-growing visitor market in the world. China contributed just 0.7 percent of visitors to Guam in the year 2012, but 1.8 percent in the year 2016, and the Guam Visitor's Bureau projects that Chinese visitors will make up between 5.7 and 17.5 percent of tourists by the year 2020 (Guam Visitors Bureau, 2014, 2017). The other significant visitor markets in the year 2016 were Korea (34.8 percent), the United States (5.2 percent), and Taiwan (2.8 percent).

Approximately 23 percent of the value of Guam's GDP in the year 2016 was from spending by the federal government, including defense spending (Hovland et al., 2017a). Revenue from the government has provided Guam with an economic buffer against fluctuations in the tourism industry. Tourism in Guam has continued to increase both in the number of visitors and in its contribution to the economy since completion of the 2015 MITT Final EIS/OEIS. Even though trends in tourism are positive, the existing conditions and the results of the analysis of impacts on tourism presented in the 2015 MITT Final EIS/OEIS remain valid.

3.12.1.3.2 Commonwealth of the Northern Mariana Islands

Tourism is the largest industry in the CNMI and has driven a positive growth in GDP over the past five years (Hovland et al., 2017b; Marianas Visitors Authority, 2016). Visitors from Korea and China each made up 38 percent of the market in the year 2015, increasing their market share by 39 percent and

15 percent over FY 2014, respectively. The number of visitors from Japan, which has historically been the dominant market, made up just 18 percent of visitors in the year 2015, a 23 percent decrease over 2014. The decline is primarily attributed to a poor exchange rate for Japanese travelers and Japan's stagnant economy; however, it has also been a challenge to maintain regular direct flights from Japan to the CNMI (Marianas Visitors Authority, 2016). Visitors from Russia declined by 80 percent in the year 2015 due to the suspension of direct flights to the CNMI, economic sanctions instituted by the European Union and the United States, and a drop in global oil prices. In the year 2016, the total number of visitors from all countries combined increased by 10 percent over the year 2015 (Hovland et al., 2017b).

Approximately 2 percent of the value of the CNMI's GDP in the year 2016 was from spending by the federal government and 21 percent was from spending by the territorial government (Hovland et al., 2017b). Government spending buffers the CNMI economy against downturns in tourism; however, the CNMI does not receive the same proportion of federal funds as Guam, leaving the CNMI economy more susceptible to fluctuations in tourism. Even though trends in tourism are positive, the existing conditions, as presented in the 2015 MITT Final EIS/OEIS, and the results of the analysis of impacts on tourism remain valid.

3.12.1.3.3 Transit Corridor

It is assumed that there is no tourism activity within the transit corridor due to the distance from land and because the majority of tourism activities occur in nearshore waters.

3.12.1.4 Environmental Justice

The U.S. Environmental Protection Agency defines environmental justice as the "fair treatment" and "meaningful involvement" of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (U.S. Environmental Protection Agency, 2016). The phrase "fair treatment" means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. The phrase "meaningful involvement" means that

- people have an opportunity to participate in decisions about activities that may affect their environment or health,
- the public's contribution can influence the regulatory agency's decision,
- their concerns will be considered in the decision-making process, and
- the decision makers seek out and facilitate the involvement of those potentially affected" (Federal Aviation Administration, 2015).

Based on data from the 2010 U.S. Census, the population over the age of 16 in Guam was 113,067, which represents the working population (U.S. Census Bureau, 2018a). Of those people who are of working age, 61.4 percent were employed in the civilian workforce and 4.4 percent were in the armed forces. According to the census data, 2.3 percent of employed people in Guam also participated in a subsistence activity (e.g., fishing), and just 0.6 percent of people who were not in the labor force participated in a subsistence activity. Therefore, less than 3 percent of the working age population reported participating in a subsistence activity in the year 2010, which is likely to be fishing, but does not exclude other activities, such as growing crops. In the CNMI, 38,679 people are of employable age (at least 16 years old), and 64.2 percent are employed in the civilian workforce (U.S. Census Bureau, 2018b). According to the census data, 2.9 percent of employed people in the CNMI also participated in a

subsistence activity (e.g., fishing), and just 0.6 percent of people who were not in the labor force participated in a subsistence activity. Therefore, approximately 3 percent of the working age population in the CNMI reported participating in a subsistence activity in the year 2010.

Traditional fishing practices were identified by residents of Guam and the CNMI as having the potential to be impacted by the proposed training and testing activities occurring at sea and on FDM.

3.12.1.4.1 Traditional Fishing Practices

The U.S. Environmental Protection Agency considers subsistence fishers to be people who rely on non-commercial fish as a major source of protein (U.S. Environmental Protection Agency, 2002). Many communities worldwide meet this definition of subsistence fishing, including local communities on Guam and the CNMI. However, many of these communities engage in traditional fishing practices not just for subsistence or financial reasons but as part of their cultural heritage and social customs (U.S. Environmental Protection Agency, 2002). Native Alaskans regard traditional fishing practices as a way of life, not a marginal existence to overcome or to rise above.

> "It's something rich. It's spiritual. It's economic. It's social. It's getting together with your friends and your relatives going out there harvesting, and sharing with elders, sharing with widows, and that's a pride we get." (U.S. Environmental Protection Agency, 2002).

Although this definition is from a native Alaskan fisher, similar input was received from Asian and Pacific Islander groups, more closely linked to fishers from Guam and the CNMI. For example, ethnic Asian and Pacific Islanders residing in the United States, "consider seafood collection and consumption as healthy activities that reflect a homelike lifestyle."

Traditional fishers tend to consume non-commercial fish or shellfish at higher rates than other populations who fish, and for a greater percentage of the year, because of cultural customs or economic factors. In the United States, there are no particular criteria or thresholds (such as income level or frequency of fishing) that definitively describe traditional fishers. Allen (2013) reported on the complicated issue of defining traditional fishers in the western Pacific region, including Guam and the CNMI. Many fishers identifying as traditional or subsistence fishers also participate in recreational and commercial fishing. It is not always clear when fishers are engaging in subsistence fishing, fishing for cultural or social reasons, fishing for financial gain or leisure, or some combination, which can occur even on a single fishing trip. Nevertheless, the contribution of non-commercial traditional fishing to the GDP of U.S. Pacific island territories is likely underestimated in fisheries catch data by as much as five times (Cuetos-Bueno & Houk, 2014; Zeller et al., 2014).

The multifaceted nature of traditional fishing practices and their contribution to local communities remains difficult to quantify; however, it is clear that there is both a social and economic benefit to many in those communities even for those who rarely or never actually fish (e.g., someone who doesn't fish may receive fish at low or no cost). Allen (2013) offers a framework to better define traditional fishing practices that is aimed at disentangling traditional fishing from other types of fishing (e.g., recreational or commercial fishing). Discerning specific details on when and to what degree traditional fishing is occurring in the Study Area is beyond the scope of this analysis. However, it is clear that traditional fishing is more than an economic necessity; it is an important part of the cultural and social identity of indigenous peoples and Asian immigrant communities living in Guam and in the CNMI (U.S. Environmental Protection Agency, 2002).

Lower-income communities are more likely to engage in subsistence fishing and may be disproportionately affected by declines in a fishery (Allen & Bartram, 2008; Allen, 2013; Hospital & Beavers, 2014; Office of Environmental Health Hazard Assessment, 1997). An important part of the cultural heritage of local communities practicing traditional fishing is sharing the catch, which lower-income individuals and families in the community may depend on as a source of nutrition whether or not they fish. Most subsistence fishing is expected to occur within 3 NM from shore, because the smaller boats that are typically used by traditional fishers are not equipped for long trips offshore, and traditional fishing sites are generally associated with nearshore reefs.

3.12.1.4.1.1 Guam

The 2015 NMFS stock assessment report for the bottomfish fishery in Guam and the CNMI concluded that the fishery was not overfished through the year 2013, and modeled projections predicted that the fishery was very unlikely to become overfished by the year 2017 (Yau et al., 2016). However, coral reef fisheries, which support most traditional fishing in the Study Area, have declined over the past 30 years (Weijerman et al., 2016). From 1985 through 1990 the average annual catch was approximately 100 tons, but from the years 2007 through 2012 the average annual catch decreased to 37 tons. The total estimated fishing effort remained relatively stable over the time period (1985–2012), indicating that fishing for reef fishes as an activity, whether for recreation, subsistence, or commercial purposes, on Guam and the CNMI was not responsible for the decline in the catch. Weijerman et al. (2016) also noted that the decline was distributed over most gear types, indicating that a change associated with a particular gear type (e.g., a restriction on usage) was not disproportionately affecting the catch. Furthermore, historical data on the biomass of targeted fish species showed a general decrease in biomass from the years 1985 through 2012 (Weijerman et al., 2016). These results show that the decline in the reef fish fishery has been occurring for decades and is expected to continue.

If the availability of target species in the reef fish fishery continues to decline, the annual catch from traditional fishers will also decline. As noted above, quantifying the total catch from traditional fishing is a complex issue that makes measuring and predicting the impacts of a decline challenging. Even though the catch may continue to decline, traditional fishing practices may not be proportionately impacted, because the social and cultural aspects of the traditional fishing are not necessarily dependent on successfully catching and harvesting fish. As noted in the research by Weijerman et al. (2016), fishing effort (i.e., a measure of how much fishing occurred) remained relatively stable despite recent declines in the catch. While target fish species may be less available, which may have a greater impact on the success of traditional practices like subsistence fishing, overall traditional fishing practices on Guam have not changed appreciably since the 2015 MITT Final EIS/OEIS, and the analysis in the 2015 MITT Final EIS/OEIS remains valid. Refer to Section 3.12.2.3 (Subsistence Use) of the 2015 MITT Final EIS/OEIS for a discussion of subsistence fishing practices on Guam.

3.12.1.4.1.2 Commonwealth of the Northern Mariana Islands

As reported for Guam (see Section 3.12.1.4.1.1, Guam) NMFS stock assessment report predicted that the bottomfish fishery in the CNMI was highly unlikely to become overfished by the year 2017 (Yau et al., 2016). However, the catch from the non-commercial reef fish fishery in the CNMI, which supports most traditional fishing, has historically been underestimated yet has clearly been in decline since the late 1970s based on data from a new reporting system introduced at that time (Cuetos-Bueno & Houk, 2014). Since the 1950s, the catch, which was estimate to have been 450 tons per year, has declined by 39 to 73 percent depending on the scenario used to extrapolate the survey data. More recently the

catch is estimate to have declined from 250 tons per year in the year 2005 to 100 tons in the year 2012, a decrease of 60 percent (Cuetos-Bueno & Houk, 2014).

Similar to traditional fishing practices in Guam, if the availability of target species in the reef fish fishery in the CNMI continues to decline, the annual catch from traditional fishers is likely to decline. Traditional fishers that are more dependent on a successful catch (e.g., subsistence fishers) may be impacted to a greater degree than fishers who engage in traditional practices for social and cultural reasons. As noted in recent research by (Weijerman et al., 2016), fishing effort remained relatively stable despite declines in the catch. While target fish species may be less available, traditional fishing practices in the CNMI have not changed appreciably since the 2015 MITT Final EIS/OEIS, and the analysis in the 2015 MITT Final EIS/OEIS remains valid. Refer to Section 3.12.2.3 (Subsistence Use) of the 2015 MITT Final EIS/OEIS for a discussion of subsistence fishing practices in the CNMI.

3.12.1.4.1.3 Transit Corridor

There are no data on traditional fishing practices occurring in the transit corridor. Navy vessels using the corridor travel east from Guam directly into ocean waters far from shore. It is assumed that traditional fishing practices do not typically occur within the transit corridor, because the corridor is a transoceanic route and the majority of traditional fishing occurs in nearshore waters.

3.12.2 Environmental Consequences

The 2015 MITT Final EIS/OEIS analyzed training and testing activities currently occurring in the Study Area and considered all potential stressors related to socioeconomic resources. Stressors applicable to socioeconomic resources in the Study Area are the same stressors analyzed in the 2015 MITT Final EIS/OEIS:

- Accessibility (to the ocean and the airspace)
- Airborne acoustics (weapons firing, aircraft, and vessel noise)
- Physical disturbance and strike (aircraft, vessels and in-water devices, military expended materials)
- Secondary stressors (from availability of resources)

This section evaluates how and to what degree potential impacts on socioeconomic resources from stressors described in Section 3.0 (Introduction) may have changed since the analysis presented in the 2015 MITT Final EIS/OEIS was completed. Tables 2.5-1 and 2.5-2 in Chapter 2 (Description of Proposed Action and Alternatives) list the proposed training and testing activities and include the number of times each activity would be conducted annually and the locations within the Study Area where the activity would typically occur under each alternative. The tables also present the same information for activities described in the 2015 MITT Final EIS/OEIS so that the proposed levels of training and testing activities under this SEIS/OEIS can be easily compared. The analysis includes consideration of the mitigation that the Navy would implement to avoid or reduce potential impacts on seafloor resources, some of which are important socioeconomic resources.

3.12.2.1 Accessibility (to the Ocean and Airspace)

3.12.2.1.1 Impacts from Limits on Accessibility Under Alternative 1

In some cases, under Alternative 1, the number of proposed training and testing events would change as compared to the number of events proposed in the 2015 MITT Final EIS/OEIS (see Tables 2.5-1 and 2.5-2 in this SEIS/OEIS for changes in the number of annual events for specific activities). Training and testing

activities that would increase under Alternative 1 would potentially increase limits on accessibility to areas of the Study Area that are used by both the military and the public. However, decreases in the number of training and testing events occurring in areas of co-use would potentially decrease the number of times access to those areas is restricted. Only some training and testing activities that either increased or decreased have the potential to impact accessibility and require further analysis to supplement the analysis in the 2015 MITT Final EIS/OEIS.

The activities that changed (i.e., increased or decreased) are identified (highlighted) in Tables 2.5-1 and 2.5-2 and in Appendix F (Training and Testing Activities Matrices) in this SEIS/OEIS. The two tables and Appendix F were used together to identify which of the activities that either increased or decreased have the potential to impact accessibility in the Study Area. For example, five Gunnery Exercise (GUNEX) (Surface-to-Air–Large Caliber) activities per year were proposed in the 2015 MITT Final EIS/OEIS, and six are proposed under Alternative 1 in this SEIS/OEIS (Table 2.5-1). Referring to Table F-1 (Stressors by Training Activity) in Appendix F, the activity GUNEX (Surface-to-Air) is identified with a check mark as having the potential to limit accessibility (listed as a socioeconomic stressor) by the public to areas in the Study Area.

As shown in Appendix F (Training and Testing Activities Matrices), the majority of the proposed training and testing activities introduce stressors on accessibility, which supports using the number of annual events proposed under each alternative as a metric to compare impacts. Generally, activities involving the use of aircraft, vessels, or in-water devices may temporarily limit accessibility to areas of the Study Area. Table 3.0-11 in Section 3.0 (Introduction) shows that the number of annual events using aircraft would decrease by about 10 percent under Alternative 1; however, Table 3.0-12 and Table 3.0-13 show that the number of annual events using vessels and in-water devices would increase by about 15 and 4 percent, respectively, under Alternative 1 compared to totals in the 2015 MITT Final EIS/OEIS.

After reviewing the changes in the numbers and types of proposed training and testing activities with the potential to limit accessibility, the Navy determined that potential impacts on accessibility would not be substantially different from the 2015 MITT Final EIS/OEIS. Therefore, the analysis, supplemented below, from the 2015 MITT Final EIS/OEIS remains valid.

Training and testing activities have the potential to temporarily limit access to areas of the ocean, which has the potential to impact commercial transportation and shipping, commercial recreation and fishing, traditional fishing practices, and tourism in the Study Area. The military requests that the U.S. Coast Guard issue NOTMARs to warn the public of upcoming training and testing activities requiring the exclusive use of sea space and to ensure the safety of the public and military personnel. Data on the number of NOTMARs issued from the years 2013 through 2017 for FDM and W-517 were added to the previous three years of data presented in the 2015 MITT Final EIS/OEIS (Figure 3.12-3). The data show that the number of NOTMARs issued for FDM peaked at 56 in the year 2017, and for W-517 the peak was in the year 2016 at 50 NOTMARs. The average number of NOTMARs issued annually over the eight years was 41 for FDM and 35 for W-517.

No NOTMARs were issued in 2016 for the recently established warning areas W-11, W-12, and W-13. In the year 2017, two NOTMARs were issued for W-12 affecting a total of five days.

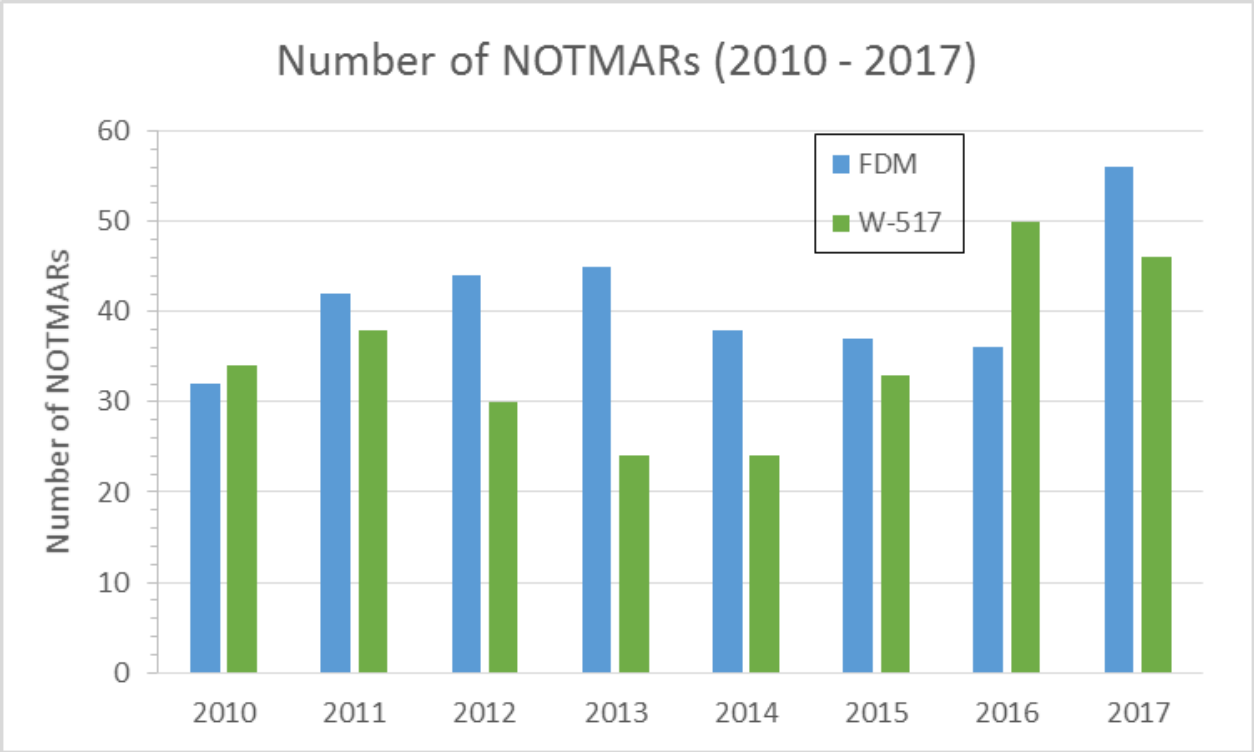

Figure 3.12-3: Number of NOTMARs Issued for FDM and W-517 from the Years 2010 through 2017

The number of days affected by activities occurring at FDM and W-517 has varied over the eight-year period from the years 2010 through 2017 (Figure 3.12-4). The data indicate a slightly increasing trend in affected days and potential impacts on accessibility; however, the peak totals are not substantially different from the previous eight years, and the trend appears to be cyclical (increases followed by decreases). Access to waters around FDM between 3 and 12 NM was restricted for an average of 160 days per year (peak of 201 in the year 2012), and access to waters under W-517 was restricted for an average of 91 days per year (peak of 136 in the year 2016). Access to waters within 3 NM of FDM is restricted at all times to ensure public safety during military activities using explosive munitions (33 CFR 334, Danger Zone and Restricted Area Regulations). If a restriction or closure is issued for any part of a particular day, then the day was considered to be affected by that closure. When a NOTMAR is issued, it specifies the time of day and the length of time that a particular area is restricted or closed to the public, which can range from a few hours to the entire day.

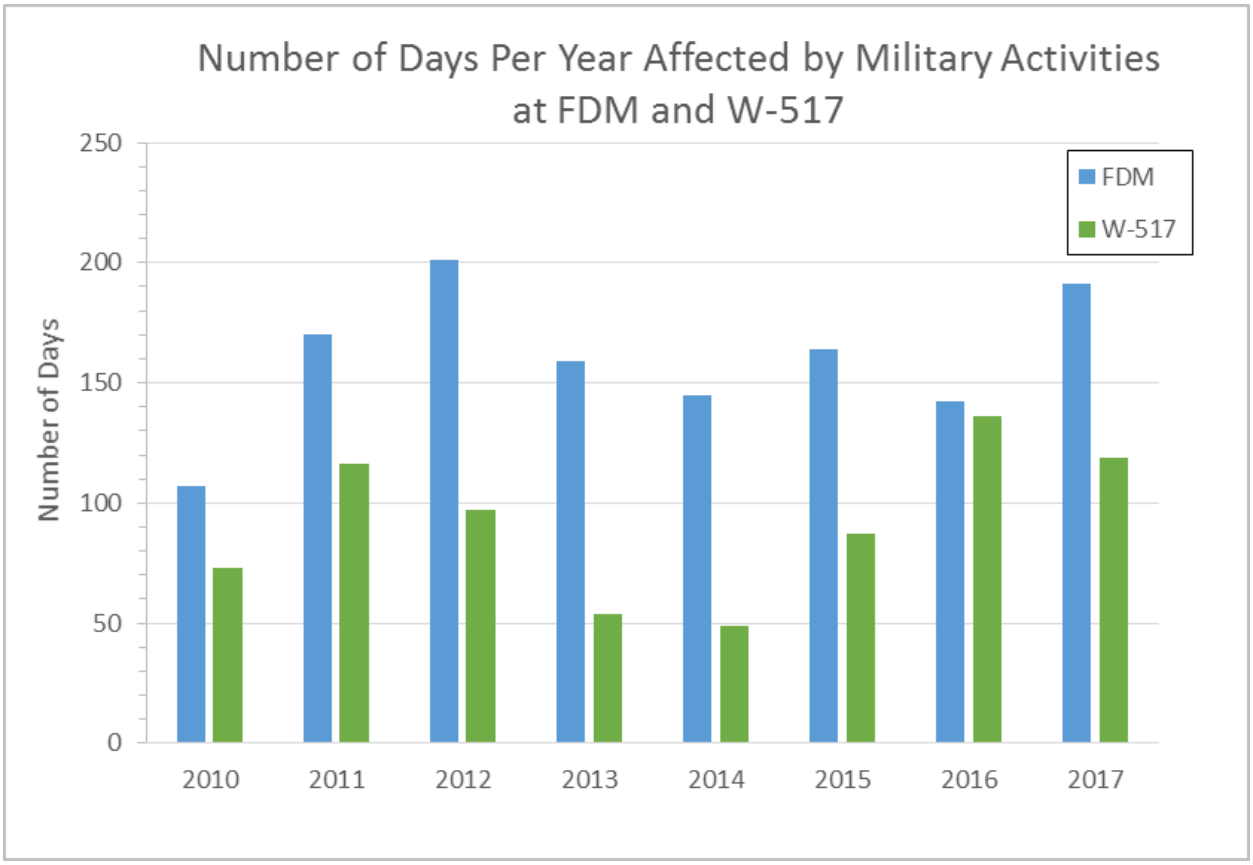

Figure 3.12-4: Number of Days per Year Affected by Military Activities at FDM and W-517

New information on commercial fisheries and tourism was added to Section 3.12.1.2 (Commercial and Recreational Fishing) and Section 3.12.1.3 (Tourism), respectively. While accessibility to popular fishing sites is a factor potentially affecting fishing and tourism, the data and supporting information for both industries indicate that other economic factors are driving current trends and forecasts in both industries (Cuetos-Bueno & Houk, 2014; Weijerman et al., 2016).

The military also requests that the FAA issue NOTAMs to warn the public of upcoming military activities requiring the exclusive use of airspace. Military operating areas and SUA are identified on nautical and aeronautical charts to inform surface vessels and aircraft that military activities occur in the area. When necessary, airspace used by the military is restricted for short periods of time (typically on the order of hours) to cover the timeframes of training and testing activities. The Navy posts NOTAMs when restrictions are in place prior to initiating a training or testing activity, and the military follows standard operating procedures to visually scan an area to ensure that non-participants (i.e., civilian vessels and aircraft) are not present. If non-participants are present, the military delays, moves, or cancels its activity. Public accessibility is no longer restricted once the activity concludes. Refer to Section 2.3.3 (Standard Operating Procedures) of this SEIS/OEIS for additional information on standard operating procedures.

No commercial or recreational activities occur or are permitted on or near FDM, and aircraft and marine vessels are restricted from entering within 3 NM of FDM. Even when live-fire or other potentially hazardous activities are not occurring at FDM, the threat of unexploded ordnance is always present. As with other activities, the Navy posts NOTMARs and NOTAMS at least 72 hours in advance of potentially

hazardous training and testing activities at FDM. NOTMARs and NOTAMs may extend restrictions out to 12 NM as needed for certain training and testing activities to ensure the safety and protection of the public and the military. Detailed information on accessibility to areas in the Study is presented in Section 3.12.3.1 (Accessibility [to the Ocean and Airspace]) in the 2015 MITT Final EIS/OEIS.

In addition to issuing NOTMARs and NOTAMs to announce scheduled training and testing events, upcoming events are communicated to stakeholders (e.g., Guam and CNMI local mayors, Guam legislators, resources agencies, and fishers) via e-mail distribution developed by Joint Region Marianas (JRM) with stakeholder input. Notices are also sent to the National Oceanic and Atmospheric Administration, local cable channels, and emergency management offices.

Other communication outlets available to the public include the JRM Public Affairs Office, which posts press releases on the JRM website and on the JRM Facebook page (https://www.facebook.com/jrmguam/) (Figure 3.12-5). Interested members of the public can also follow the JRM on Twitter. Posts to the JRM Facebook page activate a Twitter post. Naval Base Guam Public Affairs posts press releases on the Naval Base Guam Facebook page (https://www.facebook.com/USNavalBaseGuam/), and Naval Facilities Engineering Command, Marianas Public Affairs posts press releases on their Facebook page (https://www.facebook.com/navfacmarianas/).

As new communication tools become available, the military will consider their usefulness in communicating important information to the public about training and testing activities. The military will continue to engage the public on issues associated with accessibility to the ocean and airspace within the Study Area.

New information relevant to accessibility impacts has become available since publication of the 2015 MITT Final EIS/OEIS (Figure 3.12-3 and Figure 3.12-4) (Cuetos-Bueno & Houk, 2014; Weijerman et al., 2016). However, this information confirms that there has been no appreciable change to the existing environmental conditions as presented in the 2015 MITT Final EIS/OEIS, and the results of the analysis of impacts on accessibility to the ocean and airspace remain valid.

Upon completion of training and testing activities, restrictions are lifted and commercial and recreational fishers (and other non-military vessels) would be able to return to fish and transit through the area. To help manage competing demands and maintain public access in the Study Area, the military conducts its offshore operations in a manner that reduces restrictions to commercial fisherman. Military ships, fishers, and recreational users operate within the area together, and keep a safe distance between each other. Military participants would relocate as necessary to avoid conflicts with non-participants. The 3 NM area surrounding FDM is the only area designated as a surface danger zone that is permanently inaccessible to the public. The permanent designation is to ensure public safety.

The 2015 MITT EIS/OEIS notes that some training and testing activities may impact commercial and recreational fishing when areas of co-use are made temporarily, or in the case of waters surrounding FDM, permanently inaccessible to ensure the safety of the public. The number of NOTMARs issued from the years 2010 through 2017 restricting access to waters around FDM peaked in the year 2016 and the number of days affected by activities at FDM was the highest since the year 2012 (Figure 3.12-3, Figure 3.12-4). For W-517, both the number of NOTMARs and the number of days affected peaked in the year 2016. Considering that temporary restrictions on accessing areas of co-use would be infrequent and short-term, and other fishing sites in the Study Area would be available to the public, significant impacts on commercial and recreational fishing are not anticipated.

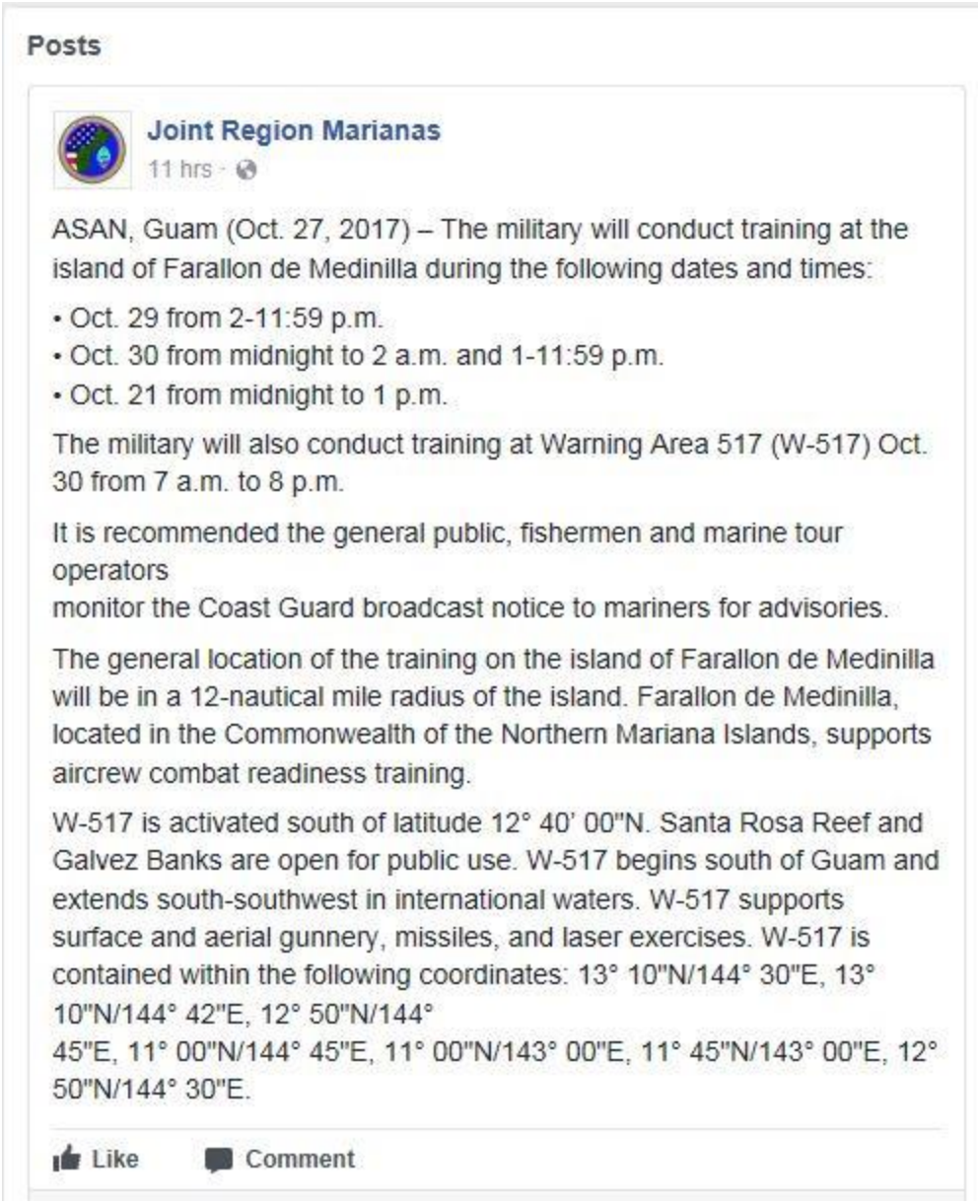

Figure 3.12-5: Joint Region Marianas Facebook Post Announcing Military Training Activities at FDM and W-517

Traditional fishers in Guam and the CNMI would also be impacted by temporary restrictions limiting access to certain areas where traditional fishing practices take place. As described in Section 3.12.1.4.1 (Traditional Fishing Practices), many fishers identifying as traditional fishers also participate in recreational and commercial fishing, and it is not clear when fishers are engaging in traditional fishing, which has communal and cultural significance, and when they are fishing for financial gain or leisure or some combination of one or more of these motivations, which can occur even on a single fishing trip (Allen, 2013). These data suggest that traditional fishing likely occurs in the same locations as commercial and recreational fishing, and that traditional fishers would not be disproportionately impacted by temporary limits on access to fishing sites. Other fishing sites in the Study Area would be

available to traditional fishers, and significant impacts on traditional fishing in the Study Area are not anticipated.

The military will continue to collaborate with local communities to enhance existing means of communications with the aim of reducing the potential effects of limiting access to areas designated for use by the military.

3.12.2.1.2 Impacts from Limits on Accessibility Under Alternative 2

In some cases, under Alternative 2, the number of proposed training and testing events would change as compared to the number of events proposed in the 2015 MITT Final EIS/OEIS (see Tables 2.5-1 and 2.5-2 in this SEIS/OEIS for changes in the number of annual events for specific activities). Only some activities that increased under Alternative 2 have the potential to impact accessibility to areas in the Study Area used by both the military and the public. The activities that increased are identified (highlighted) in Tables 2.5-1 and 2.5-2 and in Appendix F (Training and Testing Activities Matrices) in this SEIS/OEIS. For example, six Gunnery Exercise (Surface-to Air–Large Caliber) activities per year are proposed under Alternative 1, nine are proposed under Alternative 2, and this activity has the potential to limit accessibility.

Under Alternative 2, similar to Alternative 1, activities involving the use of aircraft, vessels, or in-water devices may temporarily limit accessibility to areas of the Study Area. Table 3.0-11 in Section 3.0 (Introduction) shows that the number of annual events using aircraft is approximately the same under Alternative 2 as under Alternative 1, while Table 3.0-12 and Table 3.0-13 show that the number of annual events using vessels and in-water devices is only marginally higher under Alternative 2 compared with Alternative 1.

After reviewing the changes in the numbers and types of training and testing activities with the potential to limit accessibility, the Navy determined that potential impacts on accessibility under Alternative 2 would be the same or similar to impacts identified under Alternative 1. Therefore, increases in the number of events shown in Tables 2.5-1 and 2.5-2 under Alternative 2 would have no appreciable change on the conclusions presented under Alternative 1 and in the 2015 MITT Final EIS/OEIS.

3.12.2.1.3 Impacts from Limits on Accessibility Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Other military activities not associated with this Proposed Action would continue to occur. Limits on accessibility to the ocean and airspace as listed above would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing training and testing activities would result in fewer limits on accessibility within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential for limiting accessibility by the public, but would not measurably improve accessibility to the ocean and airspace in the Study Area.

Certain limitations on accessing danger zones, restricted areas, and warning areas as described in the 2015 MITT Final EIS/OEIS and in the CFR would still apply. Refer to CFR, Title 33 (Navigation and Navigable Waters), Part 334 (Danger Zone and Restricted Area Regulations), 33 CFR 165.1401 (Safety Zones), 14 CFR Part 73.1 (Special Use Airspace) for specific regulations regarding these ocean areas and airspace. A more detailed description of danger zones, restricted areas, and special use airspace in the

Study Area is provided in Section 3.12.3.1 (Accessibility [to the Ocean and Airspace]) in the 2015 MITT Final EIS/OEIS.

Not conducting the proposed at-sea training and testing activities may have negative impacts on the socioeconomic resources of Guam and the CNMI. The number of jobs and types of jobs available on Guam, and to a lesser extent on the CNMI, may decline. The Navy and Navy personnel are an important and often stabilizing contributor to the local and regional economies. For example, vessels and associated equipment used specifically for training and testing activities would no longer be needed if all training and testing activities ceased. Consequently, the civilian and Navy personnel supporting those activities may be relocated, reassigned, or have to find other employment. The secondary effects from reducing the number of personnel who support at-sea training and testing activities could include a decline in revenue for local businesses frequented by Navy personnel and their families, such as businesses in the food services, retail, and housing sectors.

As described in Section 3.12.1 (Affected Environment), the Navy contributes to the economies of Guam and the CNMI, which includes expenditures associated with at-sea training and testing activities. If a substantial number of Navy personnel are relocated due to the elimination of training and testing activities, a portion of the 12,800 Navy personnel and their dependents (approximately 8 percent of the population) residing on Guam would potentially be relocated off the island. A reduction in the population and Navy funding for training and testing activities may lessen the ability of military funding to stabilize the economy against fluctuations in the tourism sector. Training activities that use any of the seven vessels assigned to Saipan would no longer be conducted. This may reduce the need for or usage of one or more of the vessels, leading to a reduction in the funding expended to maintain the vessels at Saipan. Based on these two examples, the economies and social communities on Guam and the CNMI would be impacted to some degree if the proposed at-sea training and testing activities were not conducted.

3.12.2.2 Airborne Acoustics

3.12.2.2.1 Impacts from Airborne Acoustic Stressors Under Alternative 1

Training and testing activities that would increase under Alternative 1 and that use vessels, aircraft, or weapons firing would potentially increase airborne acoustics in certain areas of the Study Area that are used by the military (Tables 2.5-1 and 2.5-2). However, decreases in the number of training and testing events occurring in areas of co-use would potentially decrease airborne acoustics in those areas. Only some training and testing activities that either increased or decreased have the potential to generate airborne acoustics and require further analysis to supplement the analysis in the 2015 MITT Final EIS/OEIS.

The activities that changed (i.e., increased or decreased) are identified (highlighted) in Tables 2.5-1 and 2.5-2 and in Appendix F (Training and Testing Activities Matrices) in this SEIS/OEIS. The two tables and Appendix F were used together to identify which of the activities that either increased or decreased have the potential to generate airborne acoustics in the Study Area. For example, five GUNEX (Surface-to-Air–Large Caliber) activities per year were proposed in the 2015 MITT Final EIS/OEIS, and six were proposed under Alternative 1 in this SEIS/OEIS (Table 2.5-1 in Chapter 2, Description of Proposed Action and Alternatives). Referring to Table F-1 (Stressors by Training Activity) in Appendix F (Training and Testing Activities Matrices), the activity GUNEX (Surface-to-Air) is identified with a check mark as having the potential to generate airborne acoustics (listed as a socioeconomic stressor) in the Study Area.

As shown in Appendix F (Training and Testing Activities Matrices), the majority of the proposed training and testing activities generate airborne acoustics, which supports using the number of annual events proposed under each alternative as a metric to compare impacts. Generally, activities involving the use of aircraft, vessels, or explosive munitions may generate airborne acoustics detectable by the public in areas of the Study Area where military and civilian activities occur in close proximity. Table 3.0-11 shows that the number of annual events using aircraft would decrease under Alternative 1 compared to totals in the 2015 MITT Final EIS/OEIS, and Table 3.0-16 shows that the use of nearly all types of explosive munitions would also decrease under Alternative 1.

After reviewing the changes in the numbers and types of proposed training and testing activities with the potential to generate airborne acoustics, the Navy determined that potential impacts from airborne acoustics on socioeconomic resources would not be substantially different from the 2015 MITT Final EIS/OEIS. Therefore, the analysis, supplemented below, from the 2015 MITT Final EIS/OEIS remains valid.

Loud noises generated from training and testing activities such as weapons firing, in-air explosions, and aircraft transiting have the potential to disrupt recreational activities such as wildlife viewing, boating, fishing, and scuba diving. In addition to local residents, tourists participate in these activities in the Study Area. Encountering loud noises, particularly those that occur suddenly and nearby, could interfere with the enjoyment of several types of recreational activities. Disturbance from continuous albeit less intense noises could also affect the enjoyment of an activity. Airborne noises from military activities would occur on a temporary basis and only when weapons firing and in-air explosions occur and as aircraft transit through an area. Training and testing activities involving weapons firing and in-air explosions would only occur when the military can confirm the area is clear of non-participants (e.g., the public). This would reduce the likelihood that noise from these activities, which are taking place far from non-participants, would disturb residents or tourists engaged in recreational activities on the water. Furthermore, most training and testing activities involving aircraft occur more the 12 NM from shore and those that occur closer to shore are typically at least 3 NM offshore (with the exception of activities at FDM). Noises generated from training and testing activities would occur far offshore and at a great distance from the recreational activities that typically occur closer to shore, reducing the disturbing effect of any perceived noise.

Noise from aircraft overflights would occur most frequently around Guam, the busiest airport in the Study Area, during takeoff and landing. Air Traffic Control Assigned Airspace is used for training and testing activities in the Study Area. The airspace referred to as Air Traffic Control Assigned Airspace-6 overlays Guam, Saipan, Tinian, and Rota and has a lower altitude limit of 39,000 ft. Aircraft at that altitude (or higher) are not likely to generate noise at sea level that would disrupt recreational activities. Revenue from tourism and recreational activities is not expected to be impacted by airborne noise. Refer to Section 3.12.2.1.2 (Air Traffic) of the 2015 MITT Final EIS/OEIS for more information on the different types of special use airspace in the Study Area and potential socioeconomic impacts from airborne noise.

There has been no appreciable change to the existing environmental conditions as presented in the 2015 MITT Final EIS/OEIS, and the results of the analysis of impacts from airborne noise on recreational activities and tourism remain the same. Therefore, no impacts on tourism would be anticipated because (1) most military training occurs well out to sea, while most tourism and recreational activities occur nearshore; (2) military aircraft generally depart from Andersen Air Force Base and travel north well away

from tourist and residential areas; and (3) training and testing activities producing airborne noise are normally short term and temporary. Therefore, airborne noise impacts on tourism would be negligible.

Traditional fishers in Guam and the CNMI would not be disproportionately impacted by airborne acoustics, because traditional fishing practices likely occurs in the same general areas as recreational fishing (Allen, 2013), which is close to shore and far from the majority of training and testing activities that generate higher levels of airborne acoustics.

3.12.2.2.2 Impacts from Airborne Acoustic Stressors Under Alternative 2

In some cases, under Alternative 2, the number of proposed training and testing events would change as compared to the number of events proposed in the 2015 MITT Final EIS/OEIS (see Tables 2.5-1 and 2.5-2 in this SEIS/OEIS for changes in the number of annual events for specific activities).Only some activities that increased under Alternative 2 have the potential to generate airborne acoustics that would be detectable by the public. The activities that increased are identified (highlighted) in Tables 2.5-1 and 2.5-2 and in Appendix F (Training and Testing Activities Matrices) in this SEIS/OEIS. For example, six GUNEX (Surface-to Air – Large Caliber) activities per year are proposed under Alternative 1, and nine are proposed under Alternative 2, and this activity would generate airborne acoustics that may be detectable by the public.

Under Alternative 2, activities involving the use of aircraft, vessels, or explosive munitions may generate airborne acoustics detectable by the public in areas of the Study Area where military and civilian activities occur in close proximity. Table 3.0-11 shows that the number of annual events using aircraft slightly increases under Alternative 2 compared to Alternative 1, and Table 3.0-12 shows that activities using vessels would increase marginally (<10 percent) under Alternative 2. The numbers of the different types of explosive munitions used under Alternative 2 are either the same or similar to totals under Alternative 1 (Table 3.0-16).

After reviewing the changes in the numbers and types of training and testing activities with the potential to increase airborne acoustics, the Navy determined that potential impacts from airborne acoustics under Alternative 2 would be the same or similar to impacts identified under Alternative 1. Therefore, increases under Alternative 2 would have no appreciable change on the conclusions presented under Alternative 1 and in the 2015 MITT Final EIS/OEIS.

3.12.2.2.3 Impacts from Airborne Acoustic Stressors Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Other military activities not associated with this Proposed Action would continue to occur. Disturbances from airborne acoustic stressors as listed above would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing training and testing activities would result in fewer disturbances from airborne acoustics within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential for disturbances from airborne acoustics, but would not measurably change the frequency or severity of disturbances from airborne acoustics experienced by the public in the Study Area.

Not conducting the proposed at-sea training and testing activities may have negative impacts on the socioeconomic resources of Guam and the CNMI. The number of jobs and types of jobs available on Guam and to a lesser extent on the CNMI may decline. The Navy and Navy personnel are an important

and often stabilizing contributor to the local and regional economies. For example, vessels and associated equipment used specifically for training and testing activities would no longer be needed if all at-sea training and testing activities ceased. Consequently, the civilian and Navy personnel supporting those activities may be relocated, reassigned, or have to find other employment. The secondary effects from reducing the number of personnel who support at-sea training and testing activities could include a decline in revenue for local businesses frequented by Navy personnel and their families, such as businesses in the food services, retail, and housing sectors.

As described in Section 3.12.1 (Affected Environment), the Navy contributes to the economies of Guam and the CNMI, which includes expenditures associated with at-sea training and testing activities. If a substantial number of Navy personnel are relocated due to the elimination of training and testing activities, a portion of the 12,800 Navy personnel and their dependents (approximately 8 percent of the population) residing on Guam would potentially be relocated off the island. A reduction in the population and Navy funding for training and testing activities may lessen the ability of military funding to stabilize the economy against fluctuations in the tourism sector. Training activities that use any of the seven vessels assigned to Saipan would no longer be conducted. This may reduce the need for or usage of one or more of the vessels, leading to a reduction in the funding expended to maintain the vessels at Saipan. Based on these two examples, the economies and social communities on Guam and the CNMI would be impacted to some degree if the proposed at-sea training and testing activities were not conducted.

3.12.2.3 Physical Disturbance and Strike Stressors

3.12.2.3.1 Impacts from Physical Disturbance and Strike Stressors Under Alternative 1

Training and testing activities that would increase under Alternative 1 and that use vessels, aircraft, munitions, and military expended materials would potentially increase the risk of physical disturbance and strike in certain areas of the Study Area that are used by both the military and the public (Tables 2.5-1 and 2.5-2). However, decreases in the number of training and testing events occurring in areas of co-use would potentially decrease the potential for physical disturbance and strike in those areas. Only some training and testing activities that either increased or decreased have the potential for physical disturbance and strike and require further analysis to supplement the analysis in the 2015 MITT Final EIS/OEIS.

The activities that changed (i.e., increased or decreased) are identified (highlighted) in Tables 2.5-1 and 2.5-2 and in Appendix F (Training and Testing Activities Matrices) in this SEIS/OEIS. The two tables and Appendix F were used together to identify which of the activities that either increased or decreased have the potential to result in a physical disturbance or strike in the Study Area. For example, five GUNEX (Surface-to-Air – Large Caliber) activities per year were proposed in the 2015 MITT Final EIS/OEIS, and six were proposed under Alternative 1 in this SEIS/OEIS (Table 2.5-1 in Chapter 2, Description of Proposed Action and Alternatives). Referring to Table F-1 (Stressors by Training Activity) in Appendix F (Training and Testing Activities Matrices), the activity GUNEX (Surface-to-Air) is identified with a check mark as having the potential for physical disturbance and strike (listed as a socioeconomic stressor) in the Study Area.

As shown in Appendix F (Training and Testing Activities Matrices), the majority of the proposed training and testing activities use vessels, in-water devices, aircraft, munitions, or military expended materials and could result in a physical disturbance or strike, which supports using the number of annual events proposed under each alternative as a metric to compare impacts. Table 3.0-11 shows that the number

of events using aircraft would decrease by about 10 percent under Alternative 1 compared to totals in the 2015 MITT Final EIS/OEIS; however, Table 3.0-12 and Table 3.0-13 show that the number of annual events using vessels and in-water devices would increase by about 15 and 4 percent, respectively, under Alternative 1 compared to totals in the 2015 MITT Final EIS/OEIS. Table 3.0-15 shows that the use of some non-explosive practice munitions would increase over the totals in the 2015 MITT Final EIS/OEIS, while other non-explosive practice munitions would decrease; Table 3.0-16 shows that the use of nearly all types of explosive munitions would also decrease under Alternative 1. Most types of other military expended materials would decrease under Alternative 1 (Table 3.0-15).

After reviewing the changes in the numbers and types of proposed training and testing activities with the potential for physical disturbance and strike and the numbers of munitions and other military expended materials that would be used, the Navy determined that potential impacts from physical disturbance and strike on socioeconomic resources would not be substantially different from the 2015 MITT Final EIS/OEIS. Therefore, the analysis, supplemented below, from the 2015 MITT Final EIS/OEIS remains valid.

The evaluation of impacts on socioeconomic resources from physical disturbance and strike stressors focuses on direct physical encounters or collisions with objects moving through the water or air (e.g., vessels, aircraft, unmanned devices, and towed devices), dropped or fired into the water (non-explosive practice munitions, other military expended materials, and ocean bottom deployed devices), or resting on the ocean floor (anchors, mines, targets) that may damage or encounter civilian equipment. Physical encounters that damage equipment and infrastructure could disrupt the collection (e.g., of fisheries resources) and transport of products, which could impact industry revenue or operating costs. Socioeconomic resources potentially impacted by encounters with military vessels, devices, and objects include commercial transportation and shipping, commercial and recreational fishing, traditional fishing practices, and tourism.

The majority of commercial and recreational fishing, traditional fishing practices, and tourism in the Study Area takes place in nearshore waters (less than 3 NM from shore), where the military conducts limited training and testing activities involving munitions or other expended materials. Therefore, most recreational fishing, traditional fishing practices, and tourism activities would occur far away from physical disturbance and strike stressors.

Larger commercial fishing vessels are more likely to go beyond 3 NM and approach areas where the military trains and tests and could be affected by physical disturbances or strikes. The military's standard operating procedures, which are discussed in Section 2.3.3 (Standard Operating Procedures) of this SEIS/OEIS, includes ensuring that an area is clear of all non-participating vessels before training and testing activities take place, which includes commercial fishing vessels (refer to Section 3.12.3.3, Physical Disturbance and Strike, of the 2015 MITT Final EIS/OEIS for detailed analysis).

Commercial shipping vessels transport goods internationally and would be expected to transit through offshore waters en route to domestic and foreign ports. Shipping vessels follow established routes which are avoided by the military during training and testing activities, and both military and civilian vessels in proximity to each other are expected to communicate their positions. In addition, the military provides advance notification of training and testing activities to the public through NOTMARs and other means of communication as described in Section 3.12.2.1 (Accessibility [to the Ocean and Airspace]). For these reasons, a direct strike or collision with a shipping vessel is unlikely.

Additional information and analysis of physical disturbance and strike stressors and the potential for interactions with commercial fishing vessels and gear is described in Section 3.12.3.3 (Physical Disturbance and Strike) of the 2015 MITT Final EIS/OEIS.

New information relevant to physical disturbance and strike impacts has become available since publication of the 2015 MITT Final EIS/OEIS. There has been no appreciable change to the existing environmental conditions as presented in the 2015 MITT Final EIS/OEIS, and the results of the analysis of impacts from physical disturbance and strike on commercial transportation and shipping, commercial and recreational fishing, traditional fishing practices, and tourism remain the same. The advanced public release of NOTMARs and other public notices would inform the public of upcoming activities, and enable them to plan to avoid the area.

The Navy would implement mitigation to avoid or reduce impacts from physical disturbance and strike stressors on seafloor resources in mitigation areas throughout the Study Area (see Section 5.4.1, Mitigation Areas for Seafloor Resources). The mitigation areas will help avoid or reduce potential impacts on shallow-water coral reefs, live hard bottom, artificial reefs, and shipwrecks, which are valuable assets for the snorkeling, diving, and fishing industries. Considering the size of the Navy's Study Area, the wide distribution of military expended materials over this large area, and implementation of standard operating procedures and mitigation, impacts from physical disturbances and strikes on commercial and recreational fishing, traditional fishing practices, and tourism would be negligible under Alternative 1. Refer to Section 2.3.3 (Standard Operating Procedures) of this SEIS/OEIS for additional information on the Navy's standard operating procedures and Chapter 5 (Mitigation) for information on proposed mitigation measures.

Traditional fishers in Guam and the CNMI would not be disproportionately impacted by a potential physical disturbance and strike, because traditional fishing practices likely occurs in the same general areas as recreational fishing (Allen, 2013), which is close to shore and far from the majority of training and testing activities that have the potential to result in a physical disturbance and strike.

3.12.2.3.2 Impacts from Physical Disturbance and Strike Stressors Under Alternative 2

In some cases, under Alternative 1, the number of proposed training and testing events would change as compared to the number of events proposed in the 2015 MITT Final EIS/OEIS (see Tables 2.5-1 and 2.5-2 in this SEIS/OEIS for changes in the number of annual events for specific activities).Only some activities that increased under Alternative 2 have the potential to increase the risk of physical disturbance and strike in certain areas of the Study Area that are used by both the military and the public. The activities that increased are identified (highlighted) in Tables 2.5-1 and 2.5-2 and in Appendix F (Training and Testing Activities Matrices). For example, six GUNEX (Surface-to Air–Large Caliber) activities per year are proposed under Alternative 1, nine are proposed under Alternative 2, and this activity has the potential to result in a physical disturbance or strike.

As shown in Appendix F (Training and Testing Activities Matrices), the majority of the proposed training and testing activities use vessels, in-water devices, aircraft, munitions, or military expended materials and could result in a physical disturbance or strike, which supports using the number of annual events proposed under each alternative as a metric to compare impacts. Table 3.0-11 shows that the number of annual events using aircraft is approximately the same under Alternative 2 as under Alternative 1, while Table 3.0-12 and Table 3.0-13 show that the number of events using vessels and in-water devices is only marginally higher under Alternative 2 compared with Alternative 1. Table 3.0-14 shows that the use of some non-explosive practice munitions would increase under Alternative 2 compared to totals

under Alternative 1; the numbers of the different types of explosive munitions used under Alternative 2 are either the same or similar to totals under Alternative 1 (Table 3.0-16). Five out of the 10 different types of other military expended materials shown in Table 3.0-15 would also increase under Alternative 2; however, the increases are not substantial.

After reviewing the changes in the numbers and types of training and testing activities with the potential to increase the probability of a physical disturbance and strike, the Navy determined that potential impacts from physical disturbance and strike under Alternative 2 would be the same or similar to impacts identified under Alternative 1. Therefore, increases under Alternative 2 would have no appreciable change on the conclusions presented under Alternative 1 and in the 2015 MITT Final EIS/OEIS.

3.12.2.3.3 Impacts from Physical Disturbance and Strike Stressors Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Other military activities not associated with this Proposed Action would continue to occur. Physical disturbance and strike stressors as listed above would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing training and testing activities would result in fewer physical disturbance and strike stressors within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential for physical disturbances and strikes, but would not measurably change the number of times the public is exposed to physical disturbance and strike stressors in the Study Area.

Not conducting the proposed at-sea training and testing activities may have negative impacts on the socioeconomic resources of Guam and the CNMI. The number of jobs and types of jobs available on Guam and to a lesser extent on the CNMI may decline. The Navy and Navy personnel are an important and often stabilizing contributor to the local and regional economies. For example, vessels and associated equipment used specifically for at-sea training and testing activities would no longer be needed if all at-sea training and testing activities ceased. Consequently, the civilian and Navy personnel supporting those activities may be relocated, reassigned, or have to find other employment. The secondary effects from reducing the number of personnel who support at-sea training and testing activities could include a decline in revenue for local businesses frequented by Navy personnel and their families, such as businesses in the food services, retail, and housing sectors.

As described in Section 3.12.1 (Affected Environment), the Navy contributes to the economies of Guam and the CNMI, which includes expenditures associated with at-sea training and testing activities. If a substantial number of Navy personnel are relocated due to the elimination of training and testing activities, a portion of the 12,800 Navy personnel and their dependents (approximately 8 percent of the population) residing on Guam would potentially be relocated off the island. A reduction in the population and Navy funding for training and testing activities may lessen the ability of military funding to stabilize the economy against fluctuations in the tourism sector. Training activities that use any of the seven vessels assigned to Saipan would no longer be conducted. This may reduce the need for or usage of one or more of the vessels, leading to a reduction in the funding expended to maintain the vessels at Saipan. Based on these two examples, the economies and social communities on Guam and the CNMI would be impacted to some degree if the proposed at-sea training and testing activities were not conducted.

3.12.2.4 Secondary Stressors

Secondary stressors resulting in indirect impacts on socioeconomic resources are discussed in Section 3.12.3.4 (Secondary Impacts from Availability of Resources) of the 2015 MITT Final EIS/OEIS. A secondary stressor, as defined in this section, is a stressor that has the potential to affect a socioeconomic resource as a result of a direct effect on another non-socioeconomic resource. For example, if a training activity has the potential to affect certain types of fish, and those same fish are part of an economically important fishery, then the effect of the stressor on those fish species could have an indirect, or secondary, effect on the socioeconomic resource of commercial fishing.

3.12.2.4.1 Secondary Impacts from Availability of Resources Under Alternative 1 and Alternative 2

The secondary stressor "resource availability" pertains to the potential for loss of fisheries resources, including some invertebrates, within the Study Area, which is relevant to commercial, recreational, and traditional fishing practices as well as tourism. Additionally, impacts on marine mammal populations would have the potential to impact revenue for whale watching businesses if a substantial number of whales were to leave the area. Analysis in Sections 3.4 (Marine Mammals), 3.8 (Marine Invertebrates), and 3.9 (Fishes) determined, however, that no population level impacts on marine species are anticipated from the proposed training and testing activities. For these reasons, there would be no secondary impacts on commercial or recreational fishing, traditional fishing practices, or tourism in the Study Area under Alternative 1 or Alternative 2.

3.12.2.4.2 Secondary Impacts from Availability of Resources Under the No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Other military activities not associated with this Proposed Action would continue to occur. Secondary stressors impacting resource availability as listed above would not be introduced into the marine environment. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.

Discontinuing training and testing activities would result in fewer secondary stressors from the availability of resources within the marine environment where training and testing activities have historically been conducted. Therefore, discontinuing training and testing activities under the No Action Alternative would lessen the potential for secondary stressors, but would not measurably improve the availability of resources associated with secondary impacts on socioeconomic resources in the Study Area.

Not conducting the proposed at-sea training and testing activities may have negative impacts on the socioeconomic resources of Guam and the CNMI. The number of jobs and types of jobs available on Guam and to a lesser extent on the CNMI may decline. The Navy and Navy personnel are an important and often stabilizing contributor to the local and regional economies. For example, vessels and associated equipment used specifically for at-sea training and testing activities would no longer be needed if all at-sea training and testing activities ceased. Consequently, the civilian and Navy personnel supporting those activities may be relocated, reassigned, or have to find other employment. The secondary effects from reducing the number of personnel who support at-sea training and testing activities could include a decline in revenue for local businesses frequented by Navy personnel and their families, such as businesses in the food services, retail, and housing sectors.

As described in Section 3.12.1 (Affected Environment), the Navy contributes to the economies of Guam and the CNMI, which includes expenditures associated with at-sea training and testing activities. If a substantial number of Navy personnel are relocated due to the elimination of training and testing

activities, a portion of the 12,800 Navy personnel and their dependents (approximately 8 percent of the population) residing on Guam would potentially be relocated off the island. A reduction in the population and Navy funding for training and testing activities may lessen the ability of military funding to stabilize the economy against fluctuations in the tourism sector. Training activities that use any of the seven vessels assigned to Saipan would no longer be conducted. This may reduce the need for or usage of one or more of the vessels, leading to a reduction in the funding expended to maintain the vessels at Saipan. Based on these two examples, the economies and social communities on Guam and the CNMI would be impacted to some degree if the proposed at-sea training and testing activities were not conducted.

3.12.3 Public Scoping Comments

The public raised a number of issues during the scoping period in regard to socioeconomic resources. The issues are summarized in the list below.

- **Restricting the ability of American citizens to move between islands to fish, recreate, or for general travel** – Access to certain areas of the Study Area is restricted during potentially hazardous training and testing activities to ensure the safety of the public and military personnel. Most areas (with the notable exception of the 3 NM danger zone around FDM) are only restricted on a temporary basis and are accessible to the public when not in use by the military. See Section 3.12.2.1 (Commercial Transportation and Fishing) and 3.12.3.1 (Accessibility [to the Ocean and Airspace]) in the 2015 MITT Final EIS/OEIS.
- **Concerns regarding negative effects of sonar testing on swimming and diving in the waters off Guam and the CNMI** – The Navy follows established standard operating procedures when conducting training and testing activities with sonar to ensure that swimmers, divers, and any anyone else who might be in the water are safe (see Section 2.3.3, Standard Operating Procedures). The Navy avoids using sonar near popular swimming and diving sites. See Section 3.12.2.1 (Accessibility [to the Ocean and Airspace]) and Section 3.12.2.4 (Tourism) in the in the 2015 MITT Final EIS/OEIS. Also, refer to Section 3.13 (Public Health and Safety) for information on Navy procedures for protecting swimmers and divers.
- **Improve safety for fishermen by issuing NOTMARs in advance of military activities and posting NOTMARs at local marinas for boaters to view and be warned** – The Navy requests that the U.S. Coast Guard issues NOTMARs to make fishers and other members of the public aware of upcoming training and testing activities that would limit public access to areas of the Study Area. The Navy continues to search for new ways to communicate important information to the public and now posts information about upcoming closures to several Navy Facebook pages. See Section 3.12.2.1 (Commercial Transportation and Shipping) and 3.12.3.1 (Accessibility [to the Ocean and Airspace]) in the 2015 MITT Final EIS/OEIS. Also, refer to Section 3.13 (Public Health and Safety) for information on Navy procedures for protecting mariners.
- **Request additional and more frequent NOTMARs during military training (e.g., broadcast every two hours, posters at boat harbors, Facebook, and direct communication with fishers)** – The Navy requests that the U.S. Coast Guard issues NOTMARs to make fishers and other members of the public aware of upcoming military activities that would limit public access to areas of the Study Area. In addition to posting NOTMARs, emails are sent to Guam and CNMI local mayors, Guam legislators, resources agencies, and fishers. The distribution was developed by JRM and local stakeholders. In addition, notices are sent to the National Oceanic and

Atmospheric Administration, local cable channels, and emergency management offices. The Navy continues to search for new ways to communicate important information to the public and now posts information about upcoming closures to several Navy Facebook pages. See Section 3.12.2.1 (Commercial Transportation and Shipping) and 3.12.3.1 (Accessibility [to the Ocean and Airspace]) in the 2015 MITT Final EIS/OEIS.

- **Training and testing activities disturbing pelagic and economically important fish and causing them to leave the Study Area** – The analysis in Section 3.9 (Fishes) concludes that there would be no population level effects on any fish species, including economically important species. See Section 3.12.2.1 (Accessibility [to the Ocean and Airspace]) and Section 3.12.2.4 (Secondary Stressors). Also refer to Sections 3.8 (Marine Invertebrates) and 3.9 (Fishes) in this SEIS/OEIS and in the 2015 MITT Final EIS/OEIS for detailed analysis explaining why population level effects are not likely to occur.
- **Direct and cumulative impacts on recreational and commercial fishing and transport between the islands due to the location of restricted areas** – Impacts on commercial and recreational fishing and transportation between islands are not expected to have substantial socioeconomic impacts on recreational and commercial fishing in the region. Upon completion of training and testing activities, restrictions on certain areas (e.g., Apra Harbor small arms firing range) are lifted and fishers would be able to return to fish and transit through the area. To help manage competing demands and maintain public access in the Study Area, the military conducts its offshore operations in a manner that reduces restrictions on commercial fishing. Military vessels, fishers, and recreational users operate within the area together, and keep a safe distance between each other. Military participants would relocate as necessary to avoid conflicts with non-participants. Only specific areas within Study Area have been designated as danger zones or restricted areas. See Section 3.12.2.1 (Commercial Transportation and Shipping) and 3.12.3.1 (Accessibility [to the Ocean and Airspace]) in the 2015 MITT Final EIS/OEIS. Also See Chapter 4 (Cumulative Impacts) for a discussion on potential cumulative impacts from past, present, and future Navy and other military activities in the region occurring simultaneously with civilian activities.
- **Socioeconomic effects on recreational and traditional fishers from limiting access to fishing sites, specifically because of restricted areas** – Access to certain areas of the Study Area is restricted during potentially hazardous training and testing activities to ensure the safety of the public and military personnel. Most areas (with the notable exception of the 3 NM danger zone around FDM) are only restricted on a temporary basis and are accessible to the public when not in use by the military. The Navy understands that individual fishers may be temporarily impacted by a particular event. The Navy will continue to communicate with the public through multiple means to alert fishers and other members of the public of upcoming activities that may limit access to fishing sites. Monitoring NOTMARs and other announcements for scheduled training and testing activities should avoid any conflicts and reduce socioeconomic impacts on fishers. See Section 3.12.2.1 (Accessibility [to the Ocean and Airspace]). See also 3.12.3.1.1.2 (Commercial and Recreational Fishing) and Section 3.12.3.1.1.3 (Subsistence Use) in the 2015 MITT Final EIS/OEIS.
- **Loss of income and revenue from loss of access to prime fishing grounds around FDM with the expansion of the restricted area around FDM** – Access to certain areas of the Study Area is temporarily restricted during potentially hazardous training and testing activities to ensure the

safety of the public and military personnel. Areas within in 3 NM of FDM have been permanently restricted to maintain public safety. Even when hazardous activities are not occurring at FDM, the potential occurrence of unexploded ordnance in waters surrounding the island is a constant threat to public safety. Transiting between Guam, Saipan, Tinian, and Rota to islands located north of FDM (e.g., the Islands Unit) would potentially be impacted by designating a 12 NM danger zone around the FDM and limiting access to the area when the range is in use. A study conducted by the Pacific Islands Fisheries Science Center on fishing activity in the Islands Unit of the Marianas Trench Marine National Monument reported that vessels have historically traveled from the southern Mariana Islands to the Islands Unit (defined as the islands of Uracas, Maug, and Asuncion) an average of 3.8 times per year over the 30-year period from the years 1979 through 2009 (Kotowicz & Richmond, 2013). Travel to other islands north of FDM (e.g., Anatahan and Pagan) may be more frequent; however, the study did not address islands located south of the Islands Unit. Considering that trips between the populated island south of FDM and the Islands Unit would be relatively infrequent, the probability of military activities that temporarily limit access to ocean areas within 12 NM of FDM interfering with trips to the Islands Unit would be low. The most direct route between Saipan (the northernmost populated island) and Anatahan (the closest island north of FDM) passes more than 12 NM west of FDM. Furthermore, the military will continue to announce when FDM is not in use in addition to notifying mariners of planned activities via NOTMARs and NOTAMs at FDM as the Navy has done in the past, which will enable mariners to better plan trips to islands north of FDM, including the Islands Unit. See Section 3.12.3.1.1.2 (Commercial and Recreational Fishing) in the 2015 MITT Final EIS/OEIS.

- **Increased time and cost to transit around FDM because of the expanded restricted area around FDM** – Transiting between Guam, Saipan, Tinian, and Rota to islands located north of FDM (e.g., the Islands Unit) would potentially be impacted by designating a 12 NM danger zone around the FDM and limiting access to the area when the range is in use. A study conducted by the Pacific Islands Fisheries Science Center on fishing activity in the Islands Unit of the Marianas Trench Marine National Monument reported that vessels have historically traveled from the southern Mariana Islands to the Islands Unit (defined as the islands of Uracas, Maug, and Asuncion) an average of 3.8 times per year over the 30-year period from the years 1979 through 2009 (Kotowicz & Richmond, 2013). Travel to other islands north of FDM (e.g., Anatahan and Pagan) may be more frequent; however, the study did not address islands located south of the Islands Unit. Considering that trips between the populated island south of FDM and the Islands Unit would be relatively infrequent, the probability of military activities that temporarily limit access to ocean areas within 12 NM of FDM interfering with trips to the Islands Unit would be low. The most direct route between Saipan (the northernmost populated island) and Anatahan (the closest island north of FDM) passes more than 12 NM west of FDM. Furthermore, the military will continue to announce when FDM is not in use in addition to notifying mariners of planned activities via NOTMARs and NOTAMs at FDM as the Navy has done in the past, which will enable mariners to better plan trips to islands north of FDM, including the Islands Unit. See Section 3.12.3.1.1.2 (Commercial and Recreational Fishing) in the 2015 MITT Final EIS/OEIS.
- **Request for direct compensation or development of fishery infrastructure as mitigation for loss of access to fishing grounds** – As presented in Section 3.12 (Socioeconomic Resources) of the MITT Final EIS/OEIS, the military has been conducting training and testing activities within the Study Area for decades, and has taken and will continue to take measures to prevent

interruption of commercial and recreational fishing activities. The Navy limits fishing activities in only a small portion of the Study Area and only to the extent necessary to accommodate the training and testing activities. The military does not limit fishing activities from occurring in areas of the Study Area that are not being used for training and testing activities. To mitigate impacts to fishers and minimize potential interactions between military and civilian activities, the Navy will continue to publish scheduled training event times and locations on publicly accessible Navy websites and through U.S. Coast Guard issued Notices to Mariners, up to 6 months in advance of planned events. Press releases have been continuously provided to Guam and CNMI Mayors' offices and interested fishing organizations and fishers. When feasible, the military will use these same means of communication to notify the public of changes to previously published restrictions. Advanced planning on behalf of the military and effective communication of the military's plans attempt to maximize accessibility to desirable fishing locations and minimize the effect on commercial and recreational fishing activities. To the extent practicable, the Navy will continue to limit training and testing activities in and around the location of fish aggravating devices. The Navy will continue to consult with the public and local fishers on issues affecting commercial and recreational fishing in order to limit potential impacts associated with military activities. The issue of compensation to impacted fisheries is beyond the scope of the Navy's analysis in this SEIS/OEIS.

- **Displacement of fishermen from traditional fishing grounds** – Access to certain areas of the Study Area is restricted during potentially hazardous training and testing activities to ensure the safety of the public and military personnel. Most areas (with the notable exception of the 3 NM danger zone around FDM) are only restricted on a temporary basis and are accessible to the public when not in use by the military. See Section 3.12.2.1 (Accessibility [to the Ocean and Airspace]). See also Section 3.12.3.1 (Accessibility [to the Ocean and Airspace]) and Section 3.12.3.1.1.3 (Subsistence Use) in the 2015 MITT Final EIS/OEIS.
- **Impacts on traditional fishing practices** – Traditional fishers, including subsistence fishers, typically fish from the shore or from small vessels within 3 NM of shore. The majority of training and testing activities occur in offshore waters (beyond 3 NM and in many cases beyond 12 NM) where traditional fishing typically does not occur, reducing any potential overlap with military activities. The Navy understands that individual fishers may be temporarily impacted by a particular event. The Navy will continue to communicate with the public through multiple means to alert traditional fishers of upcoming activities that may limit access to popular fishing sites. Monitoring NOTMARs and other announcements for scheduled training and testing activities should avoid any conflicts and reduce socioeconomic impacts on traditional fishers. See Section 3.12.2.1 (Accessibility [to the Ocean and Airspace]). See also Section 3.12.3.1 (Accessibility [to the Ocean and Airspace]), Section 3.12.3.1.1.3 (Subsistence Use), and 3.12.3.3.1.1 (Commercial and Recreational Fishing/Subsistence Use) in the 2015 MITT Final EIS/OEIS.
- **Impacts from explosives on fish stocks and traditional fishers who rely on those stocks** – The analysis in Section 3.9 (Fishes) concludes that there would be no population-level effects on any fish species, including economically important species. See Section 3.12.2.4 (Secondary Stressors) and Section 3.12.3.1.1.3 (Subsistence Use) in the 2015 MITT Final EIS/OEIS.

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