2 Description of the Proposed Action and Alternatives

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Navy proposes to implement actions within the Alaska Training Areas (ATA) to:

- Increase training activities from current levels as necessary to support Fleet exercise requirements to include the use of active sonar; and
- Accommodate new training requirements associated with force structure changes and introduction of new weapons and systems to the Fleet.

The No Action Alternative is required by regulations of the Council on Environmental Quality (CEQ) as a baseline against which the impacts of the Proposed Action are compared. In this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS) (hereafter referred to as "EIS/OEIS"), the No Action Alternative is represented by baseline training activities at current levels (one joint force exercise occurring over a maximum time period of 14 days during summer months [April through October]).

The Proposed Action would result in selectively focused but critical increases in training to address training shortfalls, as necessary to ensure the ATA supports Navy training and readiness objectives.

Actions to support current, emerging, and future training activities in the ATA will be evaluated in this EIS/OEIS. These actions include:

- Increasing the number of training activities from current levels as necessary to support Fleet exercise requirements (that could last up to 21 days between April and October);
- Conducting training in the Primary Mission Areas (PMARs) including Anti-Air Warfare (AAW), Anti-Surface Warfare (ASUW), Anti-Submarine Warfare (ASW), Naval Special Warfare (NSW), Strike Warfare (STW), and Electronic Combat (EC). Conduct of training may include that necessary for newer systems, instrumentation, and platforms, including the EA-18G Growler aircraft, Guided Missile Submarines (SSGN), P-8 Poseidon Multimission Maritime Aircraft (MMA), Guided Missile Destroyer (DDG) 1000 (Zumwalt Class) destroyer, and several types of Unmanned Aerial Systems (UASs);
- Accommodating training enhancement instrumentation, to include the use of a Portable Undersea Tracking Range (PUTR);
- Conducting an additional Carrier Strike Group (CSG) exercise during the months of April through October which could also last up to 21 days (first CSG exercise being part of the baseline No Action Alternative); and
- Conducting a Sinking Exercise (SINKEX) during each summertime exercise (a maximum of two) in the TMAA.

This chapter includes the following major topical subsections: Section 2.1 describes the components of the ATA, and Sections 2.2 through 2.6 describe the major elements of the Proposed Action and alternatives to the Proposed Action, including the No Action Alternative.

2.1 DESCRIPTION OF THE ALASKA TRAINING AREAS

Military activities in the ATA occur:

- In the Gulf of Alaska (GOA) Temporary Maritime Activities Area (TMAA) to include: the ocean surface; under the ocean surface; and in the air.

- In the inland Special Use Airspace (SUA) areas of the United States (U.S.) Air Force (Air Force) to include: Restricted Airspace; Military Operations Areas (MOAs); and Visual Flight Rules (VFR) Corridors.
- On the training lands of the U.S. Army (Army) to include: Restricted Areas[1]; Fort Richardson; Fort Wainwright; and the Donnelly Training Area.

Figure 2-1 depicts the components of the ATA.

2.1.1 Gulf of Alaska Temporary Maritime Activities Area

The TMAA is a temporary area that is established in conjunction with the Federal Aviation Administration (FAA) for up to 14 days per year to support the Northern Edge exercise. The TMAA is a surface, undersea space and airspace maneuver area within the GOA for ships, submarines, and aircraft to conduct required training activities. As depicted in Figure 2-2, the TMAA is a polygon that roughly resembles a rectangle oriented from northwest to southeast, approximately 300 nautical miles (nm) (555.6 kilometers [km]) in length by 150 nm (277.8 km) in width, located south of Prince William Sound and east of Kodiak Island. With the exception of Cape Cleare on Montague Island located over 12 nm (22 km) from the northern point of the TMAA, the nearest shoreline (Kenai Peninsula) is located approximately 24 nm (44 km) north of the TMAA's northern boundary. The approximate middle of the TMAA is located 140 nm (259 km) offshore.

2.1.1.1 Airspace of the Temporary Maritime Activities Area

The SUA of the TMAA overlies the surface and subsurface training area. This overwater airspace supports the majority of aircraft training activities conducted by Navy and Joint aircraft throughout the Northern Edge exercise. This SUA extends from the ocean surface to 60,000 feet (ft) (18,288 meters [m]) above mean sea level (MSL), and encompasses 42,146 square nautical miles (nm^2) (145,482 square kilometers [km^2]) of airspace. Additionally, the TMAA overlays a majority of Warning Area (W-612), located over Blying Sound, towards the northwestern quadrant of the TMAA. A Warning Area is airspace of defined dimensions, extending from 3 nm outward from the coast of the United States, which contains activity that may be hazardous to nonparticipating aircraft. The purpose of such Warning Areas is to warn nonparticipating pilots of the potential danger. A Warning Area may be located over domestic or international waters, or both. When not included as part of the TMAA, W-612, which provides 2,256 nm^2 (8,766 km^2) of SUA, is used by the Air Force to conduct training in Anti-Air Warfare (AAW) and by the United States Coast Guard (USCG) to fulfill some of its training requirements. Air Force and USCG activities conducted as part of joint training within the TMAA are included in this EIS/OEIS analysis. No Navy training activities analyzed in this document will occur in the area of W-612 that is outside of the TMAA (Figure 2-1).

2.1.1.2 Sea Space of the Temporary Maritime Activities Area

The TMAA surface area is depicted in Figure 2-2. Total surface area of the TMAA is 42,146 nm^2 (145,482 km^2). While the sea space is ample for training, no permanent infrastructure is in place to support training (i.e., no dedicated training frequencies for communications, instrumentation for tracking and replaying of training activities, Meteorological and Oceanographic Operations [METOC] systems, or target systems). In this region of the Pacific Ocean, storms and high sea states can create challenges for

[1] Restricted Areas: An area or volume of airspace in which the local controlling authorities have determined that air traffic must be restricted (if not continually prohibited) for safety or security concerns. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles.

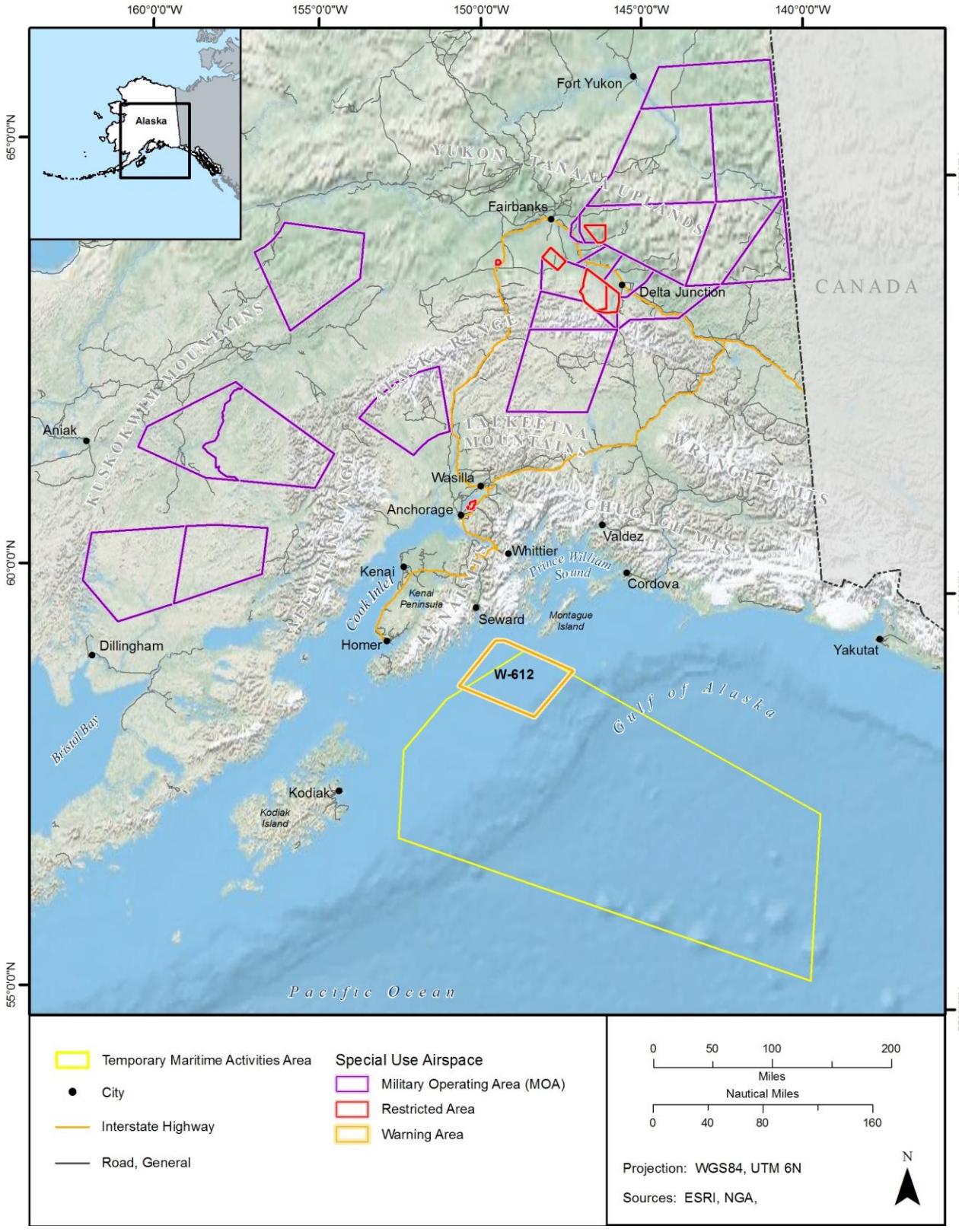


Figure 2-1: Alaska Training Areas

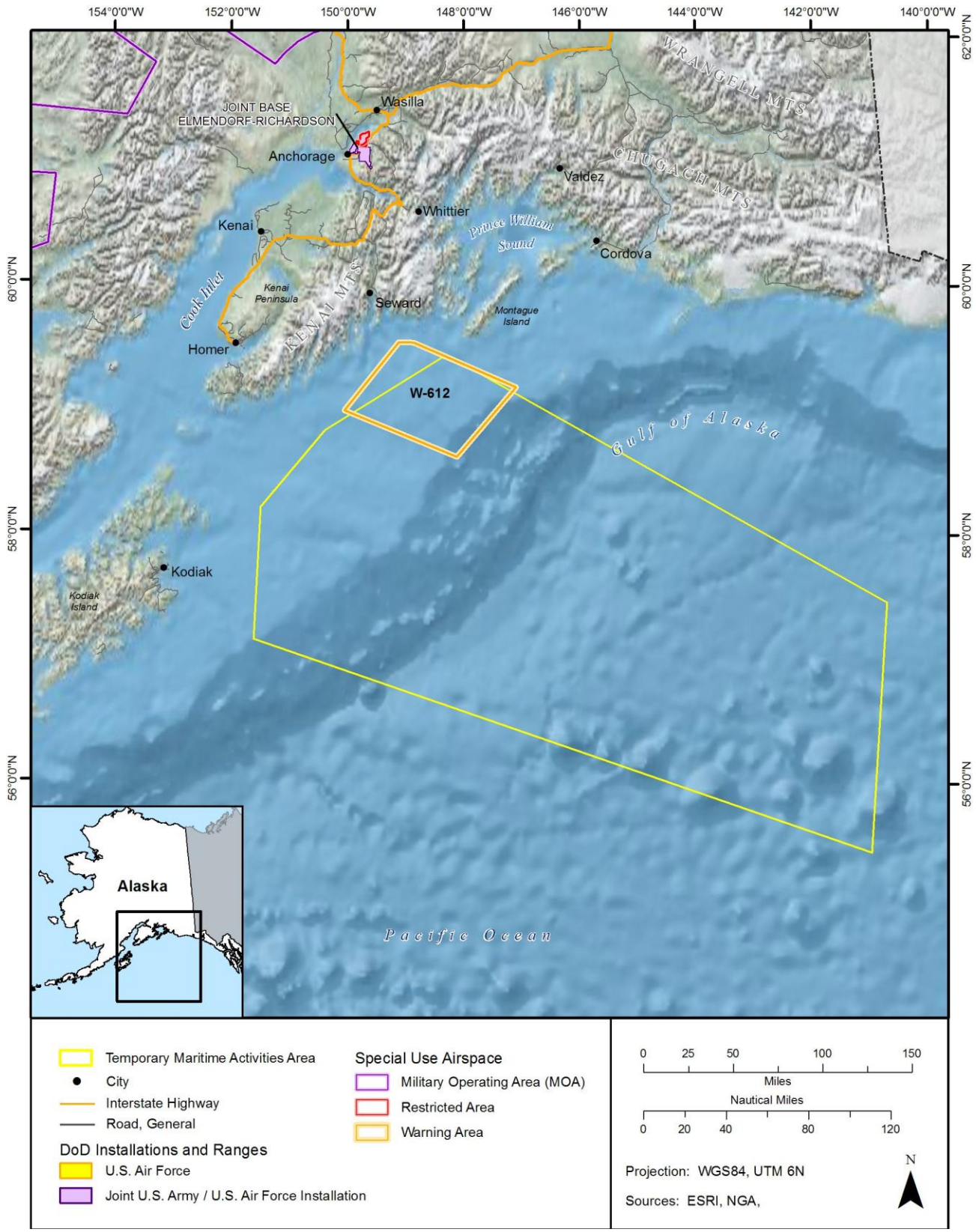


Figure 2-2: Gulf of Alaska Temporary Maritime Activities Area

surface ship training between November and March. In part as a result of these conditions, annual joint training activities are typically conducted during the summer months (April to October).

2.1.1.3 Undersea Space of Temporary Maritime Activities Area

The TMAA undersea area lies beneath the surface area, as described above and depicted in Figure 2-2. Commander Submarine Force, U.S. Pacific Fleet[2] (COMSUBPAC) manages this underwater space as transit lanes and operational areas for U.S. submarines. The undersea area extends to the seafloor. Although ASW activities are not currently conducted, the TMAA undersea operating area is mentioned here because ASW activities, to include the use of active sonar, are part of the Proposed Action.

Table 2-1 summarizes the air, sea, and undersea space of the TMAA and Figure 2-2 depicts the TMAA.

2.1.2 The Inland Special Use Airspace Training Areas of the United States Air Force

The Air Force has a vast network of SUA to conduct flight operations (Figures 2-3 and 2-4). During joint training activities, these inland SUAs are used by the Navy and joint aircraft to conduct AAW and Air-to-Ground integrated Strike Warfare (STW) training activities. In total, the Air Force has over 46,585 nm^2 (159,782 km^2/61,692 square miles [mi^2]) of SUA, of which 43,963 nm^2 (150,789 km^2/58,220 mi^2) are instrumented. The Air Force's SUAs include Restricted Areas (RAs), Military Operations Areas (MOAs), and Visual Flight Rules (VFR) corridors.

RAs are SUAs within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Activities within these areas must be confined because of their nature or limitations imposed upon aircraft operations that are not a part of those activities or both. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles. The Army RAs include:

- Oklahoma (R-2202A/B/C) air-to-ground weapons range
- Stuart Creek (R-2205) air-to-ground weapons range
- Blair Lake (R-2211) air-to-ground weapons range
- Fort Richardson (R-2203A/B/C)

Table 2-1: Air, Sea, and Undersea Areas of the Temporary Maritime Activities Area

Area Name	Airspace (nm^2)	Sea Space (nm^2)	Undersea Space (nm^2)
TMAA	42,146	42,146	42,146
W-612	2,256	2,256	2,256

[2] The Commander Submarine Force, U.S. Pacific Fleet is the principal advisor to the Commander, U.S. Pacific Fleet for submarine matters. The force provides anti-submarine warfare, anti-surface ship warfare, precision land strike, mine warfare, intelligence, surveillance, and early warning and special warfare capabilities to the U.S. Pacific Fleet and strategic deterrence capabilities to the U.S. Strategic Command.

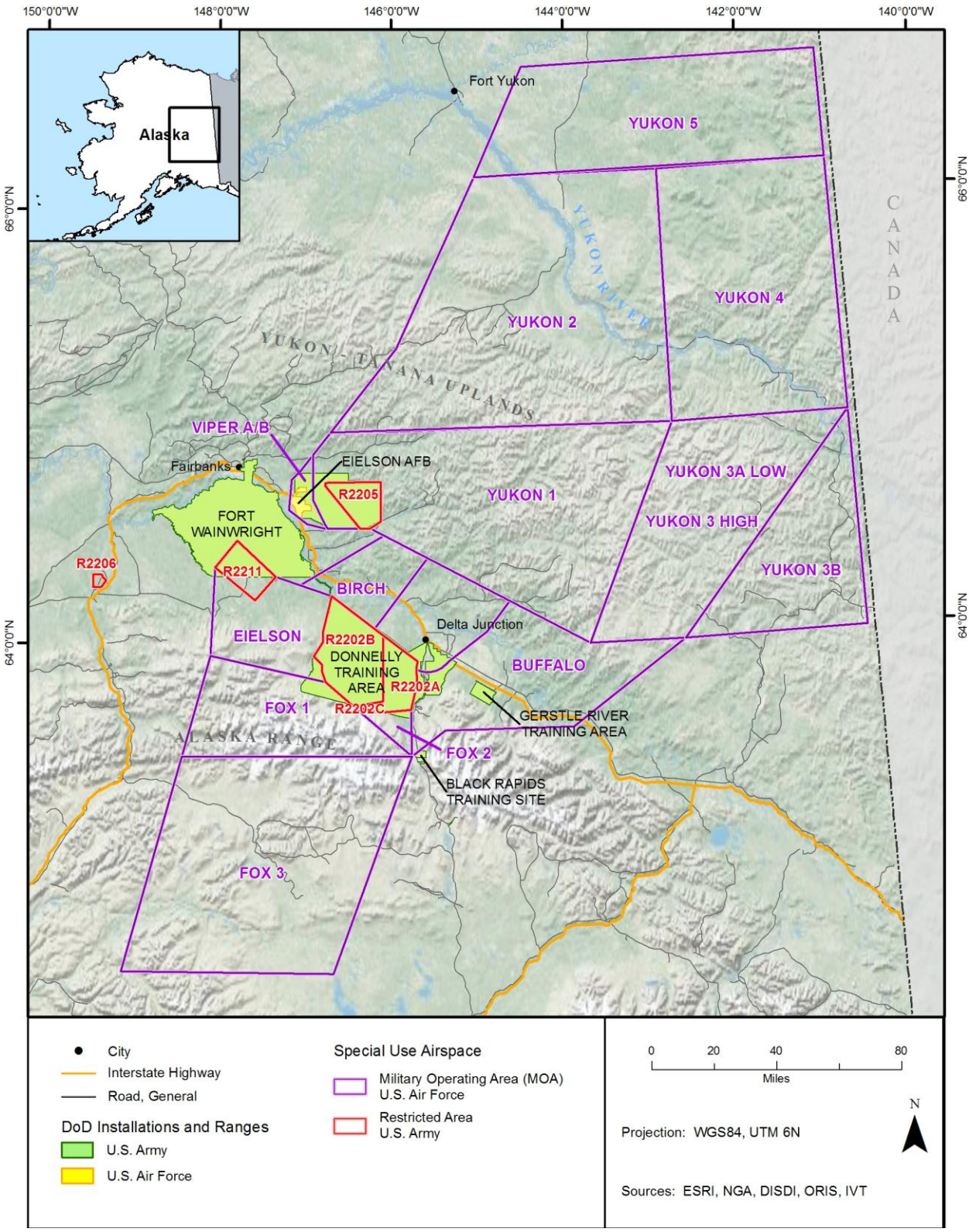


Figure 2-3: Inland Air Ranges and Training Lands of the United States Air Force and Army

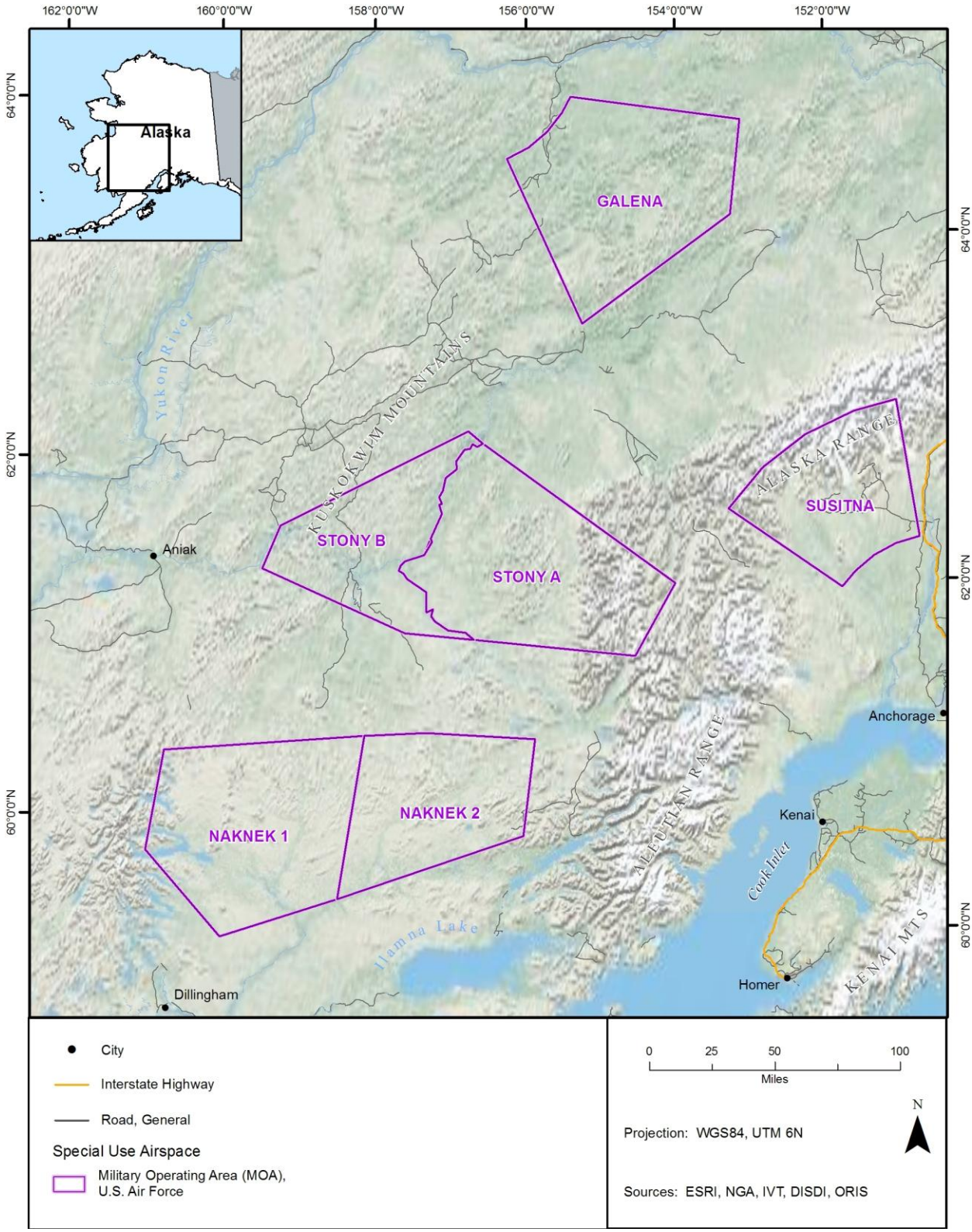


Figure 2-4: Inland Air Ranges of the United States Air Force

MOAs are SUA of defined vertical and lateral dimensions established outside of Class A airspace to separate certain nonhazardous military activities from Instrument Flight Rules (IFR) traffic in controlled airspace and to identify for VFR traffic where these activities are conducted. The Air Force MOAs include:

- Eielson
- Fox 1, 2, 3
- Falcon
- Birch
- Buffalo
- Viper A & B
- Yukon: 1, 2, 3 High, 3A Low, 3B Low, 4, 5, and 6
- Stony A and B, Galena, Susitna, Naknek 1 and 2

VFR corridors are airspace of defined vertical and lateral dimensions that permit general aviation aircraft operating on VFR flight plans to pass through a controlled airspace that would normally require an aircraft to be on an IFR flight plan. These corridors are designed to allow sightseeing of structures of interest that lie within MOA airspace, or allow general aviation aircraft to travel from airport to airport, below or through the MOA, with provided separation from military aircraft. They are typically very specific in regards to altitudes, headings, and speeds to be flown and communications to be made. The Air Force VFR corridors include:

- Richardson Highway
- Alaska Highway
- Birch

The specifics of each SUA are detailed in the Alaska MOAs EIS (USAF 1995). Although Navy AAW and STW activities occurring in Air Force SUAs are discussed in this GOA EIS/OEIS, these activities were analyzed under separate National Environmental Policy Act (NEPA) analysis by the Air Force (Alaska MOAs EIS [USAF, 1995]) for which a Record of Decision (ROD) was issued by the Air Force (USAF 1997). These documents are incorporated by reference, which, in NEPA terms means that the environmental effects of these activities are addressed in these documents. Therefore, further effects analysis of Navy training activities in Air Force airspace in this document is not required. Figures 2-3 and 2-4 depict the Inland Air Ranges of the Air Force.

2.1.3 The Training Lands of the United States Army

The Army training lands used in conjunction with the Proposed Action (Figures 2-3 and 2-5) are robust (roughly 1.3 times the size of the state of Delaware), and provide Navy and Air Force aircraft with the capability to drop live and inert weapons on instrumented ranges in large, complex flying evolutions. In addition to STW activities, the Navy can conduct other ground activities, such as Naval Special Warfare (NSW) and Personnel Recovery (PR) on Army training lands. In total, the Army has over 2,624 mi^2 (6,796 km^2) of training area, of which 1,106 mi^2 (2,866 km^2) are designated as restricted for air-to-ground ordnance. The Army's training lands include:

- Restricted Areas:
    - Donnelly Training Area (R-2202)

  - Yukon Training Area (R-2205)
  - Blair Lake Training Range (R-2211)
- Fort Richardson
- Fort Wainwright

The specifics of each land range are detailed in the Army's *Alaska Army Lands Withdrawal Renewal Final Legislative EIS* (1999) and the *Transformation of U.S. Army Alaska FEIS* (Army 2004). Although Navy STW, NSW, and PR activities occurring on Army training lands are discussed in this GOA EIS/OEIS, these activities were analyzed under separate environmental NEPA analysis by the *Army Alaska Army Lands Withdrawal Renewal Final Legislative EIS* (1999) and the *Transformation of U.S. Army Alaska FEIS* (Army 2004). Congress passed the National Defense Authorization Act (P.L. 106-65 2000) for the *Army Lands Withdrawal EIS* in 2000, which approved the Army's withdrawal of lands. Similar to the Air Force documents, these documents are incorporated by reference. Therefore, further environmental effects analysis of Navy activities on Army training lands in this document is not required. Figures 2-3 and 2-5 depict the training lands of the Army.

2.2 NAVY SONAR SYSTEMS

Navy sonar training is a significant component of overall Navy training. Recently, sonar and its potential impacts to the marine environment have become a controversial issue. This section is designed to better inform the reader about a) What is sonar; b) Why the Navy trains with sonar; and c) What sonar is used in the TMAA? The analysis of impacts of sonar to the marine environment is conducted in Chapter 3 of this EIS/OEIS.

2.2.1 What is Sonar?

Sonar, which stands for "**SO**und **N**avigation **A**nd **R**anging," is a tool that uses underwater acoustics to navigate, communicate, or detect other underwater objects. There are two basic types of sonar: active and passive.

- **Active sonar** emits pulses of sound waves that travel through the water, reflect off objects, and return to the receiver on the ship or other sonar sources. By knowing the speed of sound in water and the time for the sound wave to travel to the target and back, a sonar operator can quickly calculate distance between the ship and the underwater object. For example, active sonar systems can be used to track targets and realign internal navigation systems by identifying known ocean floor features. Whales, dolphins, and bats use the same technique, echolocation, for identifying their surroundings and locating prey.
- **Passive sonar** is a listening device that uses hydrophones (underwater microphones) that receive, amplify, and process underwater sounds. Passive sonar is used primarily to detect the presence of submarines. The advantage of passive sonar is that it places no sound in the water, and thus does not reveal the location of the listening vessel. Passive sonar can indicate the presence, character, and direction of submarines.

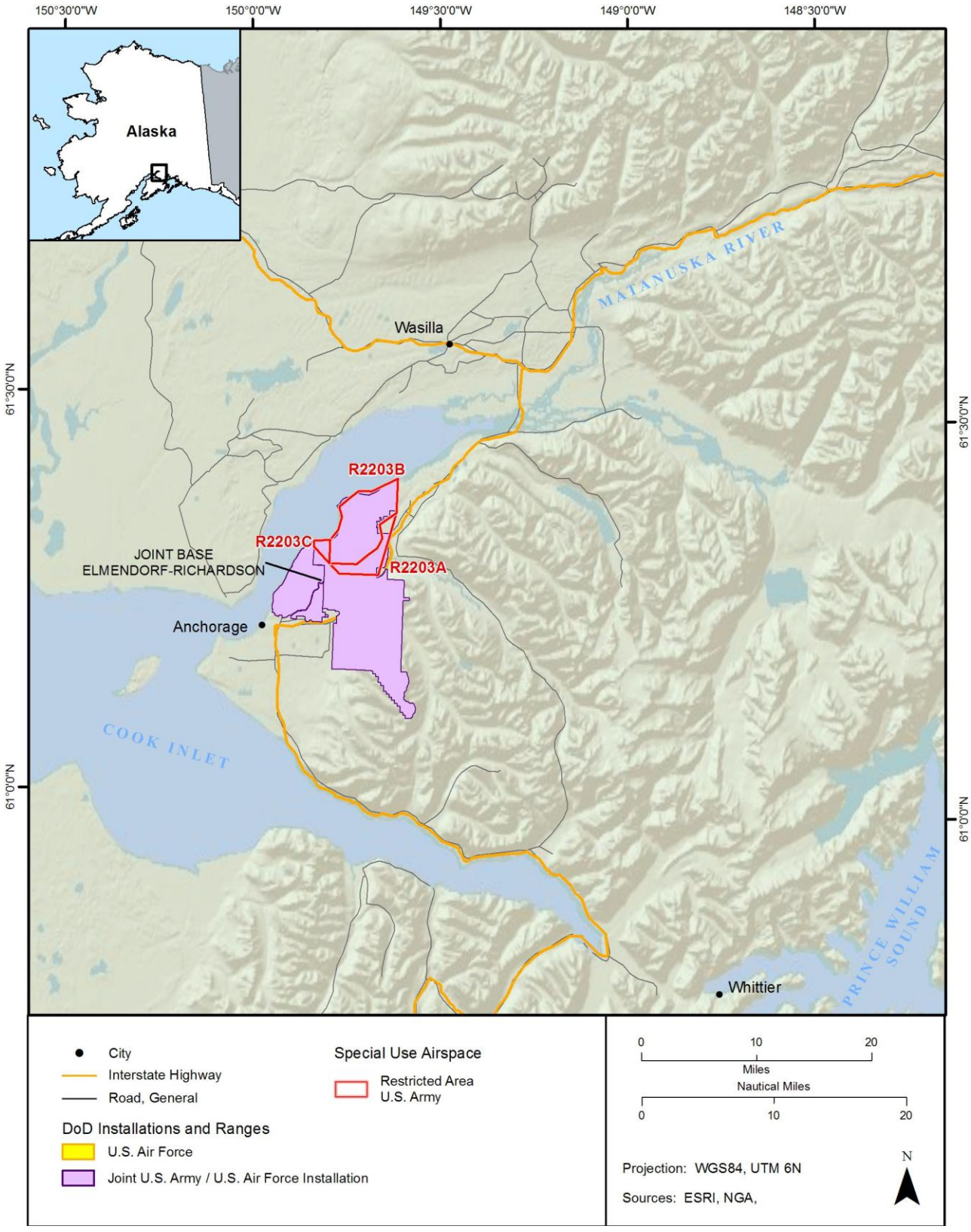
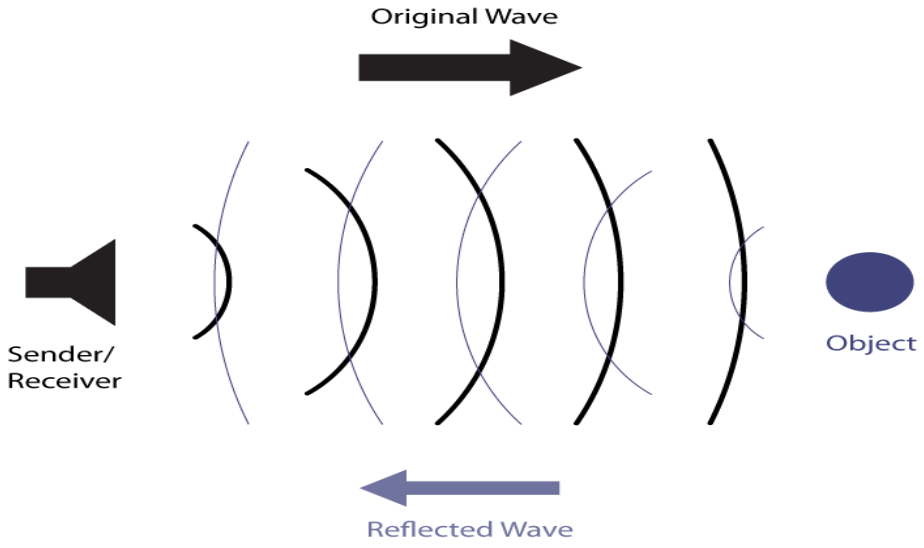


Figure 2-5: Training Lands of the United States Army

Underwater sounds in general, and sonar specifically, can be categorized by their frequency. For the analysis in this EIS/OEIS, sonar falls into one of three frequency ranges: low-frequency, mid-frequency, and high-frequency.

- **Low-frequency** sonar is sonar that emits sounds in the lower frequency range, less than 1 kilohertz (kHz). Low-frequency sonar is useful for detecting objects at great distances, as low-frequency sound does not dissipate as rapidly as higher frequency sounds. However, lower frequency sonar provides less accuracy than other sonars. There are only two ships in use by the U.S. Navy that are equipped with low-frequency sonar: both are ocean surveillance vessels operated by Military Sealift Command. While the Surveillance Towed-Array Sensor System (SURTASS) low-frequency active sonar was analyzed in a separate EIS/OEIS, the proposed action does not include the integration of LFA into the alternatives considered in this EIS/OEIS.
- **Mid-frequency** sonar uses sound in the frequency spectrum between 1 kHz and 10 kHz. With a typical range of up to 10 nm, mid-frequency sonar is the Navy's primary tool for detecting and identifying submarines. Sonar in this frequency range provides a valuable combination of range and target resolution (accuracy).
- **High-frequency** sonar uses frequencies greater than 10 kHz. Although high-frequency sonar dissipates rapidly, giving it a shorter effective range, it provides higher resolution and is useful at detecting and identifying smaller objects such as sea mines.

Modern sonar technology includes a multitude of sonar sensor and processing systems. In concept, the simplest active sonar emits sound waves, or "pings," sent out in multiple directions (i.e., is omnidirectional). Sound waves reflect off the target object and move in multiple directions (Figure 2-6). The time it takes for some of these sound waves to return to the sonar source is calculated to provide a variety of information, including the distance to the target object. More sophisticated active sonars emit an omnidirectional ping and then rapidly scan a steered receiving beam to provide directional as well as range information. Even more advanced sonars use multiple pre-formed beams to listen to echoes from several directions simultaneously and provide efficient detection of both direction and range. For more information about sonar or sound in the sea, go to www.dosits.org.



Source: ManTech-SRS, 2008

Figure 2-6: Principle of an Active Sonar

2.2.2 Why the Navy Trains with Sonar

Sea control is the foundation for the United States' global power projection. If the United States cannot command the seas and airspace above them, it cannot project power to command or influence events ashore and it cannot shape the security environment. For the last century, submarines have been the weapon of choice for countries intending on contesting another nation's control of the seas. Today, the proliferation of advanced, stealthy, nuclear and non-nuclear submarines, equipped with anti-ship weapons of increasing range and lethality, challenge the Navy's ability to guarantee the access and safety of joint forces. Effective ASW remains a remarkably and increasingly complex, high-risk warfare area that will require continued investment in research and development to counter the capabilities of current and future adversaries. The key to maintaining the Navy's ability to defend against adversary submarines is a comprehensive "at-sea" training regime to prepare our Sailors for this contingency. This training requires the use of active sonar. The skills developed during this training are perishable and require periodic refreshing, which can't be regenerated easily. If training is not as realistic as possible, the Navy will quickly lose its edge in this critical dimension of the battlefield.

Submarines have been and are likely to remain the weapon system with the highest leverage in the maritime domain. The ability to locate and track a submarine is a mission skill that must be possessed by every ASW-capable ship, submarine, and aircraft.

There are three fundamental truths about ASW. First, it is critically important to U.S. Navy strategies of sea control, power projection, and direct support to land campaigns.

Second, ASW requires a highly competent team of air, surface, and subsurface platforms to be effective in a complex and a highly variable three-dimensional environment. Each asset has unique strengths that contribute to the full spectrum of undersea, surface, airborne, and space-based ASW systems. The undersea environment – ranging from the shallows of the littoral to the vast depths of the great ocean basins and polar regions under ice – demand a multidisciplinary approach: reliable intelligence; oceanography; and surveillance and cueing of multiple sensors, platforms, and undersea weapons. Most importantly, it takes highly skilled and motivated people.

Finally, as modern submarines have become significantly quieter, passive sonar is not effective enough in tracking and prosecuting all enemy submarines. Active sonar systems, particularly medium frequency active (MFA) sonar, are key enablers of our ability to conduct effective ASW. MFA sonar is the Navy's most effective tool for locating and tracking submarines at distances that preclude effective attack on our ships. The Navy must conduct extensive integrated training, to include the use of active sonar, which mirrors the intricate operating environment present in hostile waters, particularly the littorals. This is of the highest importance to our national security and the safety of our Sailors and Marines

2.3 PROPOSED ACTION AND ALTERNATIVES

2.3.1 Alternatives Development

NEPA implementing regulations provide guidance on the consideration of alternatives in an EIS/OEIS. These regulations require the decision maker to consider the environmental effects of the Proposed Action and a range of alternatives to the Proposed Action (40 Code of Federal Regulations [C.F.R.] § 1502.14). The range of alternatives includes reasonable alternatives, which must be rigorously and objectively explored, as well as other alternatives that are eliminated from further consideration and from further detailed study. To be "reasonable," an alternative must meet the stated purpose of and need for the Proposed Action.

In addition to being required by 40 C.F.R § 1502.14(d), the No Action Alternative in environmental impact analyses is included to ensure that agencies compare the potential impacts of the proposed federal action to the known impacts of maintaining the status quo.

The No Action Alternative currently exists in the EIS/OEIS as a baseline, where the action presented represents a regular and historic level of activity in the ATA to support this type of training and exercises. In other words, the EIS/OEIS's baseline, or No Action Alternative, represents no change from current levels of training usage. The potential impacts of the current level of training activities in the ATA (defined by the No Action Alternative) are compared to the potential impacts of activities proposed under Alternative 1 and Alternative 2.

The Navy solicited input on the alternatives during public scoping meetings, and discussions with regulators and Alaska Native Tribes. Subsequently, alternatives considered in this EIS/OEIS were developed by the Navy after careful assessment by subject-matter experts, including units and commands that use the ATA, range management professionals, and Navy environmental managers and scientists.

The Navy has developed a set of criteria to use in assessing whether a possible alternative meets the purpose of and need for the Proposed Action. Each of these criteria assumes implementation of mitigation measures for the protection of natural resources, as appropriate. Any alternative considered for future analysis should support or employ the following:

1. Appropriate physical environment, including unique and complex bathymetric and oceanographic conditions. These attributes combine to provide a challenging environment for Navy forces to conduct ASW training.
    - Existence of a continental shelf, submarine canyons, and seamounts in the area;
    - Fresh water inputs into the GOA from multiple sources; and
    - Unique areas of upwelling and currents.
2. Proximity of Alaska land and sea training areas to each other to accommodate the joint training mission. The location of the TMAA is directly related to the location of permanent land and air training ranges in Alaska, and supports the mission requirement of Alaskan Command (ALCOM) to conduct joint training for Alaska-based forces and the following elements:
    - Ability to support ALCOM simulated combat conditions, and activities;
    - Infrastructure that supports a robust opposition force, which allows realistic training;
    - Land based infrastructure to support safety of naval aviation including air fields for aircraft emergency diverted landings; and
    - Facilitation of Joint Task Force training in support of PACOM.
3. Availability of sufficiently sized airspace and ranges that support tactically realistic joint training activities. This criterion allows for:
    - Fewer restrictions on supersonic flights;
    - Ability to conduct numerous types of training activities at the same time in relative proximity without compromising safety and training objectives;
    - Continuous, nonsegmented training, from launch to recovery; and
    - Support of the full spectrum of joint, allied, and coalition training.

4. Appropriate weather conditions for a cold-water environment (water temperature between 50 and 60 degrees Fahrenheit [10-15.5 degrees Celsius]) (DoN 2004) suitable for maritime activities at sea, including a sea state of three or less on the Beaufort scale (defined as a moderate sea; average wave height is 2-4 ft [0.6-1.2 m]).
5. Minimal encroachments on joint training requirements that could include, but are not limited to:
    - Low interference in the electronic spectrum to allow for unrestricted use of electronic sensors and systems; and
    - Large areas with sparse populations or low to no permanent human populations.
6. Training sustainment in support of the DoD Title 10 mandate.
7. Proximity to shipping lanes for realistic training on avoiding conflicts with air and marine traffic.

NEPA regulations require that the federal action proponent study means to mitigate adverse environmental impacts of the Proposed Action or an alternative (40 C.F.R. § 1502.16). Additionally, an EIS is to include study of appropriate mitigation measures not already included in the Proposed Action or alternatives (40 C.F.R. § 1502.14(f)). Each of the alternatives considered in this EIS/OEIS includes mitigation measures intended to reduce the environmental effects of Navy activities. Mitigation measures, such as Standard Operating Procedures (SOPs), are discussed throughout this EIS/OEIS in connection with affected resources, and are also addressed in Chapter 5.

2.3.2 Alternatives Eliminated from Further Consideration

Having identified criteria for generating alternatives for consideration in this EIS/OEIS (see Section 2.3.1), the Navy eliminated several alternatives from further consideration pursuant to 40 C.F.R. § 1502.14(a). Specifically, the alternatives described in Sections 2.3.2.1 through 2.3.2.4 were not considered further because, after careful consideration of each in light of the identified criteria and the purpose and need, the Navy determined that none of the eliminated alternatives meet the Navy's purpose of and need for the Proposed Action and satisfy all of the above listed selection criteria.

2.3.2.1 Alternative Locations

An alternate location for Navy training in the ATA that meets the purpose of and need for the Proposed Action does not exist. The proposed locale in the ATA is based on the mission of ALCOM to support the needs of military forces within Alaska and forces deploying through Alaska. ALCOM integrates military activities within Alaska to maximize the readiness of theater forces from and through Alaska in support of worldwide contingencies. The proposed locale encompasses existing training areas with unique sizes and capabilities, and training areas that have the continuity and capability to support Joint training purposes.

The ATA provides a venue in which a large Air Force contingent of aircraft can train jointly with and around a complete Navy Carrier Strike Group (CSG), comprised of an aircraft carrier and several other combatant surface ships. When the Navy conducts Joint training with Air Force assets, the training is often limited to Navy and Air Force aircraft conducting air training on Navy or Air Force ranges. In some cases, Air Force aircraft train with CSGs in other Pacific ranges; however, the size and mix of Air Force forces are significantly limited by the availability of local Air Force assets or by the cost of transporting and sustaining the aircraft and crews for the duration of an exercise. More importantly, very few airfields could meet the parking requirements of the large number of Air Force aircraft that would be involved in a robust Joint training exercise.

However, the Navy's CSG is mobile and capable of carrying out sustained operations over a long period of time. Having Navy forces transit to the TMAA for training not only adds realism, but is economically

prudent. When operating in the TMAA, CSG aircraft can reach established Air Force and Army instrumented ranges in which they can conduct air-to-ground and air-to-air training. Likewise, Alaska-based Air Force aircraft can reach the TMAA without refueling to conduct training with the CSG.

Navy training in the ATA is not limited to air-to-air and air-to-ground training. The unique and complex bathymetric and oceanographic environment in the TMAA presents a challenging ASW training opportunity. The complexity of the sea bottom, the input of freshwater into the sea, and the areas of upwelling and ocean currents combine in the TMAA like in no other training area in the Pacific Ocean. Numerous air, surface, and subsurface assets within a CSG would gain valuable experience conducting ASW training in this environment. For these reasons, alternative sites do not meet the purpose of and need for the Proposed Action and, therefore, were eliminated from further study and analysis.

2.3.2.2 Reduced Training

The Navy's requirements for training have been developed through many years of iteration to ensure Sailors and Marines achieve levels of readiness to ensure they are prepared to properly respond to the many contingencies that may occur during an actual mission. These training requirements are designed to provide the experience and proficiency needed to ensure Sailors are properly prepared for operational success. The Navy has identified training requirements to acquire war fighting proficiency. There is no "extra" training built into the Navy training program. Any reduction of training would not allow the Navy to achieve the levels of certification, proficiency and readiness required to accomplish assigned missions. For this reason, alternatives that would reduce training would not meet the purpose and need of the proposal, and therefore were eliminated from further study and analysis.

2.3.2.3 Alternate Time Frame

An alternate period in which to hold Navy training in the ATA, such as in the winter months, would not be feasible. Weather conditions in the GOA preclude conducting an integrated exercise during the winter. Winter sea conditions, storms, fog, fewer daytime hours, and other environmental conditions would lead to navigational safety concerns for both ships and airplanes involved in any winter exercise. Additionally, other services' training requirements prohibit overwater training when the water temperature decreases below an acceptable level (typical during the winter months in the GOA), as this needlessly jeopardizes the health and safety of exercise participants. Therefore, an alternate time frame would not meet the evaluation factor/screening criterion #4 for maritime activities at sea.

2.3.2.4 Simulated Training

Navy and Marine Corps training already uses computer-simulated training and conducts command and control exercises without operational forces (constructive training) whenever possible. These training methods have substantial value in achieving limited training objectives. Computer technologies provide excellent tools for implementing a successful, integrated training program while reducing the risk and expense typically associated with live military training. However, virtual and constructive training are an adjunct to, not a substitute for, live training, including live-fire training. Unlike live training, these methods do not provide the requisite level of realism necessary to attain combat readiness, and cannot replicate the high-stress environment encountered during an actual contingency situation.

The Navy and Marine Corps continue to research new ways to provide realistic training through simulation, but there are limits to realism that simulation can presently provide, most notably in dynamic environments involving numerous forces, and where the training environment is too complex to accurately model, such as sound behavior in the ocean. Specifically, one such area that would be particularly adversely affected by simulation is ASW training.

Current simulation technology does not permit ASW training with the degree of fidelity required to maintain proficiency. Basic training of sonar technicians does take place using simulators, but beyond basic levels, simulation is of limited utility. A simulator cannot match the dynamic nature of the environment, either in bathymetry, sound propagation properties, or oceanography. Specifically, coordinated unit level and Strike Group Training activities require multiple crews to interact in a variety of acoustic environments that cannot be simulated. Moreover, it is a training imperative that crews actually use the equipment they will be called upon to operate.

Sonar operators and crews must train regularly and frequently to develop the skills necessary to master the process of identifying underwater threats in the complex subsurface environment. They cannot reliably simulate this training through current computer technology because the actual marine environment is too complex. Sole reliance on simulation would deny Navy Strike Groups the ability to develop battle-ready proficiency in the employment of active sonar in the following specific areas:

- Bottom bounce and other environmental conditions;
- Mutual sonar interference;
- Interplay between ship and submarine target; and
- Interplay between ASW teams in the strike group.

Currently, these factors cannot be adequately simulated to provide the fidelity and level of training necessary to safely and effectively use active sonar. Further, like any perishable skill, employment of active sonar is a skill that must be exercised – in a realistic and integrated manner – in order to maintain proficiency. Eliminating the use of active sonar during the training cycle would cause ASW skills to atrophy, and thus would put U.S. Navy forces at risk during operations.

This alternative—substitution of simulation for live training—fails to meet the purpose of and need for the Proposed Action, and was therefore eliminated from detailed study.

2.3.3 Proposed Action and Alternatives Considered

Three alternatives are analyzed in this EIS/OEIS: 1) The No Action Alternative – current activities (no active sonar); 2) Alternative 1 – increase training activities to include the use of active sonar, and accommodate force structure changes to include new platforms, weapon systems, and training enhancement instrumentation; 3) Alternative 2 – increase training activities to include the use of active sonar, accommodate force structure changes to include new platforms, weapon systems, and training enhancement instrumentation, conduct one additional summertime CSG exercise annually, and conduct a SINKEX during each summertime exercise (a maximum of two annually) in the TMAA. The following sections contain the detailed discussion of alternatives carried forward for analysis in the EIS/OEIS.

2.4 NO ACTION ALTERNATIVE – CURRENT TRAINING ACTIVITIES WITHIN THE ALASKA TRAINING AREAS

The Navy routinely trains in the ATA for national defense purposes. Under the No Action Alternative, training activities (no active sonar) as part of large-scale joint exercises would continue at baseline levels required to execute the joint training exercise requirements (one joint force exercise occurring over an maximum time period of 14 consecutive days during summer months [April through October]). The Navy would not increase training activities above historical levels, but would continue exercises in the ATA, and specifically the TMAA, with one CSG or equivalent forces. Evaluation of the No Action Alternative in this EIS/OEIS provides a baseline for assessing environmental impacts of Alternative 1 and Alternative 2 (Preferred Alternative), as described in the following subsections. Training activities and exercises

currently conducted in the ATA are briefly described below.

Each military training activity described in this EIS/OEIS meets a requirement that can be traced ultimately to requirements from the National Command Authority.[3] Training activities in the ATA stem from large-scale joint exercises, such as Northern Edge, which may involve thousands of participants and span several days. These exercises include basic individual or unit level training events of relatively short duration involving few participants that occur simultaneously with the large-scale joint exercises.

Over the years, the tempo and types of activities have fluctuated within the ATA due to changing requirements, the introduction of new technologies, the dynamic nature of international events, advances in warfighting doctrine and procedures, and force structure changes. Such developments have influenced the frequency, duration, intensity, and location of required training. The factors influencing tempo and types of activities are fluid in nature and will continue to cause fluctuations in training activities within the ATA. Accordingly, training activity data used throughout this EIS/OEIS are a representative baseline for evaluating impacts that may result from the proposed training activities.

2.4.1 Description of Current Training Activities within the Alaska Training Areas

For purposes of analysis, training activity data used in this EIS/OEIS are organized by Navy Primary Mission Areas (PMARs). The Navy currently trains in five PMARs in the TMAA; AAW, ASUW, EC, NSW, and STW. The Navy also conducts STW, EC, and NSW training in the Air Force SUA and Army training lands of the ATA. Although discussed in this document, these inland activities and their impacts are covered under other NEPA documentation by the Air Force and Army (USAF 1995, USAF 2007, Army 1999, and Army [2004] [refer to Sections 2.1.2 and 2.1.3]). In the future, Navy requirements will mandate ASW training activities take place in the TMAA using active sonar. Summary descriptions of current training activities conducted in the TMAA and other components of the ATA are provided in the following subsections. As stated earlier, the No Action Alternative is the baseline of current training area usage, thus allowing a comparative analysis between the current tempo and proposed new uses and accelerated tempo of use.

2.4.1.1 Anti-Air Warfare (AAW) Training

In general, AAW is the PMAR that addresses combat activities by air and surface forces against hostile aircraft. Navy ships contain an array of modern anti-aircraft weapon systems, including naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled cannon for close-in point defense. Strike/fighter aircraft carry anti-aircraft weapons, including air-to-air missiles and aircraft cannons. AAW training encompasses events and exercises to train ship and aircraft crews in employment of these weapon systems against mock threat aircraft or targets. AAW training includes surface-to-air gunnery, surface-to-air and air-to-air missile exercises and aircraft force-on-force combat maneuvers.

Air Combat Maneuvers (ACM): ACM includes Basic Flight Maneuvers (BFM) where aircraft engage in offensive and defensive maneuvering against each other. During an ACM engagement, no ordnance is fired. These maneuvers typically involve two aircraft; however, based upon the training requirement, ACM exercises may involve over a dozen aircraft. For the purposes of this document, aircraft activities

[3] National Command Authority (NCA) is a term used by the United States military and government to refer to the ultimate lawful source of military orders. The term refers collectively to the President of the United States (as commander-in-chief) and the United States Secretary of Defense.

will be described by the term "sortie." A sortie is defined as a single activity by one aircraft (i.e., one complete flight from takeoff to landing).

ACM activities within the ATA are conducted in the TMAA and the inland SUA of the Air Force. These activities are primarily conducted by F/A-18 aircraft. However, for purposes of this study, ACM includes other aircraft activities conducted routinely in preparation for more advanced training flights such as ACM. These other activities include in-flight refueling, basic familiarization training, and formation flying. Additionally, Air Force F-15s, F-16s, and F/A-22s also conduct ACM in the TMAA. No ordnance is released during these exercises. When conducted in the inland SUA of the Air Force, these activities and their impacts are covered under other NEPA analyses (refer to Sections 2.1.2 and 2.1.3).

Air Defense Exercise (ADEX): ADEX is an exercise to train surface and air assets in coordination and tactics for defense of the strike group or other Naval Forces from airborne threats. The activities occur within the TMAA; however, no ordnance is fired.

Surface to Air Missile Exercise (SAMEX): During a SAMEX, surface ships engage threat missiles and aircraft with missiles with the goal of disabling or destroying the threat. One live or inert missile is expended against a target towed by a commercial air services Lear jet after two or three tracking runs. The exercise lasts about 2 hours. The BQM-74E target drone, sometimes augmented with a Target Drone Unit (TDU), is used as an alternate target for this exercise. The BQM target is a subscale, subsonic, remote controlled ground or air launched target. A parachute deploys at the end of target flight to enable recovery at sea. The Surface to Air Missile (SAM) launched can be a Rolling Airframe Missile if installed on an aircraft carrier; otherwise the SAM used is the NATO Sea Sparrow Missile or the Standard Missile. These activities occur within the TMAA.

Surface-to-Air Gunnery Exercise (GUNEX S-A): During a GUNEX S-A, a ship's gun crews engage threat aircraft or missile targets with their guns with the goal of disabling or destroying the threat. A typical scenario involving a DDG with 5-inch guns and/or a guided missile frigate (FFG) with 76 millimeter (mm) Main Battery Guns would have a threat aircraft or anti-ship missile being simulated by an aircraft towing a target (a cloth banner) toward the ship below 10,000 ft, at a speed between 250 and 500 knots (kts) (463 to 926 kilometers per hour [km/h]). Main battery guns are manned and 5-inch and/or 76mm rounds are fired at the threat with the goal of destroying the threat before it reaches the ship. This is a defensive exercise where about six rounds of 5-inch Variable Timed, Non-Fragmentation (VTNF) ammunition and/or 12 rounds of 76-mm per gun mount are fired at a target towed by a commercial air services Lear jet. The ship(s) will maneuver but will typically operate at 10 to 12 kts (18 to 22 km/h) or less during the exercise. The exercise lasts about 2 hours, which normally includes several nonfiring tracking runs followed by one or more firing runs. The target must maintain an altitude above 500 ft (152.4 m) for safety reasons, and is occasionally not destroyed during the exercise. These activities occur within the TMAA.

A typical scenario involving a DDG or FFG with 20mm Close-in-Weapon System (CIWS) is similar, except the ships involved engage the simulated threat aircraft or missile with the CIWS. CIWS-equipped ships can expend between 900 and 1,400 rounds per mount per firing run, for a total of up to five runs during the typical 2-hour exercise. The actual number of rounds expended during this exercise is dependent on the ship class, the CIWS model installed, and the available ammunition allowance.

There is also a Preventive Maintenance requirement to test fire CIWS prior to this exercise, called a Pre-action calibration firing (PACFIRE). A PACFIRE generally expends about 30 rounds per firing mount.

Air to Air Missile Exercise (AAMEX): During an AAMEX, aircraft attack a simulated threat target aircraft with air-to-air missiles with the goal of destroying the target. Air-to-air missiles (approximately half of

the missiles have live warheads and about half have an inert telemetry package) are fired from aircraft against aerial targets to provide aircrews with experience using aircraft missile firing systems and training on air-to-air combat tactics. Participating air units include fighter and fighter/attack aircraft firing a variety of air-to-air missiles. The main aerial targets are flares for heat-seeking missiles and Tactical Air Launched Decoys (TALDs) for radar-guided missiles. The targets typically are launched by other Navy aircraft that are participating in the exercise. Neither the flares nor TALDs are recovered after use. These activities occur within the TMAA. Similar activities could occur in the Air Force SUAs of the ATA, but their impacts are covered under other NEPA analyses (refer to Sections 2.1.2 and 2.1.3).

A typical scenario would involve a flight of two aircraft operating between 15,000 and 25,000 ft (4,572 and 7,620 m) and at a speed of about 450 kts (834 km/h) that approach a target from several miles away and, when within missile range, launch their missiles against the target. The missiles fired, to include the AIM-7 Sparrow, AIM-9 Sidewinder and AIM-120 AMRAAM, are not recovered. The target is either a TALD or a LUU-2B/B illumination paraflare (an illumination flare that hangs from a parachute). Both the TALDs and the paraflares are expended. These exercises last about one hour, and are conducted in the TMAA outside of 12 nm (22 km) and well above 3,000 ft (914 m).

2.4.1.2 Anti-Surface Warfare (ASUW) Training

In general, ASUW is the PMAR that addresses combat (or interdiction) activities in which aircraft, surface ships, and submarines employ weapons and sensors directed against enemy surface ships or boats. Air-to-surface ASUW is conducted by aircraft assets employing long-range attack maneuvers using precision guided munitions or aircraft cannons. ASUW also is conducted by warships employing naval guns and surface-to-surface missiles. Submarines attack surface ships using submarine-launched, anti-ship cruise missiles. Training in ASUW includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile launch events. Training generally involves expenditure of ordnance against a towed target. ASUW also encompasses maritime interdiction, that is, the interception of a suspect surface ship by a Navy ship for the purpose of boarding-party inspection or the seizure of the suspect ship.

Visit Board Search and Seizure/Vessels of Interest (VBSS/VOI): VBSS/VOI missions are the principal type of Maritime Interdiction Operations (MIO) used by naval forces. Highly trained teams of armed personnel, wearing body armor, flotation devices, and communications gear are deployed from ships at sea into small Zodiac boats or helicopters to board and inspect ships and vessels suspected of carrying contraband. Once aboard, the team takes control of the bridge, crew, and engineering plant, and inspects the ship's papers and its cargo. VBSS missions are assumed to be nonhostile, but team members are trained and prepared to deal with noncooperation at all levels. When a helicopter is involved, either to provide cover or embark the inspection party, it is considered a Helicopter Visit Board Search and Seizure. These activities occur within the TMAA.

Air-to-Surface Missile Exercise (A-S MISSILEX): A-S MISSILEX involves fixed-winged aircraft and helicopter crews launching missiles at surface maritime targets, day and night, with the goal of training to destroy or disable enemy ships or boats. These activities occur within the TMAA; however all missile launches are be simulated.

For helicopter A-S MISSILEX, one or two MH-60R/S helicopters approach and acquire an at-sea surface target, which is then designated with a laser to guide an AGM-114 Hellfire missile to the target. The laser designator may be onboard the helicopter firing the hellfire, another helicopter, or another source. The helicopter simulates launching a missile from an altitude of about 300 ft against a specially prepared target with an expendable target area on a nonexpendable platform. The platform fitted with the expendable target could be a stationary barge, a remote-controlled speed boat, or a jet ski towing a

trimaran whose infrared signature has been augmented with a heat source (charcoal or propane) to better represent a typical threat vessel. All missile firings would be simulated.

For A-S MISSILEX fired from fixed-wing aircraft, the simulated missile used is typically an AGM-84 Standoff Land Attack Missile-Expanded Response (SLAM-ER), an AGM-84 Harpoon, or an AGM-65 Maverick. A flight of one or two aircraft approach an at-sea surface target from an altitude between 40,000 ft (12,192 m) and 25,000 ft (7,620 m) for SLAM-ER or Harpoon, and between 25,000 ft (7,620 m) and 5,000 ft (1,524 m) for Maverick, complete the internal targeting process, and simulate launching the weapon at the target from beyond 150 nm (278 km) for SLAM-ER and from beyond 12 nm (22 km) for Maverick. The majority of unit level exercises involve the use of captive carry (inert, no release) training missiles; the aircraft perform all detection, tracking, and targeting requirements without actually releasing a missile. These activities occur within the TMAA and all missile launches would be simulated.

Air-to-Surface Bombing Exercise (A-S BOMBEX): During an A-S BOMBEX, maritime patrol aircraft (MPA) or F/A-18 deliver free-fall bombs against surface maritime targets, with the goal of destroying or disabling enemy ships or boats.

A flight of one or two aircraft will approach the target from an altitude of between 15,000 ft (4,570 m) to less than 3,000 ft (914 m) while adhering to designated ingress and egress routes. Typical bomb release altitude is below 3,000 ft (914 m) and within a range of 1,000 yards (yd) (914 m) for unguided munitions, and above 15,000 ft (4,572 m) and in excess of 10 nm (18 km) for precision-guided munitions. Exercises at night will normally be done with captive carry (no drop) weapons because of safety considerations. Laser designators from own aircraft or a support aircraft are used to illuminate certified targets for use with lasers when using laser guided weapons. Bombs used could include BDU-45 (inert) or MK-82/83/84 (live and inert). These activities occur within the TMAA. In the near future, the Navy will be transitioning all carrier based MK-80 series bombs to BLU 110, 111, and 117 live and inert bombs. The difference is that the BLU-series bombs contain insensitive (less likely to accidently explode) high explosives, which make them safer for carrier-based operations. All other attributes would remain the same.

Air-to-Surface Gunnery Exercise (A-S GUNEX): Strike fighter aircraft and helicopter crews, including embarked NSW personnel use guns to attack surface maritime targets, day or night, with the goal of destroying or disabling enemy ships, boats, or floating or near-surface mines.

For fixed-wing A-S GUNEX, a flight of two F/A-18 aircraft will begin a descent to the target from an altitude of about 3,000 ft (914 m) while still several miles away. Within a distance of 4,000 ft (1,219 m) from the target, each aircraft will fire a burst of about 30 rounds before reaching an altitude of 1,000 ft (305 m), then break off and reposition for another strafing run until each aircraft expends its exercise ordnance allowance of about 250 rounds from its 20mm cannon.

For rotary-wing A-S GUNEX, a single helicopter will carry several air crewmen needing gunnery training and fly at an altitude between 50 and 100 ft (15 to 30m) in a 300-ft (91-m) racetrack pattern around an at-sea target. Each gunner will expend about 200 rounds of 0.50 caliber (cal) and 800 rounds of 7.62mm ordnance in each exercise. The target is normally a noninstrumented floating object such as an expendable smoke float, steel drum, or cardboard box, but may be a remote-controlled speed boat or jet ski type target. The exercise lasts about 1 hour and occurs within the TMAA.

Surface-to-Surface Gunnery Exercise (S-S GUNEX): These exercises train surface ship crews in high-speed surface engagement procedures against mobile (towed or self-propelled) seaborne targets. Both live and inert training rounds are used against the targets. The training consists of the pre-attack phase, including locating, identifying, and tracking the threat vessel, and the attack phase in which the guns are

fired at the target. In a live-fire event, aircraft conduct a surveillance flight to ensure that the range is clear of nonparticipating ships.

For S-S GUNEX from a Navy ship, gun crews engage surface targets at sea with their main battery 5-inch and 76mm guns as well as smaller surface targets with 25mm, 0.50-caliber (cal), or 7.62mm machine guns, with the goal of disabling or destroying the threat target.

For S-S GUNEX from a Navy small boat, the weapon used is typically a 0.50-cal, 7.62mm or 40mm machine gun.

The number of rounds fired depends on the weapon used for S-S GUNEX. For 0.50-cal, 7.62mm, or 40mm ordnance, the number of rounds is approximately 200, 800, and 10 rounds respectively. For the ship main battery guns, the gun crews typically fire approximately 60 rounds of 5-inch or 76mm ordnance during one exercise. These activities occur within the TMAA.

Maritime Interdiction (MI): MI is a coordinated defensive preplanned attack against multiple sea-borne and air targets using airborne and surface assets with the objective of delivering a decisive blow to enemy forces. These exercises typically involve all the assets of the CSG and Joint forces in an attempt to neutralize the threat. Weapons firing is simulated, and the exercise occurs exclusively within the TMAA each day.

Sea Surface Control (SSC): SSC exercises involve aircraft, typically FA-18 hornets, performing reconnaissance of the surrounding battlespace. Under the direction of the Sea Combat Commander[4], the airborne assets investigate surface contacts of interest and attempt to identify, via onboard sensors or cameras, the type, course, speed, name, and other pertinent data about the ship of interest. Due to the curvature of the earth, surface assets are limited in their ability to see over the horizon. The airborne assets, due to their speed and altitude, can cover great distances in relatively short periods, and see far beyond the capabilities of the surface ship. This enables them to report contacts that cannot be seen by ships. By using airborne assets, the Sea Combat Commander, in effect, is able to see beyond the horizon and develop a clearer tactical picture well in advance. These activities occur within the TMAA.

2.4.1.3 Electronic Combat (EC) Training

In general, EC is the PMAR that aims to control the use of the electromagnetic spectrum and to deny its use by an adversary. Typical EC activities include threat avoidance training, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices to defeat tracking systems.

Electronic Combat (EC): EC exercises are conducted to prevent or reduce the effective use of enemy electronic equipment and ensure the continued use of friendly electronic equipment, including command and control capabilities. During EC training, appropriately configured aircraft fly threat profiles against ships so that the ship's crews are trained to detect electronic signatures of various threat aircraft and counter the jamming of the ship's own electronic equipment by the simulated threat.

Electronic Support (ES) provides the capability to intercept, identify, and locate enemy emitters while Electronic Attack (EA) employs tactics, such as electronic jamming, to prevent or reduce effective use of

[4] The Sea Combat Commander is the individual who has the overall responsibility for defending the CSG against surface threats.

enemy electronic equipment and command and control capability. EA and ES are subsets of EC. Typical EC activities include threat-avoidance training, signals analysis, and use of airborne and surface electronic jamming devices to defeat tracking radar systems. During these exercises, aircraft, surface ships, and submarines attempt to control critical portions of the electromagnetic spectrum used by threat radars, communications equipment, and electronic detection equipment to degrade or deny the enemy's ability to defend its forces from attack and/or recognize an emerging threat early enough to take the necessary defensive actions. These activities occur within the TMAA. Additionally, this activity can occur in and on the Air Force SUA and Army land ranges of ATA. When conducted in the Air Force SUA and Army land ranges, these activities and their impacts are covered under other NEPA analyses (refer to Sections 2.1.2 and 2.1.3).

Chaff Exercise (CHAFFEX): Ships, fixed-winged aircraft, and helicopters deploy chaff to disrupt threat targeting and missile guidance radars and to defend against an attack. The chaff exercise trains aircraft in the use and value of chaff to counter an enemy threat. Radio frequency chaff is an electronic countermeasure designed to reflect radar waves and obscure aircraft, ships, and other equipment from radar tracking sources. Chaff is released or dispensed from military vehicles in cartridges or projectiles that contain millions of chaff fibers. Chaff is composed of an aluminum alloy coating on glass fibers of silicon dioxide. These aluminum-coated glass fibers (about 60 percent silica and 40 percent aluminum by weight) range in lengths of 0.8 to 7.5-cm with a diameter of about 40 micrometers. When deployed, a diffuse cloud of fibers undetectable to the human eye is formed. Chaff is a very light material that can remain suspended in air anywhere from 10 minutes to 10 hours. Chaff is employed for a number of different tactical reasons, but the end goal is to create a target from the chaff that will lure enemy radar and weapons system away from the actual friendly platform.

Chaff may be employed offensively, such as before a major strike to "hide" inbound striking aircraft or ships, or defensively in reaction to being detected by an enemy targeting radar. Defensive chaff training is the most common exercise used for training both ships and aircraft. In most cases, the chaff exercise is training for the ship or aircraft that actually deploys the chaff, but it is also a very important event to "see" the effect of the chaff from the "enemy" perspective so that radar system operators may practice corrective procedures to "see through" the chaff jamming, so exercises are often designed to take advantage of both perspectives. These activities occur within the TMAA. Additionally, this activity can occur in and on the Air Force SUA and Army land ranges of ATA. When conducted in the Air Force SUA and Army land ranges, these activities and their impacts are covered under other NEPA analyses (refer to Sections 2.1.2 and 2.1.3).

Counter Targeting: A Counter Targeting exercise is a coordinated, defensive activity utilizing surface and air assets, that attempts to use jamming and chaff to show a false force presentation to inbound surface-to-surface platforms. During these exercises, EA-6B jamming aircraft will position itself between the CSG assets and the threat and jam the radar systems of potential hostile surface units. CSG ships will launch chaff to create false targets that saturate the threat radars return, thus masking their true position. These activities occur within the TMAA.

2.4.1.4 Naval Special Warfare (NSW) Training

In general, NSW forces (Sea, Air, Land [SEALs] and Special Boat Units [SBUs]) train to conduct military activities in five Special Operations mission areas: unconventional warfare, direct action, special reconnaissance, foreign internal defense, and counterterrorism. NSW training involves specialized tactics, techniques, and procedures, employed in training events that could include insertion/extraction activities using parachutes, rubber boats, or helicopters and other equipment.

Insertion/Extraction: Personnel approach or depart an objective area using various transportation methods and covert or overt tactics depending on the tactical situation. These exercises train forces to insert and

extract personnel and equipment day or night. There are a number of different insertion or extraction techniques that are used depending on the mission and tactical situation. NSW personnel conduct insertion/extraction exercises using helicopters and other equipment. These activities take place in existing Air Force SUA and Army training lands. When conducted in the Air Force SUA and Army land ranges, these activities and their impacts are covered under other NEPA analyses (refer to Sections 2.1.2 and 2.1.3).

2.4.1.5 Strike Warfare (STW) Training

In general, Strike Warfare is the PMAR that addresses combat (or interdiction) activities by air and surface forces against hostile land based forces and assets. STW activities include training of fixed-wing fighter/attack aircraft in delivery of precision guided munitions, nonguided munitions, rockets, and other ordnance against land targets in all weather and light conditions. Training events typically involve a strike mission with a flight of four or more aircraft. The strike mission practices attacks on "long-range targets" (i.e., those geographically distant from friendly ground forces), or close air support of targets within close range of friendly ground forces. Laser designators from aircraft or ground personnel may be employed for delivery of precision-guided munitions. Some strike missions involve no-drop events in which prosecution of targets is practiced, but video footage is often obtained by onboard sensors. Strike exercises occur on the land and air training ranges as identified in the Air Force Alaska MOAs EIS, (USAF 1995) and their impacts are covered under its environmental analysis.

Air-to-Ground Bombing Exercise (BOMBEX): Air-to-ground bombing exercises consist of fixed-winged strike fighter aircraft that deliver bombs and rockets against land targets, day or night, with the goal of destroying or disabling enemy vehicles, infrastructure, and personnel. Typically, a flight of two to four aircraft will depart the aircraft carrier and fly inland at high altitude (greater than 30,000 ft [9,144 m]). The flight will approach the inland target from an altitude of between 15,000 ft (4,572 m) to less than 3,000 ft (914 m) and, will usually establish a racetrack pattern around the target. The pattern is established in a predetermined horizontal and vertical position relative to the target to ensure that all participating aircraft follow the same flight path during their target ingress, ordnance delivery, target egress, and "downwind" profiles. This type of pattern is designed to ensure that only one aircraft will be releasing ordnance at any given time. The typical bomb release altitude is below 3,000 ft (914 m) and within a range of 1,000 yards (yd) (914 m) for unguided munitions or above 15,000 ft (4,572 m) and may be in excess of 10 nm (18 km) for precision-guided munitions. Exercises at night will normally be done with captive carry (no drop) weapons because of safety considerations. Laser designators from the aircraft dropping the bomb, a support aircraft, or ground support personnel are used to illuminate certified targets for use with lasers when using laser-guided weapons. The average time for this exercise is about 1 hour. These activities take place in the inland SUA of the Air Force and on the Army land ranges of the ATA, where their impacts are covered under other NEPA analyses (refer to Sections 2.1.2 and 2.1.3).

Personnel Recovery (PR): PR is a strike warfare activity with the purpose of training aircrews to locate, protect, and evacuate downed aviation crew members. In a hostile environment, this exercise becomes a Combat Search and Rescue (CSAR) mission. The activity can include reconnaissance aircraft to find the downed aircrew, helicopters to conduct the rescue, and fighter aircraft to perform close air support to protect both the downed aircrews and the rescue helicopters. These activities can take place throughout the ATA.

2.4.1.6 Other Training

Deck Landing Qualifications (DLQs): This mission provides training for helicopter crews to land on ships underway at sea. Perhaps the most demanding mission of any aviator is landing an aircraft aboard a ship. The mission is made even more difficult when these activities are required at night or in rough sea states. Further compounding the situation during Northern Edge exercises is the fact that aircrew from the Air

Force, Army, and U.S. Coast Guard, who do not normally perform DLQs, use this venue to practice helicopter DLQs onboard naval vessels. For safety, the Navy has strict guidelines and rules on frequency and duration between landings. As this is not a normal activity for Air Force, Army, and USCG helicopter crews, the number and duration of particular DLQs that occur during a joint training exercise can vary dramatically.

DLQ activities take place on an underway Navy or USCG ship. The activities take place in both day and night, and could involve more than one helicopter over a period of several hours. The crew that is receiving the training typically departs from a shore facility and flies out to sea to make an approach and landing aboard the ship. After the required number of landings is completed, the helicopter either remains aboard ship or departs for shore. These activities take place in the TMAA.

2.4.2 Naval Force Structure

The Navy has established policy governing the composition and required mission capabilities of deployable naval units, focused on maintaining flexibility in the organization and training of forces. Central to this policy is the ability of naval forces of any size to operate independently or to merge into a larger naval formation to confront a diverse array of challenges. Thus, individual units may combine to form a Strike Group, and Strike Groups may combine to form a Strike Force. Composition of the Strike Groups and Strike Forces is discussed in Section 2.4.2.1.

2.4.2.1 "Baseline" Naval Force Composition

Navy policy defines the "baseline" composition of deployable naval forces. The baseline is intended as an adaptable structure to be tailored to meet specific requirements. Thus, while the baseline composition of a CSG calls for a specified number of ships, aviation assets, and other forces, a given CSG may include more or fewer units, depending on their mission. The baseline naval force structures established by Navy policy for a CSG are: One Aircraft Carrier; One Carrier Air Wing consisting of four Strike Fighter squadrons, one Electronic Combat squadron, two Combat Helicopter squadrons, and two logistics aircraft; Five Surface Combatant Ships where "Surface Combatant" refers to guided missile cruisers, destroyers, and frigates, and future DDG 1000 and Littoral Combat Ship platforms; one attack submarine; and one logistic support ship.

2.4.2.2 Opposition Force Composition

To support a realistic training scenario, the Navy routinely contracts civilian vessels, such as fishing and recreational vessels, to simulate enemy targets and make up an opposition force. To support exercises in the TMAA, there are approximately nineteen contracted vessels hired to support a typical joint training exercise.

2.5 ALTERNATIVE 1 – INCREASE TRAINING ACTIVITIES TO INCLUDE ANTI-SUBMARINE WARFARE ACTIVITIES AND ACCOMMODATE FORCE STRUCTURE CHANGES

Under Alternative 1, in addition to training activities currently conducted, the ATA would support an increase in training activities designed to meet Navy and DoD current and near-term operational requirements. This increase would encompass conducting one large-scale joint force exercise, including ASW activities and the use of active sonar, occurring over a maximum time period of up to 21 consecutive days during the summer months (April through October). Alternative 1 would include basic individual or unit level training events of relatively short duration occurring simultaneously with the large-scale joint force exercise. Alternative 1 would also accommodate increases in training activities due to force structure changes associated with the introduction of new weapon systems, vessels, aircraft, and training instrumentation into the Fleet. Training activities associated with force structure changes would be implemented for the EA-18G Growler, SSGN, P-8 MMA, DDG 1000 (Zumwalt Class), and UASs.

Force structure changes associated with new weapons systems would include new types of sonobuoys. Force structure changes associated with new training instrumentation include the use of a Portable Undersea Tracking Range (PUTR) (refer to Section 2.5.3.3).

2.5.1 Description of Training Activities and Levels

Table 2-5 identifies the baseline and proposed increases in activities in the ATA if Alternative 1 were to be implemented.

2.5.2 Anti-Submarine Warfare (ASW) Training

ASW Tracking Exercise (TRACKEX) trains aircraft, ship, and submarine crews in tactics, techniques, and procedures for search, detection, localization, and tracking of submarines with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. A typical unit-level exercise involves one (1) ASW unit (aircraft, ship, or submarine) versus one (1) target, usually a MK-39 Expendable Mobile ASW Training Target (EMATT) (Appendix H) or a live submarine. The target may be nonevading while operating on a specified track or fully evasive. Participating units use active and passive sensors, including hull-mounted sonar, towed arrays, dipping sonar, variable depth sonar and sonobuoys for tracking. ASW activities will include the use of active sonar.

Helicopter ASW TRACKEX: A helicopter ASW TRACKEX typically involves one or two MH-60R helicopters using both passive and active sonar for tracking submarine targets. For passive tracking, the MH-60R will deploy patterns of passive sonobuoys that will receive underwater acoustic signals, providing the helicopter crew with locating information on the target. Active sonobuoys may also be used. An active sonobuoy, as in any active sonar system, emits an acoustic pulse that travels through the water, returning echoes if any objects, such as a submarine, are within the range of acoustic detection. For active sonar tracking, the MH-60R crew will rely primarily on its AQS-22 Dipping Sonar. The sonar is lowered into the ocean while the helicopter hovers within 50 ft (15m) of the surface. Similar to the active sonobuoy, the dipping sonar emits acoustic energy and receives any returning echoes, indicating the presence of an underwater object.

The target for this exercise is either an EMATT or live submarine which may be either nonevading and assigned to a specified track or fully evasive depending on the state of training of the helicopter crew. A Helicopter TRACKEX usually takes 2 to 4 hours. No torpedoes are fired during this exercise.

Maritime Patrol Aircraft (MPA)[5] *ASW TRACKEX*: During these exercises, a typical scenario involves a single MPA dropping sonobuoys, from an altitude below 3,000 ft (914 m), into specific patterns designed for both the anticipated threat submarine and the specific water conditions. These patterns vary in size and coverage area based on anticipated threat and water conditions. Typically, passive sonobuoys will be used first, so the threat submarine is not alerted. Active sonobuoys will be used as required either to locate extremely quiet submarines or to further localize and track submarines previously detected by passive buoys (see Section 2.2.1 for a discussion of passive and active sonar). The MPA will typically operate below 3,000 ft (914 m) to drop sonobuoys, will sometimes be as low as 400 ft (122 m), then it may climb to several thousand feet after the buoy pattern is deployed. The higher altitude allows monitoring the buoys over a much larger search pattern area.

[5] MPA currently refers to the P-3C Orion aircraft. The P-8 Multi-Mission Maritime Aircraft is scheduled to replace the P-3C as the Navy's Maritime Patrol Aircraft.

The target for this exercise is either an EMATT or live submarine which may be either nonevading and assigned to a specified track or fully evasive depending on the state of training of the MPA. A TRACKEX-MPA usually takes 2 to 4 hours. No torpedoes are fired during this exercise.

Extended Echo Ranging (EER) ASW Exercises: This exercise is an at-sea flying event designed to train MPA crews in the deployment and use of the EER sonobuoy systems. This system uses the SSQ-110A as the signal source and the SSQ-77 as the receiver buoy. This activity differs from the MPA ASW TRACKEX in that the SSQ-110A sonobuoy uses two explosive charges per buoy for the acoustic source. Other active sonobuoys use an electrically generated "ping."

A typical EER exercise lasts approximately 6 hours. The aircrew will first deploy 16 to 20 SSQ-110A sonobuoys and 16 to 20 passive sonobuoys in 1 hour. For the next 5 hours, the sonobuoy charges will be detonated, while the EER system analyzes the returns for evidence of a submarine. This exercise may or may not include a practice target. In the near future, the Navy will be replacing the EER sonobuoys with the Multi-static Active Coherent (MAC) sonobuoys, which are described in detail in Section 2.5.3.2.

ASW TRACKEX (Surface Ship): Surface ships operating in the TMAA would use hull-mounted active sonar to conduct ASW Tracking exercises. Typically, this exercise would involve the coordinated use of other ASW assets, to include MPA, helicopters, and other ships.

ASW TRACKEX (Submarine): During these exercises submarines use passive sonar sensors to search, detect, classify, localize, and track the threat submarine with the goal of developing a firing solution that could be used to launch a torpedo and destroy the threat submarine. However, no torpedoes are fired during this exercise.

2.5.2.1 Sonars Used in the TMAA

For the purposes of this EIS/OEIS, the term sonar refers to a system, either passive or active, used to locate underwater objects. In addition to those systems commonly referred to as sonar, there are other acoustic sources used or proposed for use by the Navy in the TMAA. For example, the MK-84 tracking pinger and the PUTR uplink transmitter are both sources of underwater sound. Although not technically sonars, they do create sound and are considered in this analysis as acoustic systems. Tables 2-2 and 2-3 list typical U.S. Navy acoustic systems and identify those that may be used during training activities conducted in the TMAA. All sources that may be used in the TMAA were analyzed for potential impacts to the marine environment.

Certain systems, because of their frequent use or high power output, were quantitatively modeled for their acoustic impacts. The acoustic systems presented in Table 2-2 have been quantitatively modeled. Table 2-3 lists the systems that have been analyzed, but not quantitatively modeled. The systems that were not modeled include systems that are typically operated at frequencies greater than 200 kHz. Because it is not used in the TMAA, low-frequency sonar was not analyzed in this EIS/OEIS.

It is important to note that, as a group, marine mammals have functional hearing ranging from 10 hertz (Hz) to 180 kHz (Southhall et al. 2007). Their best hearing sensitivities are concentrated near the middle of that range. Since active sonar sources operating at 180 kHz or higher dissipate rapidly and are at or outside the upper frequency limit of marine mammals, further consideration and modeling of these higher frequency acoustic sources are not warranted. As such, high-frequency active sonar systems in excess of 180 kHz are not analyzed in this EIS/OEIS.

Table 2-2: Acoustic Systems Quantitatively Modeled

System*	Frequency	Associated Platform	System Use/Description	Currently Used in TMAA	Proposed Use in TMAA
AN/SQS-53C	MF	Surface ship sonar (DDG/CG)	Utilized 70% in search mode and 30% in track mode.	No	Yes
AN/SQS-56	MF	Surface ship sonar (FFG)	Utilized 70% in search mode and 30% in track mode.	No	Yes
AN/SSQ-62 DICASS Sonobuoy	MF	Helicopter and MPA deployed	12 pings, 30 seconds between pings.	No	Yes
AN/AQS-13 or AN/AQS-22	MF	Helicopter dipping sonar	AN/AQS-22: 10 pings/dip, 30 seconds between pings)- also used to represent AN/AQS-13.	No	Yes
AN/SSQ-110A Explosive source Sonobuoy	Impulsive	MPA deployed	Contains two 4.1 lb charges.	No	Yes
MK-48 Torpedo	HF	Submarine	Active for 15 minutes per torpedo run – To be used during SINKEX.	No	Yes
MK-84 Pinger	HF	Submarines, Surface ships and Targets	PUTR target tracking.	No	Yes
PUTR Uplink Transmitter	MF/HF	PUTR	PUTR tracking uplink signal.	No	Yes
MK-39 EMATT	LF	Ship and aircraft deployed	Simulates a target submarine for tracking exercises	No	Yes
AN/BQQ-10	MF	Submarine Sonar	Submarine hull-mounted sonar (2 pings per hour)	No	Yes
AN/BQS-15	HF	Submarine Sonar	Submarine mine detection sonar.	No	Yes
SUS, MK-84	Selectable 3.3 or 3.5 kHz	Limited duration, system is used for communications between surface ship and submarines	Expendable buoy deployed from aircraft and ships used as a signaling device to communicate with submarines. Operating life of 70 seconds.	No	Yes

*System Descriptions are discussed within Appendix H

DDG – Guided Missile Destroyer; CG – Guided Missile Cruiser; DICASS – Directional Command-Activated Sonobuoy System; FFG – Fast Frigate; MF – Mid-Frequency; MPA – Maritime Patrol Aircraft

Table 2-3: Acoustic Systems Not Quantitatively Modeled

System	Frequency	Reason Not Modeled	System Use/Description	Currently used in TMAA	Proposed use in TMAA
AN/SQQ-32	HF	Not used in TMAA	MCM over the side system.	No	No
MK-46, MK-54 Torpedo	HF	Not used in TMAA	Surface ship and aircraft fired exercise torpedo.	No	No
AN/SLQ-25 (NIXIE)	MF	Not used in TMAA	DDG, CG, and FFG towed array.	No	No
AN/SQS-53 and AN/SQS-56 (Kingfisher)	MF	Not used in TMAA	DDG, CG, and FFG hull-mounted sonar (small object detection).	No	No
ADC MK-3 and MK-2	MF	Not used in TMAA	Submarine-fired countermeasure.	No	No
Surface Ship and Submarine Fathometer	12 kHz	System is not unique to military and operates identically to commercially available bottom sounder	Depth finder on surface ships and submarines.	Yes	Yes
SQR-19	Passive	System is a passive towed array emitting no active sonar	A listening device towed behind a surface ship.	Yes	Yes
TB-16/23/29/33	Passive	System is a passive towed array emitting no active sonar	A listening device towed behind a submarine.	Yes	Yes
AN/SSQ-53 DIFAR Sonobuoy, AN/SSQ-101 (ADAR), AN/SQS-77 (VLAD)	Passive	Sonobuoy is passive & emits no active sonar	Passive listening buoys deployed from helicopter or MPA.	No	Yes
AN/SQQ-125 (MAC) Sonobuoy	MF	MPA deployed	Replacement for AN/SSQ-110A, uses electronic, not explosive, sound source	No	Yes
AN/AQS-14/20/24	>200 kHz	System frequency outside the upper limit for marine mammals and not used in TMAA	Helicopter towed array used in MIW for the detection of mines.	No	No

Table 2-3: Acoustic Systems Not Quantitatively Modeled (continued)

System	Frequency	Reason Not Modeled	System Use/Description	Currently used in TMAA	Proposed use in TMAA
Acoustic Detection Countermeasures (MK-1, MK-2, MK-3, MK-4)	MF	Not used in TMAA	Countermeasure package deployed during some ASW events to counter torpedoes.	No	No
Unmanned Underwater Vehicles	MF/HF	Not used in TMAA	Data collection telemetry and mapping sonars may be active sources.	No	No
AN/WSQ-9; ACOMMS	MF/HF	Limited duration, system is used for communications between surface ship and submarines	Surface ship and submarine buoys – operational use of passive hydrophones and arrays and active transducers as system components used to transmit voice and data underwater for safety, data sharing, and communications.	No	Yes

ADC – Acoustic Device Countermeasure; DDG – Guided Missile Destroyer; DIFAR – Directional Frequency Analysis and Recording; FFG – Fast Frigate; HF – High-Frequency; kHz – Kilohertz; MCM – Mine Countermeasures; MF – Mid-Frequency; MIW – Mine Warfare; MPA – Maritime Patrol Aircraft

2.5.3 Force Structure Changes

The Navy will train with new ships, aircraft, and systems as they become operational in the Fleet. Several future platforms and weapon systems have been identified that are in development, and are likely to be incorporated into Navy training requirements within the 10-year planning horizon. Several of these new technologies are in early stages of development, and thus specific concepts of operations, operating parameters, or training requirements are not yet available. However, when made available, information will be incorporated into the development of the EIS/OEIS.

Specific force structure changes and their impact on training within the GOA are based on the Navy's knowledge of future requirements for the use of new platforms and weapons systems and based on the level of information available to evaluate potential environmental impacts. Therefore, this EIS/OEIS, to the extent feasible, will evaluate potential environmental impacts associated with the introduction of the following platforms and weapon systems. Should additional requirements for the use of platforms and weapon systems be needed, separate NEPA and environmental documentation would be required to analyze potential impacts.

2.5.3.1 New Platforms/Vehicles

EA-18G Growler

The EA-18G Growler is an electronic combat version of the FA-18 E/F that will replace the EA-6B Prowler. Analysis within this EIS/OEIS of any EA-6B activity also considers the potential impacts of future activities with the EA-18G. The Growler will have an integrated suite of advanced communications and EC systems that will initially be centered on the Improved Capability (ICAP) III system, but will also include tactical jamming pods, a radar receivers wingtip pods, an advanced crew station, the Airborne

Electronically Scanned Array (AESA) multimode radar, and a communications receiver and jammer. The EA-18G will have a limited self-protection capability requiring aircrews to train for offensive air-to-air missile engagements and conduct missile exercises. The advanced capabilities of the Growler will require greater standoff ranges and broader frequency spectrum access than current systems.

Guided Missile Submarine (SSGN)

Four *Ohio*-class *Trident* submarines that were previously scheduled for inactivation during Fiscal Years 2003 and 2004 were converted to SSGNs over a 5-year period ending in 2008. The primary missions of the SSGN are land attack (STW) and Special Operations Forces (SOF) insertion and support. Secondary missions are the traditional attack submarine missions of Intelligence, Surveillance, and Reconnaissance (ISR), battle space preparation, and sea control.

These ships are armed with up to 154 Tomahawk or Tactical Tomahawk land attack missiles. They have the ability to carry and support a team of 66 SOF personnel for up to 90 days as compared to 15 days for a SOF outfitted Fast Attack Submarine (SSN). Clandestine insertion and retrieval of these SOF is enhanced by the ability to host dual dry deck shelters or Advanced Seal Delivery System. Each SSGN is able to conduct a variety of peace-time, conventional deterrent and combat activities all within the same deployment. The first SSGNs became operational in Fiscal Year (FY) 2007. Their use in Alaska waters will not include the strike mission, but may involve clandestine special operations.

Although potential use of the SSGN in the TMAA is not clear, any impacts would be identical to those of the SSN; therefore no further differentiation of the SSGN in this analysis is necessary.

P-8 Poseidon Multimission Maritime Aircraft (MMA)

The P-8A Poseidon MMA is the Navy's replacement for the aging P-3 Orion aircraft. It is a modified Boeing 737-800ERX that brings together a highly reliable airframe and high-bypass turbo fan jet engine with a fully connected, state-of-the-art open architecture mission system. This combination, coupled with next-generation sensors, will dramatically improve ASW and ASUW capabilities. The MMA will ensure the Navy's future capability in long-range maritime patrol. It will be equipped with modern ASW, ASUW, and ISR sensors. In short, MMA is a long-range ASW, ASUW, ISR aircraft that is capable of broad-area, maritime, and littoral activities. Initial Operational Capability (IOC) is expected in FY 2013.

Analysis within this EIS/OEIS of any P-3 activity also considers the potential impacts of future activities with the P-8A.

The DDG-1000 Zumwalt Class Destroyer

The DDG-1000 Destroyer is the lead ship in a class of next-generation, multimission surface combatants tailored for land attack and littoral dominance, with capabilities designed to defeat current and projected threats as well as improve Strike Group defense. This class of ship is undergoing design and development, and is not expected to be introduced to the Fleet before 2012. Training activities involving this class of ship are addressed in this EIS/OEIS.

Analysis within this EIS/OEIS of surface ship activities also considers the potential impacts of future activities with the DDG-1000.

Unmanned Aerial Systems (UAS)

Fire Scout UAS: The Fire Scout UAS is a Vertical Takeoff and Landing UAS (VTUAS) designed to operate from air-capable ships, carry modular mission payloads (ordnance), and operate using the Tactical Control System and Tactical Common Data Link. It provides day/night real-time ISR and targeting as communication-relay and battlefield management capabilities to support Littoral Combat Ship (LCS)

mission areas of ASW, MIW, and ASUW. Operation of these systems could produce new requirements for the GOA in terms of airspace and frequency management. Fire Scout will be fielded in early LCS versions.

Broad Area Maritime Surveillance (BAMS) UAS: The BAMS UAS is being designed to support persistent, worldwide access through multisensor, maritime ISR providing unmatched awareness of the battlespace. It will support a spectrum of Fleet missions serving as a distributed ISR node in the overall naval environment. These missions include maritime surveillance, Battle-Damage Assessment (BDA), port surveillance and homeland security support, MIW, MI, Surface Warfare (SUW), counter drug activities, and battlespace management. The BAMS will operate at altitudes above 40,000 ft (12.2 km), above the weather, and above most air traffic to conduct continuous open-ocean and littoral surveillance of targets as small as exposed submarine periscopes. Operation of these systems could produce new requirements for range complexes in terms of airspace and frequency management. IOC is anticipated for FY09.

Navy Unmanned Combat Air System (N-UCAS): The N-UCAS (Grumman X-47B) program is a Navy effort to demonstrate the technical feasibility, military utility, and operational value of an aircraft carrier based, networked system of high performance, weaponized UASs to effectively and affordably execute 21st century combat missions, including Suppression of Enemy Air Defenses (SEAD), surveillance, and precision strike within the emerging global command, and control architecture. Operation of these systems could produce new requirements for range complexes in terms of airspace, frequency management, and target sets. IOC of these systems has not yet been established.

2.5.3.2 New Weapons Systems

Under the Proposed Action, the only weapons systems being introduced at this time that warrant evaluation in this EIS/OEIS are the sonobuoys.

Multi-Static Active Coherent (MAC) System

The proposed MAC system, previously referred to as the Advanced Extended Echo Ranging (AEER) system, is used in the same manner and for the same purpose as the EER/Improved EER (IEER) system. The MAC will use the same Air Deployed Active Receiver (ADAR) sonobuoys as the acoustic receiver and will be used for a large area ASW search capability in both shallow and deep water. However, instead of using an explosive AN/SQS-110A as an impulsive source for the active acoustic wave, the MAC system will use a battery-powered (electronic) source for the AN/SSQ 125 sonobuoy. The output and operational parameters for the AN/SSQ-125 sonobuoy (source levels, frequency, wave forms, etc.) are classified; however, this MAC sonobuoy is intended to replace the EER/IEER's use of explosives and is scheduled to be deployed in 2011.

2.5.3.3 New Training Instrumentation Technology

The Navy has identified a specific training instrumentation enhancement to optimize and adequately support required training for all missions and roles assigned to the TMAA. The proposed enhancement for the TMAA is discussed below and will be analyzed in this EIS/OEIS.

Portable Undersea Tracking Range (PUTR)

The PUTR is a self-contained, portable, undersea tracking capability that employs modern technologies to support coordinated undersea warfare training for Forward Deployed Naval Forces (FDNF). PUTR will be available in two variants to support both shallow and deep water remote activities in keeping with Navy requirements to exercise and evaluate weapons systems and crews in the environments that replicate the potential combat area. The system will be capable of tracking submarines, surface ships, weapons,

targets, and Unmanned Underwater Vehicles (UUVs) and distribute the data to a data processing and display system, either aboard ship, or at a shore site.

The PUTR would be developed to support ASW training in areas where the ocean depth is between 300 and 12,000 ft (91 and 3,657 m) and at least 3 nm (5.5 km) from land. However, for exercises occurring within the GOA, the PUTR would be deployed solely within the TMAA. This proposed project would temporarily (for the duration of the exercise) instrument an area on the seafloor from 25-100 nm^2 or smaller, and would provide high fidelity crew feedback and scoring of crew performance during ASW training activities. When training is complete, the PUTR equipment would be recovered.

No onshore construction would take place. Seven electronics packages, each approximately 3 ft (0.9 m) long by 2 ft (0.6 m) in diameter, would be temporarily installed on the seafloor by a range boat, in water depths greater than 600 ft (182 m). The anchors used to keep the electronics packages on the seafloor would be either concrete or sand bags, which would be approximately 1.5 by 1.5 ft (0.45 by 0.45 m) and would weigh approximately 300 pounds. Operation of this range requires that underwater participants transmit their locations via pingers (see "Range Tracking Pingers" below). Each package consists of a hydrophone that receives pinger signals, and a transducer that sends an acoustic "uplink" of locating data to the range boat. The uplink signal is transmitted at 8.8 kHz, 17 kHz, or 40 kHz, at a source level of 190 decibels (dB). The PUTR system also incorporates an underwater voice capability that transmits at 8-11 kHz and a source level of 190 dB. Each of these packages is powered by a D cell alkaline battery. After the end of the exercise the electronic packages would be recovered and the anchors would remain on the seafloor. No additional ASW activity is proposed as a result of PUTR use.

Range tracking pingers would be installed on ships, submarines, and ASW targets when ASW TRACKEX training is conducted on the PUTR. A typical range pinger generates a 12.93-kHz sine wave in pulses with a maximum duty cycle of 30 milliseconds (3 percent duty cycle) and has a design power of 194 dB re 1 micro-Pascal at 1 meter. Although the specific exercise, and number and type of participants will determine the number of pingers in use at any time, a maximum of three pingers and a minimum of one pinger would be used for each ASW training activity. On average, two pingers would be in use for 3 hours each during PUTR operational days.

2.6 ALTERNATIVE 2 – (PREFERRED ALTERNATIVE) INCREASE TRAINING ACTIVITIES, ACCOMMODATE FORCE STRUCTURE CHANGES, CONDUCT ONE ADDITIONAL ANNUAL EXERCISE, AND CONDUCT ONE SINKEX DURING EACH SUMMERTIME EXERCISE

Implementation of Alternative 2 would include all elements of Alternative 1 (accommodating training activities currently conducted, increasing specific training activities to include the use of active sonar, and accommodating force structure changes). In addition, under Alternative 2 the following activities would occur:

- Conduct one additional large-scale joint force exercise, occurring over a maximum time period of up to 21 consecutive days during the summer months (April through October).
- Conduct a SINKEX during each summertime exercise (a maximum of two) in the TMAA

Alternative 2 is the Preferred Alternative because it would allow the greatest flexibility for Navy exercise planners to benefit from the unique joint training environment in the ATA.

2.6.1 Proposed New Activity

Alternative 2 proposes the conduct of one type of training activity that is not presently conducted in the TMAA. Under Alternative 2, this type of training would be conducted as discussed below.

2.6.1.1 Sinking Exercise (SINKEX)

A SINKEX is typically conducted by aircraft, surface ships, and submarines in order to take advantage of a full size ship target and an opportunity to fire live weapons.

A SINKEX is conducted under the auspices of a permit from the USEPA. The target is typically a decommissioned combatant or merchant ship that has been made environmentally safe for sinking according to standards set by the U.S. Environmental Protection Agency (USEPA). It is placed in a specific location that is greater than 50 nm (93 km) out to sea and in water depths greater than 6,000 ft (1,830 m) (40 C.F.R. § 229.2) so that when it sinks it will not be a navigation hazard to marine traffic.

Ship, aircraft, and submarine crews typically are scheduled to attack the target with coordinated tactics and deliver live ordnance to sink the target. Inert ordnance is often used during the first stages of the event so that the target may be available for a longer time. The duration of a SINKEX is unpredictable because it ends when the target sinks, but the goal is to give all forces involved in the exercise an opportunity to deliver their live ordnance. Sometimes the target will begin to sink immediately after the first weapon impact and sometimes only after multiple impacts by a variety of weapons. Typically, the exercise lasts for 4 to 8 hours and possibly over 1 to 2 days, especially if inert ordnance, such as 5-inch gun projectiles or MK-82 dummy bombs, is used during the first hours.

The participants and assets could include, but are not limited to:

- One full-size target ship hulk
- One to five CG, DDG, or FFG firing ships
- One to 10 F/A-18, or MPA firing aircraft and One E-2 aircraft for Command and Control
- One or two HH-60H, MH-60R/S, or SH-60B Helicopters
- One firing submarine
- One to three range clearance aircraft.

Some or all of the following weapons could be employed (see Table 2-7):

- Two HARM air-to-surface missiles
- Five Harpoon surface-to-surface or air-to-surface missiles
- One Hellfire air-to-surface missiles
- Three air-to-surface Maverick missiles
- One Penguin air-to-surface missiles
- One surface-to-air Standard Missile 1 and One surface-to-air Standard Missile 2
- 10 MK-82 General Purpose Bombs (seven live, three inert)
- Four MK-83 General Purpose Bombs
- 400 rounds 5-inch gun
- One MK-48 heavyweight submarine-launched torpedo

Figure 2-7 identifies the area with the TMAA that, based upon USEPA requirements, could support a SINKEX.

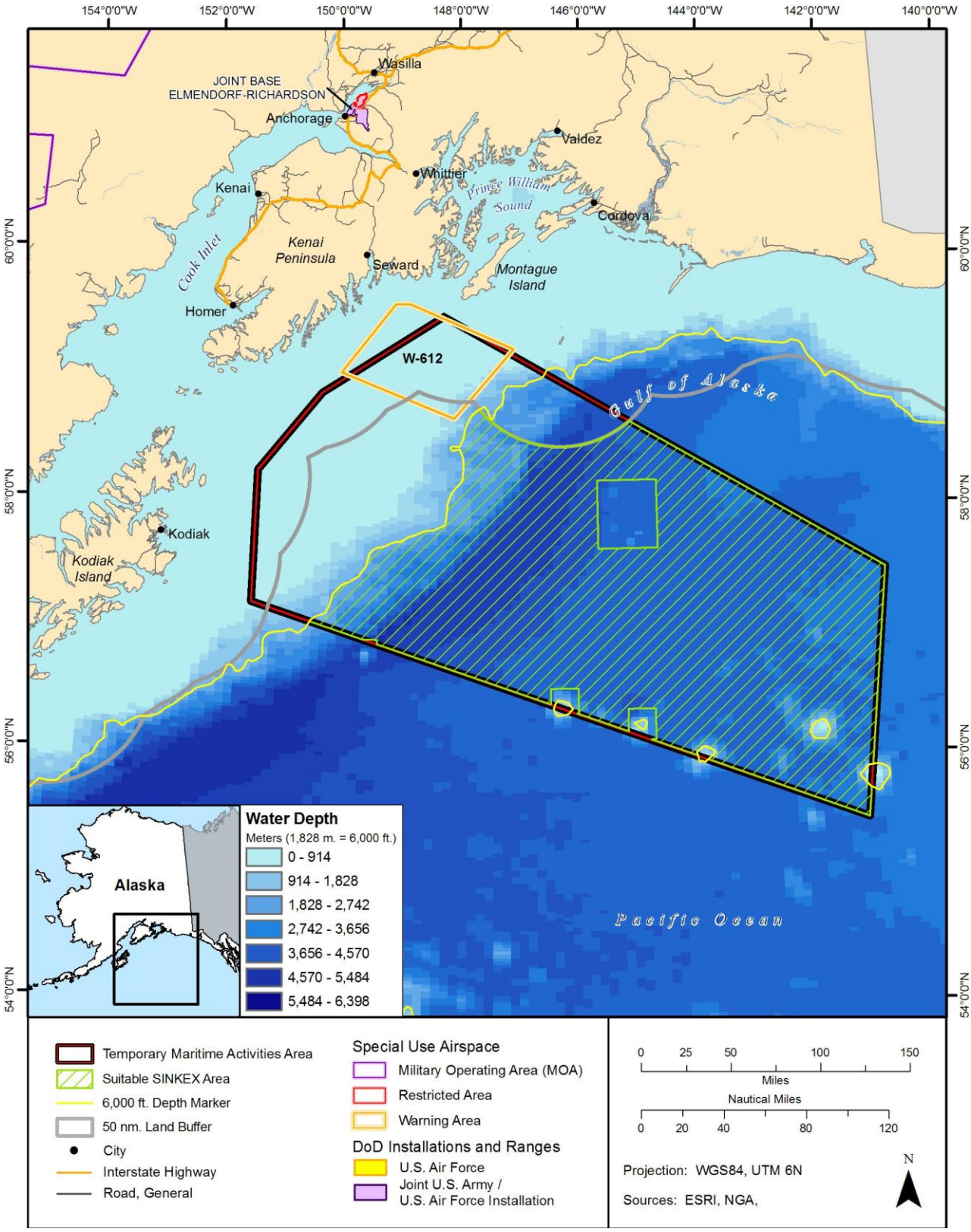


Figure 2-7: Possible Locations of a SINKEX within the TMAA

2.6.2 Revised Level of Activities

Table 2-5 identifies the baseline and proposed increases in activities in the ATA under Alternative 2. In general, most activities would increase under Alternative 2.

2.6.3 Activity Summary Tables

Tables 2-4 through 2-7 summarize the activities in the ATA. Table 2-4 lists the active sources proposed for use in the TMAA under Alternatives 1 and 2. Table 2-5 provides detailed information on each of the No Action Alternative (Baseline), Alternative 1, and Alternative 2 activities. Table 2-6 lists the annual expenditure of ordnance and other related training materials in the TMAA. Table 2-7 lists that annual expenditure of ordnance used during SINKEX activities under Alternative 2.

Table 2-4: Active Systems and Platforms Proposed for Use in the TMAA

System	Hours Modeled (Annual)		Associated Platform/Use
	Alt 1	Alt 2	
AN/SQS-53	289	578	DDG and CG hull-mounted sonar
AN/SQS-56	26	52	FFG hull-mounted sonar
AN/BQQ-10	24	48	Submarine hull-mounted sonar
AN/AQS-13 or AN/AQS-22	96	192	Helicopter dipping sonar
BQS-15	12	24	SSN navigation
PUTR Transponders	40	80	Portable Undersea Tracking Range
MK-84 Range Tracking Pingers	40	80	Ships, submarines, ASW targets
DICASS Sonobuoy (AN/SSQ-62)	133	266	MPA deployed sonobuoys
IEER Sonobuoy (AN/SSQ-110A)	20	40	MPA deployed sonobuoys
MAC Sonobuoy (AN/SSQ-125)	20	40	MPA deployed sonobuoys
SUS, MK-84	12	24	Surface Ships and Aircraft
EMATT	6	12	Surface ships and Aircraft

CG – Guided Missile Cruiser; DDG – Guided Missile Destroyer; FFG – Fast Frigate; DICASS – Directional Command-Activated Sonobuoy System; HF – High-Frequency; MF – Mid-Frequency.

Table 2-5: Current and Proposed Annual Level of Activities in the Alaska Training Areas

Range Activity	Platform	System or Ordnance	No Action Alternative	Alternative 1	Alternative 2	Location
ANTI-AIR WARFARE (AAW)						
Aircraft Combat Maneuvers	EA-6B, EA-18G, FA-18, F-16, F-15, F-22	None	300 sorties	300 sorties	600 sorties	TMAA, Air Force SUA[1]
Air Defense Exercise	FA-18, F-16, F-15, F-22, EA-6B, EA-18G, P-3C, P-8 MMA, CVN, CG, DDG, FFG	None	3 events	4 events	8 events	TMAA
S-A Missile Exercise	CVN, CG, DDG, FFG	Sea Sparrow Missile, Standard Missile 1, or RAM Target: BQM-74E	2 events	3 events	6 events	TMAA
Surface-to-Air (S-A) Gunnery Exercise	CG, DDG, FFG, AOE	5”/54 BLP, 20mm CIWS, 7.62mm Target: Towed TDU-34	2 events	3 events	6 events	TMAA
Air-to-Air (A-A)Missile Exercise	FA-18, F-16, F-15, F-22 E-2C, EA-6B, EA-18G	AIM-7, AIM-9, AIM-120 AMRAAM Targets: TALD or LUU-2B/B	2 events	3 events	6 events	TMAA, Air Force SUA[1]
ANTI-SURFACE WARFARE (ASUW)						
Visit Board Search and Seizure	MH-60S, RHIB, NSW Personnel	None	12 events	12 events	24 events	TMAA
Air-to-Surface (A-S) Missile Exercise	MH-60R/S, FA-18, F-16, F-15, F-22, EA-6B, EA-18G	CATM-114 Hellfire, CATM-84 (SLAM-ER), an CATM-84 Harpoon, or an CATM-65 Maverick (all captive carry/not released)	1 events	2 events	4 events	TMAA

Table 2-5: Current and Proposed Annual Level of Activities in the Alaska Training Areas (continued)

Range Activity	Platform	System or Ordnance	No Action Alternative	Alternative 1	Alternative 2	Location
Air-to-Surface (A-S) Bombing Exercise	FA-18, F-16, F-15, F-22	MK-82 (live),MK-83 (live), MK-84 (live) BDU-45 (inert), MK-58 marine marker	12 events	18 events	36 events	TMAA
Air-to-Surface (A-S) Gunnery Exercise	MH-60R/S	GAU-16 (0.50-cal) or M-60 (7.62mm) machine gun Targets: HSMST, Trimaran, SPAR, Surface Target Balloon	5 events	7 events	14 events	TMAA
Surface-to-Surface (S-S) Gunnery Exercise	CVN, CG, DDG, FFG, AOE	5”/54 BLP, 20mm CIWS, 25 mm, 7.62mm, 57mm, .50 cal Targets: HSMST, Trimaran, SPAR, Surface Target Balloon	5 events	6 events	12 events	TMAA
Maritime Interdiction	All	None	14 events	14 events	28 events	TMAA
Sea Surface Control	FA-18, EA-6B, EA-18G, P-3C, P-8 MMA, CG, DDG, FFG	None	6 events	6 events	12 events	TMAA
Sink Exercise	FA-18, F-16, F-15, F-22, EA-6B, EA-18G, P-3C, P-8 MMA, MH-60R/S, CVN, CG, DDG, FFG	MK-82 (Inert), MK-82 (live), MK-83, AGM-88 HARM, AGM-84 Harpoon, AGM-65 Maverick, AGM-114 Hellfire, AGM-119 Penguin, Standard Missile 1, Standard Missile 2, 5”/54 BLP	N/A	N/A	2 events	TMAA

Table 2-5: Current and Proposed Annual Level of Activities in the Alaska Training Areas (continued)

Range Activity	Platform	System or Ordnance	No Action Alternative	Alternative 1	Alternative 2	Location
ANTI-SUBMARINE WARFARE (ASW)						
Anti-Submarine Warfare (ASW) Tracking Exercise - Helicopter	MH-60R	Targets: SSN, MK-39 EMATT Sonobuoys: AN/AQS-22, SSQ-36 BT, SSQ-53 DIFAR (passive), SSQ-62 DICASS (active), SSQ-77 VLAD Other: MK-58 marine marker	N/A	22 events	44 events	TMAA
Anti-Submarine Warfare (ASW) Tracking Exercise - MPA	P-3C, P-8 MMA	Targets: SSN, MK-39 EMATT Sonobuoys: SSQ-36 BT, SSQ-53 DIFAR (passive), SSQ-62 DICASS (active), SSQ-77 VLAD Other: MK-58 marine marker	N/A	13 events	26 events	TMAA
ASW Tracking Exercise - Extended Echo Ranging (EER) (includes IEER and MAC)	P-3C, P-8 MMA	SSQ-110A EER/IEER, SSQ-125 MAC, SSQ-77 VLAD	N/A	2 events	4 events	TMAA
ASW Tracking Exercise - Surface Ship	DDG, FFG	SQS-53C, SQS-56 MFA sonar Targets: SSN, MK-39 EMATT	N/A	2 events	3 events	TMAA
ASW Tracking Exercise - Submarine	SSBN, SSGN	Targets: MK-39 EMATT	N/A	2 events	3 events	TMAA
ELECTRONIC COMBAT (EC)						
Electronic Combat (EC) Exercises	EA-6B, EA-18G, P-3, EP-3, CVN, CG, DDG, FFG	None	4	5 events	10 events	TMAA, Air Force SUA[1]

Table 2-5: Current and Proposed Annual Level of Activities in the Alaska Training Areas (continued)

Range Activity	Platform	System or Ordnance	No Action Alternative	Alternative 1	Alternative 2	Location
Chaff Exercises	EA-6B, EA-18G, P-3, EP-3, FA-18, CVN, CG, DDG, FFG, AOE	Chaff	2 events	2 events	4 events	TMAA, Air Force SUA[1]
Counter Targeting Exercises	EA-6B, EA-18G, P-3, EP-3, FA-18, CVN, CG, DDG, FFG, AOE	None	4 events	4 events	8 events	TMAA
NAVAL SPECIAL WARFARE (NSW)						
Special Warfare Operations	C-130, MH-60S, SDV, RHIB, NSW Personnel.	None	10 events	10 events	20 events	TMAA, Air Force SUA[1], Army Training Lands[1]
STRIKE WARFARE (STW)						
Air-to-Ground Bombing Exercise	FA-18, F-16, F-15, F-22, EA-6B, EA-18G	MK-82/83/84 (live/Inert), BDU-45 (inert), CATM-88C (not released)	150 sorties	150 sorties	300 sorties	Air Force SUA[1], Army Training Lands[1]
Personnel Recovery	CVN, CG, DDG, FFG, AOE, MH-60S, RHIB, NSW Personnel.	None	3 events	4 events	8 events	Air Force SUA[1], Army Training Lands[1]
SUPPORT OPERATIONS						
Deck Landing Qualifications	Helicopters (Air Force, Army, Coast Guard – various)	None	4 events	6 events	12 events	TMAA

1: Activities within and upon these areas are covered under separate NEPA analysis.

Table 2-6: Annual Ordnance and Expendables Use in the TMAA

Training Area and Ordnance/Expendable Type	Number of Rounds/Expendables per Year				
	No Action	Alternative 1	% Increase over No Action	Alternative 2	% Increase over No Action
Gulf of Alaska Temporary Military Activities Area (TMAA)					
BOMBS					
BDU-45 (Inert)	72	108	50.0%	216	200.0%
MK-82 (HE)	42	64	52.4%	128	204.8%
MK-83 (HE)	4	6	50.0%	12	200.0%
MK-84 (HE)	2	2	0.0%	4	100.0%
MISSILES					
AIM-7 Sparrow	6	9	50.0%	18	200.0%
AIM-9 Sidewinder	8	12	50.0%	24	200.0%
AIM-120 AMRAAM	6	9	50.0%	18	200.0%
Standard Missile	2	3	50.0%	6	200.0%
NAVAL GUNSHELLS					
20mm (Inert)	8,000	10,000	25.0%	20,000	150.0%
25mm (Inert)	2,500	3,000	20.0%	6,000	140.0%
57mm (Inert)	0	100	N/A	200	N/A
76mm (HE)	10	14	40.0%	28	180.0%
76mm (Inert)	6	8	33.3%	16	166.7%
5 inch (HE)	30	42	40.0%	84	180.0%
5 inch (Inert)	18	24	37.5%	48	166.7%
SMALL ARMS ROUNDS					
7.62mm Projectile	4,000	4,500	12.5%	9,000	125.0%
.50 cal machine gun	1,000	1,200	20.0%	2,400	140.0%
PYROTECHNICS					
LUU-2B/B Flare	12	18	50.0%	36	200.0%
MK-58 Marine Marker (Day/Night smoke/flare)	20	60	200.0%	120	500.0%
TARGETS					
MK-39 Expendable Mobile ASW Training Target (EMATT)	N/A	6	N/A	12	N/A
Tactical Air Launched Decoy (TALD)	8	12	50.0%	24	200.0%
TDU-34 Towed Target (Retained, not expended)	2	3	50.0%	6	200.0%
BQM-74E	2	2	0.0%	4	100.0%
SPAR (Recovered)	10	12	20.0%	24	140.0%
Killer Tomato (Recovered)	10	12	20.0%	24	140.0%

Table 2-6: Annual Ordnance and Expendables Use in the TMAA (continued)

Training Area and Ordnance/Expendable Type	Number of Rounds/Expendables per Year				
	No Action	Alternative 1	% Increase over No Action	Alternative 2	% Increase over No Action
SONOBUOYS					
SSQ-36 BT	24	60	150%	120	400%
SSQ-53 DIFAR Passive	N/A	500	N/A	1,000	N/A
SSQ-62 DICASS Active	N/A	133	N/A	267	N/A
SSQ-77 VLAD	N/A	60	N/A	120	N/A
SSQ-110A/MAC	N/A	40	N/A	80	N/A
CHAFF					
ALE-43 Dispenser (Aluminized glass roll)	540 lbs	540 lbs	0.0%	1080 lbs	100.0%
SIGNALING DEVICE					
SUS MK-84	N/A	12	N/A	24	N/A

HE – High Explosive

Table 2-7: Representative Annual Ordnance Expended During SINKEX in the TMAA

Ordnance Type	Number of Rounds per Year[2]
BOMBS[1]	
MK-82	14
MK-82 (Inert)	6
MK-83	8
MISSILES	
HARM	4
Harpoon	10
Maverick	6
Hellfire	2
Penguin Missile	2
Standard Missile 1	2
Standard Missile 2	2
TORPEDOES	
MK-48	2
NAVAL GUNSHELLS	
5 inch	800
TOTAL	**858**

1 MK-80 series bombs will be replaced with BLU series bombs
2 Total rounds are cumulative for 2 separate SINKEXs

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