M2 Comment Response Key

Comment responses for public comment on the Final Environmental Impact Statement (EIS) are included in this section. Comment responses are organized by topic/resource area in the order in which the resource topics are discussed in the Final EIS. Comment responses have been developed based on topics/concerns raised during the Draft EIS public comment review period. Similar to the comment themes discussed in Section 1.11, responses are developed based on public comment input and are provided to clarify information discussed in the EIS analysis. All comments received have been assigned an appropriate comment response code(s). The Navy received 4,335 comments on the Draft EIS. For the purposes of publishing this appendix, comments and their associated comment responses are not reproduced in full. Most public comments were at least two pages in length, with numerous comments of 10 to 20 pages or more. All public comments received are part of the administrative record for the project. For ease of review, we have included a comment response index that lists each comment using the commenter's alphanumeric code with corresponding response codes for every comment submitted. Full-length comments and their corresponding comment responses are published in their entirety and made available online at the following location:

- http://whidbeyeis.com/

The following is the comment response key. Each response is tagged with a code and short title. Response codes/titles are assigned to each comment as appropriate to respond to the commenter's questions or concerns.

1. General

1.a. Thank You

Thank you for your participation in the National Environmental Policy Act process. Your comment is part of the official project record. We have reviewed and considered all comments received and have updated the analysis where appropriate. Please use provided response codes to see how comments were addressed in the preparation of the Final Environmental Impact Statement.

1.b. Best Available Science and Data

Many comments were received regarding the Navy utilizing the best available science and data for the development of the Environmental Impact Statement (EIS) along all topic areas. Environmental conditions for each resource are evaluated using the best available science and data for that specific resource. In accordance with 40 Code of Federal Regulations 1502.22, for each resource area evaluated, the Navy researched and used the best available science and data, and clearly stated when some information is incomplete or unavailable for any resource under analysis. The EIS analysis was prepared using the best available data available at the time of preparation. While the Navy recognizes that best available data have the potential to be updated at any time, the information presented in this analysis is sufficient for decision makers to accurately assess the impacts for each alternative at this time.

The Navy assessed the potential noise effects using the best available science, data, methods, and metrics. To assess noise impacts, the Navy applied the federal standard (day-night average sound level [DNL] contours) plus included supplemental metrics and provided location-specific quantifiable data for 48 points of interest. A comprehensive noise study (Appendix A) was prepared, and specific discussions on key topics are addressed in Section 4.2 (Noise). An extensive literature review was completed for the

purposes of this analysis, including Sections 4.2 (Noise) and Appendix A1 of the Aircraft Noise Study. Although the scientific community has not come to a consensus that there is a definitive causal and significant relationship between aircraft noise and health for residents living near military or civilian airfields, a discussion of the peer-reviewed research on nonauditory health impacts is included in Section 4.2 (Noise) and in the Aircraft Noise Study (Appendix A1).

For biological resources, the most current and best available peer-reviewed species data sets and surveys were used to inform the analysis. An extensive literature review was conducted for purposes of preparing the biological resources analysis; see Sections 3.8 and 4.8 of the EIS.

1.c. Segmentation and Connected Actions

The Navy prepared this Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality regulations and Navy regulations for implementing NEPA. Under the Proposed Action, the Navy evaluated potential environmental impacts of continuing and increasing airfield operations, establishing facilities and functions at Ault Field to support an expanded Growler mission and associated personnel changes. This EIS evaluated a range of alternatives that meet the purpose of and need for the Proposed Action. The analysis includes discussion of impacts for a No Action Alternative as well as three alternatives for implementing the Proposed Action. This EIS evaluates five operational scenarios for each of the alternatives, for a total of 15 alternatives analyzed. This EIS does not analyze impacts of Growler training occurring at existing range complexes, special use airspace, and testing ranges. The Navy prepares separate NEPA documents addressing home basing and training because each of these documents is focused on a specific Proposed Action, separated from other actions by its purpose and need, independent utility, timing, and geographic location. Furthermore, NEPA documents for training occurring within a range complex or military operations area involve many different types of aircraft and ships.

While the Navy has analyzed, and is currently analyzing, various Proposed Actions in the Pacific Northwest region, those Proposed Actions are not preconditions for Growler operations at the Naval Air Station (NAS) Whidbey Island complex. Likewise, Growler operations at the NAS Whidbey Island complex are not a precondition for larger military readiness activities on range complexes in the Pacific Northwest. Even in the absence of this Proposed Action, military training in the Pacific Northwest would continue independently from this Proposed Action, as analyzed in the documents referenced in Section 1.6. The Navy does consider the cumulative impacts from other past, present, and reasonably foreseeable future actions, including training activities, in all NEPA documents. In this EIS, these actions are considered in Chapter 5 (Cumulative Impacts). A cumulative impact is the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time-frame in which the coincidental effects could be expected to occur. For this analysis, the study area is resource-specific, as identified in Chapter 4 for the respective resource areas. The time-frame for cumulative impacts centers on the timing of the Proposed Action.

1.d. General Project Concerns

The Navy values the public participation process to identify public project concerns and to ensure open and transparent dialog regarding the Proposed Action. The Navy recognizes that many residents, workers, and visitors in the communities surrounding the Naval Air Station (NAS) Whidbey Island complex are concerned about the scope and potential impacts of the Proposed Action. Therefore, the Navy implemented an accessible and thorough public participation process during preparation of the Environmental Impact Statement (EIS) to facilitate participation by all interested members of the public, to allow opportunities to have questions answered by Navy representatives, and to ensure the analysis addresses all concerns expressed by public stakeholders. Sections 1.9, 1.10, and 1.11 detail the public participation processes that were followed during scoping and release of the Draft EIS.

Following completion of the EIS, the Navy's goal will be to continue to foster open communication and mutual understanding of ongoing initiatives among interested federal, state, and local agencies as well as the public. Navy Region Northwest leadership and personnel routinely and proactively meet with and inform elected officials and their staffs, community organizations, and federal and state agencies about current and projected activities and projects. The Navy conducts and participates regularly in public outreach and community events. Through its active Air Installations Compatible Use Zones program at NAS Whidbey Island, the Navy works with neighboring communities to protect the safety, welfare, and health of those who live and work near military airfields while preserving the military flying mission. The Navy will continue to address local concerns about aircraft operations at the NAS Whidbey Island complex through implementation of this long-standing program in coordination with the community.

1.e. Risk of Terrorist Attack

Many comments were received that suggested there would be an increased risk of a terrorist attack due to the implementation of the Proposed Action. Section 1.11 of the Environmental Impact Statement (EIS) provides details on this topic. The Proposed Action does not change the status of Naval Air Station (NAS) Whidbey Island as the home of the Navy's tactical Electronic Attack community, and it does not change the Navy's force protection requirements that make a terrorist attack on a guarded military facility difficult and unlikely. Thus, this action does not change the extent to which NAS Whidbey Island is currently a target for terrorism.

The Navy, independently and in cooperation with federal, state, and local agencies, routinely conducts training and emergency preparedness exercises to assess plans and responses to theoretical scenarios in order to assess the Navy's ability to respond to physical security challenges (active shooters, higher physical security postures, terrorism, and cyber security), natural disasters (severe weather, tsunamis, and earthquakes), and other incidents (spill response, fires, and medical emergencies). The purpose of emergency preparedness training, drills, desk-top exercises, and full-scale simulations is to improve responsiveness; to test plans, policies, procedures, and communication during a response; to identify areas of improvement; and to implement appropriate measures to continue managing post-response actions while ensuring business continuity.

2. Purpose and Need, the National Environmental Policy Act Process, Public Participation, Proposed Action, and Alternatives

2.a. Purpose and Need

The U. S. Department of Defense has identified a need for additional Growler aircraft to enhance the U.S.'s electronic attack capability. The Naval Air Station (NAS) Whidbey Island complex is the home base for the tactical Electronic Attack community in the United States. The additional Growler aircraft would be located at the NAS Whidbey Island complex because Ault Field is the home base location of the Navy's entire tactical Electronic Attack community in the U.S., including all Growler squadrons.

For more information on the purpose and need for the Proposed Action, see Section 1.3 and for more information on the Proposed Action and alternatives, see Chapter 2.

2.b. Scope of the Environmental Impact Statement and Analysis Conducted

The Environmental Impact Statement (EIS) describes the purpose of and need for the Proposed Action as well as a description of the alternatives analyzed. The EIS evaluates the potential environmental impacts from the Proposed Action associated with the following resource areas: airspace and airfield operations, noise, public health and safety, air quality, land use, cultural resources, American Indian traditional resources, biological resources, water resources, socioeconomics, environmental justice, transportation, infrastructure, geological resources, hazardous materials and wastes, climate change and greenhouse gases, and the cumulative impacts of the Proposed Action and other regional projects (see Section 1.5 of the EIS).

The EIS includes an analysis of the Proposed Action and the potential impacts of the alternatives, including the No Action Alternative, and considers and responds to the comments and concerns identified through the public participation process as described in Sections 1.9, 1.10, and 1.11. In general, environmental analysis involving aircraft operations at military airfields requires an analysis of noise, air quality, biological resources, and land use compatibility. New facility construction generally requires analysis of potential impacts to topography and soils, water resources and wetlands, biological resources, and cultural resources. Changes in personnel levels generally require analysis of socioeconomics, community services, safety, infrastructure and utilities, and transportation. The Final EIS provides clarifications and identifies changes that were made to the Draft EIS (see Section 1.13). Chapter 3, Affected Environment, provides a description of the existing environmental resource areas and existing conditions that could be affected from implementing any of the alternatives. For the affected environment analysis, environmental conditions for each resource are evaluated using the best available science and data for that specific resource. Chapter 4, Environmental Consequences, presents an analysis of the potential direct and indirect effects of each alternative on the affected environment. Chapter 5 discusses cumulative impacts.

2.c. Compliance with the National Environmental Policy Act

The Navy prepared this document in accordance with the National Environmental Policy Act of 1969 (NEPA); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); and Chief of Naval Operations Instruction 5090.1C, Environmental and Natural Resource Program Manual.

The Navy openly and transparently followed all NEPA requirements, CEQ regulations, and Navy policy during development of the analysis. The Proposed Action considers how additional Growler aircraft appropriated by Congress, and their aircrews, should be incorporated into the existing Growler community at the NAS Whidbey Island complex. Previous documents considering separate actions related to the tactical Electronic Attack community at NAS Whidbey Island, aircraft loading at the air station, and training at regional ranges and in special use airspace are discussed in Section 1.6. Additionally, the cumulative impacts of these separate actions in conjunction with the Proposed Action are assessed in Chapter 5.

The analysis of impacts (Chapter 4) in the current Environmental Impact Statement (EIS) considers only the impacts of the Proposed Action in order to isolate the potential impacts from impacts caused by other, separate actions. This is done, in accordance with NEPA, to enable decision makers to assess the impacts that may directly or indirectly result from the Proposed Action and its alternatives, separate from other independent actions that may overlap the Proposed Action in time or geographically.

Affected Environment, Chapter 3, contains the most current and best available science and data. Analysis in Chapter 3 has been updated, where appropriate, based on new information provided by members of the public and state and federal agencies during public review of the Draft EIS. The analysis of potential direct and indirect environmental impacts in Chapter 4, Environmental Consequences, is based upon commonly accepted and standard methodologies, to the extent that these have been developed for the resource areas analyzed in the EIS. The scope of the impacts analysis has been developed in compliance with NEPA to include concerns and resources identified by the Navy and agencies, organizations, and members of the public who participated in scoping and the draft analysis review. NEPA does not require an agency to assess every impact of its Proposed Action but instead only the impact on the physical environment.

The EIS has been revised to include additional concerns and analysis identified by commenters during the Draft EIS public comment period as appropriate. Some commenters suggested the EIS should not exceed the page limits recommended in 40 Code of Federal Regulations (CFR) 1502.7. It should be noted that these page limits are a suggestion. Given the interest in the Proposed Action shown by residents and visitors in communities surrounding the NAS Whidbey Island complex and state and federal agencies, the Navy completed detailed analyses for each resource assessed in the analysis. The Navy has worked to balance the need for detailed analysis of complex scientific matters with the need to release a document that is readily understandable by the public. The Final EIS has been reviewed for accuracy and clarity, and, wherever possible, redundant or unnecessary text has been removed.

2.d. Program of Record for Buying Growler Aircraft

The Navy currently home bases 82 operational EA-18G Growlers at the Naval Air Station (NAS) Whidbey Island complex. The Proposed Action would add 35 or 36 aircraft, to bring the total to 117 or 118 operational Growlers at the air station (see Table 2.3-1 in the Environmental Impact Statement [EIS]).

The Navy's Proposed Action remains as communicated to the public, which is potentially to operate up to 117 or 118 Growler aircraft at NAS Whidbey Island. It is important to make a distinction between the total number of aircraft that may be procured by the Navy and the number of aircraft that will be operated at NAS Whidbey Island. The current program of record, or the total number of Growlers the Navy plans to buy over the expected life of the Growler program, is 160 aircraft. This does not mean that all 160 aircraft will be operating or based at NAS Whidbey Island at one time. The program of record

represents a pool of available assets; some aircraft will be in an operational flight status, while others will be inoperable (non-flying or in preservation status) until such time as they are needed.

The Navy purchased additional replacement aircraft while the manufacturing line is still operational. Many of these additional aircraft will be maintained in a preservation status and will be used to replace aircraft at the end of their service life, aircraft that are undergoing repairs, or aircraft that may be lost in combat. Some of the preservation aircraft may be stored at NAS Whidbey Island, while other preservation aircraft may be stored at other locations. One carrier squadron is forward-deployed to Japan as part of Carrier Air Wing FIVE. Some of the aircraft will be designated as test aircraft, which will be assigned to NAS Patuxent River, in Maryland, and Naval Air Weapons Station China Lake, California. Some aircraft will be assigned to NAS Fallon, in Nevada, as part of the Naval Aviation Warfighting Development Center.

The total number of Growler aircraft purchased does not change the Navy's Proposed Action. As announced to the public, the Navy has proposed to increase the number of operational Growler aircraft from the current 82 to a total of 117 or 118 operational Growler aircraft. As discussed in the EIS, the aircraft will be assigned to carrier squadrons, expeditionary squadrons, and the training squadron home based at NAS Whidbey Island.

It is important to note that the number of operations is not defined by the total number of aircraft but by the number of aircrews assigned to them. The aircraft only facilitate the training for Navy aircrews. Thus, the total number of Growler aircraft procured by the Navy does not define how many of these aircraft will be operational. The number of operations is defined by how many aircrews are available to fly the aircraft.

2.e. Public Involvement Process

The Navy met and, in most cases, exceeded the public engagement responsibilities required by law, regulation, and practice. The Navy openly and transparently followed all National Environmental Policy Act (NEPA) requirements, Council on Environmental Quality regulations, and Navy policy during the development of this Final Environmental Impact Statement (EIS). For more information on the public involvement process, see Sections 1.9, 1.10, and 1.11 of the EIS. The Navy's goal is to foster open communication and mutual understanding of ongoing initiatives among interested federal, state, and local agencies; tribes; and the general public. Navy Region Northwest leadership and local Navy personnel routinely and proactively meet with elected officials and their staff, community organizations, and federal and state agencies to keep them informed about current and future activities. The Navy conducts and participates regularly in public outreach and community events. Through its active Air Installations Compatible Use Zones program at the Naval Air Station (NAS) Whidbey Island complex, the Navy works with neighboring communities to protect the safety, welfare, and health of those who live and work near military airfields while preserving the military flying mission. The Navy will continue to address local concerns about aircraft operations at the NAS Whidbey Island complex through implementation of this long-standing program in coordination with the community.

There were a number of opportunities for the public to participate in the NEPA process. Please refer to Sections 1.9, 1.10, and 1.11 for a more detailed discussion of the public and agency outreach process.

2.f. Use of Public Comments

Public comments received during scoping and review of the Draft Environmental Impact Statement (EIS) are an important part of the National Environmental Policy Act (NEPA) process. The purpose of the public comment process is to provide members of the public an opportunity to submit their comments and concerns regarding the Proposed Action, alternatives, and the analysis of potential environmental impacts. The Navy reviewed all comments submitted during both scoping periods (September 2013 to January 2014, and October 2014 to January 2015) and during review of the Draft EIS (November 2016 to February 2017). All comments received are included as part of the administrative record for the project. Many commenters noted they submitted comments during the scoping process of the EIS but never received a formal response. Although the Navy is not required under NEPA to respond to scoping comments, the Navy did consider all scoping comments in preparing the Draft EIS and used them to shape the breadth and depth of the analysis in the Draft EIS. Section 1.9.4 summarizes the public scoping comments received during the 2013-2014 scoping efforts and the 2014-2015 scoping efforts. Comments received on the Draft EIS from public stakeholders--citizens, elected leaders, American Indian tribes and nations, regulatory agencies, and other interested parties--were used to revise and refine the analysis in the Final EIS. In response to public comment, the Navy carefully analyzed public suggestions for other basing and training solutions to the Proposed Action (Section 2.4), reviewed noise reports and other documents prepared by independent sources (Section 1.12), and expanded the noise analysis to include additional supplemental metrics in preparation of the Final EIS (Sections 3.2 and 4.2). The Navy documented public stakeholder engagement and how public comments were used to change and refine the analysis, as described in Sections 1.9, 1.10, and 1.11. While commenters did not receive a personal or individualized response, the Navy has summarized and addressed all public comments submitted during the Draft EIS review period. Comments and coded responses are provided in this appendix. Personally identifiable information has been kept confidential and will not be released unless otherwise specifically indicated by the commenter or as required by law. The city, state, and five-digit zip code of individuals who provided comments may be released.

Comments could be submitted during public comment periods in four ways:

- as written comments provided at a public meeting
- as verbal comments provided to the stenographer at a public meeting
- as written comments submitted electronically to the project website (www.whidbeyeis.com)
- as written comments mailed to the Navy at 6506 Hampton Boulevard, Norfolk, VA 23508 (Attn: Code EV21/SS)

In addition to public review, the Draft EIS was reviewed by the U.S. Environmental Protection Agency, National Marine Fisheries Service, U.S. Fish and Wildlife, Washington State Department of Ecology, Washington State Department of Health, Washington's State Historic Preservation Office, and numerous other interested parties. The comments were used to inform the final analysis and ensure the Navy has a complete analysis addressing topics important to the public.

2.g. Agency Participation

The Navy proactively engaged appropriate federal and state agencies during the development of the Environmental Impact Statement (EIS). The Navy was able to leverage the expertise of these agencies and worked to address their questions. The Navy did not identify a need for a formal cooperating agency

agreement regarding the Proposed Action. The Navy, through the National Environmental Policy Act (NEPA) process, distributed the EIS to 105 federal, state, and local agencies and American Indian tribes and nations for review and comment, including 31 federal agency contacts, five federal elected officials, eight federally recognized tribes, 19 state agency contacts, 16 state elected officials, two local agency contacts, and 24 local elected officials (see Chapter 9, Distribution List; Appendix C, Federal and State Correspondence; and Appendix M, Public Comments and Response Key). While the distribution list numbers have changed over time, the Navy continues to reach out to interested parties.

In July 2015, the Navy and National Park Service (NPS) met to discuss topics of mutual concern in the Pacific Northwest, including ongoing and proposed Navy actions affecting national parks (including this Proposed Action). The goal of this meeting was to enhance dialog, support a long-term working relationship, and understand each organizational mission. The meeting was hosted by the NAS Whidbey Island Commanding Officer, with participation from the Navy and NPS staff at the headquarters, regional, and local level. Since then, the Navy has maintained an ongoing dialog with the NPS at all organizational levels. For example, the Office of Assistant Secretary of Navy (Energy, Installations and Environment) has remained in close communication with NPS Natural Sounds and Night Skies Division. These offices, as well as the Federal Aviation Administration, Federal Interagency Committee on Aviation Noise, and Defense Noise Working Group, have collaborated on numerous policy matters of mutual concern. In addition, the Department of Interior on behalf of the NPS submitted comments on the Draft EIS.

Following publication of the Draft EIS, the Navy proactively reached out to the U.S. Environmental Protection Agency (USEPA) Region 10 and Washington State Department of Health (WADOH) to facilitate dialog and understanding of the draft analysis and findings. As a result, the Navy hosted meetings on December 5 and 6, 2016, respectively, with each organization. During each 2-hour session, the Navy provided an overview of the analysis, and Navy subject matter experts answered agency questions. The Navy received comments on the Draft EIS from USEPA Region 10 and WADOH and considered those comments as it developed the Final EIS. Since then, the Navy has maintained an ongoing dialog with the USEPA at all levels and with WADOH to discuss concerns. Per discussions with USEPA Region 10 and WADOH, a new appendix on Community Health and Learning (Appendix I) has been added to this EIS. In follow-on discussions with USEPA staff, it was agreed that the EIS already contained a substantial analysis regarding both auditory and nonauditory impacts from aircraft noise, and that placing this information in one comprehensive appendix would help present this information to the public (see Appendix I of this EIS). The EIS also includes a Noise and Health Reader's Guide, which is intended to assist readers in locating information within the EIS related to potential health effects of noise. The guide is located in the Executive Summary, just prior to the Table of Contents.

The Proposed Action is subject to regulatory review by the U.S. Fish and Wildlife Service and National Marine Fisheries Service. Details on the Navy's consultations with these agencies are included in Appendix C. The Navy initiated government-to-government consultations with eight federally recognized American Indian tribes and nations. If at any time these federally recognized American Indian tribes and nations would like to discuss the Proposed Action, the Navy will initiate further discussions. Government-to-government consultation on this Proposed Action was requested by the Swinomish Indian Tribal Community on December 13, 2016; however, the tribe subsequently withdrew its request on September 27, 2017. No other American Indian tribes and nations have requested or initiated government-to-government consultation at this point in the environmental planning process. In addition, the Navy consulted with the Washington State Department of Ecology regarding coastal

resources. As part of this process the Navy considered public comments received by the Washington State Department of Ecology when the department released the Navy's findings for public comment (see Appendix C). In addition, the Navy is pursuing consultations with the Washington State Historic Preservation Office regarding coastal resources and historic properties (see Appendix C). There are 22 consulting parties engaging with the Navy as part of the Section 106 process.

In summary, the Navy has proactively engaged federal and state agencies at all organizational levels throughout the NEPA process.

2.h. Next Steps

Comments on the Draft Environmental Impact Statement (EIS) were used to inform the Final EIS and ensure the Navy has a complete analysis that addresses topics important to the public. In this Final EIS, the Navy has reviewed and responded to all comments (see Appendix M). Regulators and consulting agencies have reviewed the analysis and provided comments and recommendations to the Navy as part of the agency review process. The Navy has engaged in and completed all appropriate consultations as required by law. The Council on Environmental Quality regulations provide for a 30-day waiting and public review period after notice of availability is published that the Final EIS has been filed with the U.S. Environmental Protection Agency and before the Navy may take final action. The final decision is made by the Secretary of the Navy, and it will be published as a Record of Decision (ROD). The announcement that the ROD is available, and locations where the ROD will be made available, will be published in the *Federal Register*. In the ROD, the Navy will explain its decision, describe the alternatives it considered, and discuss its plans for mitigation and monitoring. Concurrent with the publication in the *Federal Register*, the Navy will notify elected leaders, issue a press release, mail letters and postcards to public stakeholders, update the project website and use social media, and publicize the decision with paid newspaper advertisements.

2.i. Proposed Action

The Proposed Action is to continue and expand existing Growler operations and increase electronic attack capabilities by adding 35 or 36 aircraft to squadrons at NAS Whidbey Island in response to the purchase of additional Growler aircraft by Congress between 2013 and 2016 (see Section 2.1). The U. S. Department of Defense identified the need for additional Growler aircraft to meet mission requirements for tactical airborne electronic attack capabilities. In order to incorporate additional Growler aircraft that have been appropriated, and their aircrews, into the existing Growler community, the Navy is required to complete an environmental analysis under the National Environmental Policy Act to study potential impacts of the action on the human and natural environment. The Proposed Action was initiated by the identification of the need for and subsequent purchase of additional Growler aircraft. See Section 2.2 for more information on the development of a range of alternatives that meet the purpose and need of the Proposed Action. The environmental analysis considers how these aircraft should be incorporated into the Growler community. See Section 2.3 for detailed discussion of alternatives carried forward for further analysis. This analysis does not evaluate in full those actions that do not meet the purpose of and need for the Proposed Action. See Section 2.4 for a discussion of alternatives considered but not carried forward for further analysis.

2.j. Costs of the Proposed Action

The purpose the National Environmental Policy Act is to assess the environmental impacts of a proposed federal action. The Proposed Action evaluated in this analysis is described in Section 1.1. A meaningful comparison of the alternatives under consideration must entail a comparison of multiple factors and, as such, does not lend itself to a monetary cost-benefit analysis, which is not required (40 CFR 1502.23). See Section 1.11.6 of this EIS for more details on cost-benefit analysis.

Funding for the acquisition of the aircraft has been appropriated in accordance with the U.S. Department of Defense (DoD) Appropriations Act of 2014 and as authorized subsequently by Congress (see Section 2.1 of the EIS). All DoD budget requests seek to balance needs to modernize the joint force, increase readiness, increase capacity and lethality, reform how DoD does business, keep faith with service members and their families, and support overseas contingency operations.

2.k. Range of Alternatives

The Navy's Proposed Action is described in detail in Sections 1.1 through 1.3 and Section 2.1 of this Environmental Impact Statement (EIS). Reasonable alternatives considered are those that would meet the purpose of and need for the Proposed Action and are practical or feasible from a technical and fiscal appropriation standpoint (i.e., three force-structure alternatives and five scenarios that distribute variable percentages of flight operations between Ault Field and Outlying Landing Field [OLF] Coupeville). Implementing the Proposed Action would require additional operations to meet training requirements and ensure the readiness of the additional Growler aircrews. Alternatives that would reduce the operational effectiveness of the Airborne Electronic Attack community would not meet the purpose and need for the Proposed Action and therefore were not carried forward for further analysis. See Section 2.4 for details on the alternatives considered but not carried forward for further analysis

Previous aircraft transitions of NAS Whidbey Island's carrier and expeditionary Electronic Attack squadrons from the Prowler aircraft to the Growler aircraft are covered in Environmental Assessments completed in 2005 and 2012. These aircraft transitions have been completed, and operations needed to meet the training requirements for these squadrons would continue under the No Action Alternative and each of the alternatives considered in the EIS. Alternatives that would decrease Growler squadrons or the number of training operations required to maintain aircrew proficiency below current levels do not meet the purpose of and need for the Proposed Action. See Section 2.4 for more details.

2.l. No Action Alternative

As stated in Section 2.3.1, the No Action Alternative would not meet the purpose of or need for the Proposed Action; however the conditions associated with the No Action Alternative serve as reference points for describing and quantifying the potential impacts associated with the alternatives. The No Action Alternative considers the potential impacts of not implementing the Proposed Action, meaning in this case that the Navy would not operate additional Growler aircraft and would not add additional personnel at Ault Field, and no construction associated with the Proposed Action would occur. Previously authorized operational changes (such as the replacement of older P-3C Orion aircraft with new P-8A Poseidon aircraft) are ongoing at Naval Air Station (NAS) Whidbey Island; therefore, the analysis evaluates 2021 as the representative year for the No Action Alternative because it represents conditions when these changes are expected to be fully implemented and complete. Using 2021 as the

representative year for the No Action Alternative allows the Navy to isolate the impacts of this Proposed Action and consider these impacts separately in the context of a busy and evolving installation.

Previous aircraft transitions of NAS Whidbey Island's carrier and expeditionary Electronic Attack squadrons from the Prowler aircraft to the Growler aircraft that were covered in Environmental Assessments completed in 2005 and 2012 are included in the No Action Alternative. These aircraft transitions are complete, and operations needed to meet the training requirements for these squadrons would continue under the No Action Alternative and each action alternative.

Affected environment conditions assessed in Chapter 3 differ depending on the resource and the best available science and data. For most resources, the best available current science and data were used to inform the analysis of affected environment conditions. However, for noise and related resources such as airfield operations, and because of the complex operational environment at NAS Whidbey Island, the year 2021 is used to describe the affected environment because 2021 represents conditions when previous aircraft loading decisions unrelated to the Proposed Action are expected to be fully implemented and complete, thereby allowing the Navy to assess the impacts of the Proposed Action separately from unrelated actions that are planned or in progress.

2.m. Record of Decision/Preferred Alternative

At the time of publication of the public Draft Environmental Impact Statement (EIS) on November 10, 2016, no decisions had been made with respect to which alterative will ultimately be selected as a Preferred Alternative, or as to the distribution of field carrier landing practice (FCLP) operations between Ault Field and Outlying Landing Field Coupeville. Section 1502.14(e) presumes the existence of a Preferred Alternative and requires its identification. Throughout the NEPA process, the Navy sought to provide timely information for public transparency. Because the Draft EIS did not include a Preferred Alternative, the Navy took steps to announce the Preferred Alternative as soon as it was determined. On June 25, 2018, the Navy identified Alternative 2, Scenario A, as the Preferred Alternative ahead of the publication of the Final EIS. Alternative 2, Scenario A, provides the best training for Navy pilots and impacts the fewest number of residents living in the community. See Section 2.4 for more detail on the Preferred Alternative.

The next step in the NEPA process is a Record of Decision (ROD), which will occur no sooner than 30 days following the publication of the Final EIS. While NEPA and Council on Environmental Quality regulations required public comment on the Draft EIS, the regulations do not require a public comment period following the release of the Final EIS. The Navy considered all 4,335 public comments received on the Draft EIS and refined the Final EIS with updated information that improves the accuracy and thoroughness of the Final EIS analysis. Although the conclusions of the Draft EIS and Final EIS remain the same, the operational changes announced in September 2017 (i.e., the reduction in the number of pilots as defined by the latest information on the enhanced Electronic Attack mission and the implementation of Precision Landing Mode [PLM], also known as MAGIC CARPET) had an overall benefit of lessening the impacts across all alternatives and scenarios. The Final EIS provides clarifications and identifies changes that were made to the Draft EIS (see Section 1.13). The Navy response to public comment themes is provided in section M2 of this appendix.

After a 30-day waiting and public review period following the publication of the Final EIS, the Secretary of the Navy will announce a ROD, selecting the alternative/scenario combination from the range of 15 such combinations analyzed in this document.

No final decision has yet been made. The ultimate decision with respect to force structure and FCLP distribution will be made by the Secretary of the Navy or his representative, and announced in a ROD no earlier than 30 days following the public release of the Final EIS. The Navy has taken all public and agency comments received into consideration in selecting the Preferred Alternative (Alternative 2, Scenario A) that will be put forward in the Final EIS and ROD. Please see Section 2.4 for more information on the Preferred Alternative.

2.n. Alternatives Considered but Eliminated

Section 1.4 describes the Navy's use of Outlying Landing Field (OLF) Coupeville for field carrier landing practice and important operational considerations that make OLF Coupeville an ideal location for this essential training. Section 2.2 discusses the criteria used in developing the range of alternatives, including requirements for field carrier landing practice airfields.

Section 2.4 provides a discussion of alternatives considered but not carried forward for further analysis. The Navy addressed options suggested by public commenters to reduce noise by relocating aircraft or training (see Section 2.4). The Navy discussed existing noise mitigation measures in Section 3.2.4.2 and Appendix H (i.e., compatible land-use planning, ongoing noise abatement procedures, and implementation of a noise-complaint hotline phone number) and new technologies for noise-abatement (i.e., chevrons, Precision Landing Mode, and a hush house) in Section 4.2.6. Section 2.4 also includes analysis of moving some or all of the Growler community to another location and conducting field carrier landing practice elsewhere. The discussion in Section 2.4 has been expanded to further clarify the alternatives discussed therein and include additional alternatives brought forward during the public review and comment period. This discussion details why each option was not ultimately carried forward for analysis.

3. Airspace and Airfield Operations

3.a. Aircraft Operations

The Environmental Impact Statement (EIS) assesses the potential environmental effects of continuing and expanding Growler operations at the Naval Air Station (NAS) Whidbey Island complex and analyzes aircraft operations conducted in the vicinity of Ault Field and Outlying Landing Field (OLF) Coupeville. Aircraft operations increase across all alternatives, under any scenario, and the Proposed Action represents an increase in the number of operations at Ault Field and OLF Coupeville. The proposed increase in operations is discussed in Sections 2.3.3.2 and 4.1, which describe the approximate increase in the number of Growler operations. These operational levels would be similar to historical flight operations experienced in the 1970s, 1980s, and 1990s for the NAS Whidbey Island complex. Ault Field and OLF Coupeville meet all the operational requirements and have sufficient capacity under routine operating conditions to support the airfield operations of the additional Growler aircraft proposed under each alternative and scenario.

As described in Section 2.3.2, operational numbers are not determined by the number of aircraft but rather by the number of aircrews flying out of the NAS Whidbey Island complex and their training

requirements for skill maintenance and certification prior to deployment. Although the number of aircraft appear similar in the alternatives, the force structure arrangement is significant in that this determines the manner in which aircrews train using these additional aircraft, which has differing impacts on the environment (i.e., the squadron type determines field carrier landing practice [FCLP] requirement and the number of personnel stationed in the local area). An alternative that has an increased number of carrier aircraft would result in increased FCLP requirements, which would create increased noise impacts to the community because of the intense and focused nature of FCLPs when they occur. This is equally true for alternatives that increase the number of training aircraft, which also increases the demand for FCLP. In contrast, alternatives that would increase expeditionary squadrons and not carrier squadrons would have a correspondingly lower noise impact on the environment because expeditionary aircraft do not normally require FCLP. For details on the split of operations between alternatives and the two airfields, see Section 2.3.2.

3.b. Flight Tracks and Federal Aviation Administration Regulations

The analysis in the Environmental Impact Statement (EIS) primarily addresses Growler operations and flight paths. As stated in Section 3.1.2, Growler aircraft arrival and departure flight tracks associated with Ault Field are depicted in Figure 3.1-3. Additionally, Section 3.2.4.2.1 states that arrival and departure corridors into and out of Naval Air Station (NAS) Whidbey Island have been developed in conjunction with the Federal Aviation Administration (FAA) over decades, with an emphasis on flying over water and avoiding more densely populated areas. These corridors are designed to deconflict military, commercial, and general aviation routes.

The Navy must follow governing FAA rules and regulations when flying. As stated in Section 3.3.1.1, military aircraft fly in accordance with FAA Regulations, Part 91, General Operating and Flight Rules, which govern such flight components as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. These rules include the use of tactical training and maintenance test-flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations. It is the policy of NAS Whidbey Island to investigate complaints to determine compliance with FAA regulations and NAS Whidbey Island standard operating procedures. These investigations ensure that both Navy and public interests are protected and provide ongoing communication between NAS Whidbey Island and the local communities. Persons with complaints or comments may call a recorded complaint hotline at (360) 257-6665 or email comments.NASWI@navy.mil. Additional information regarding the hotline, as well as existing noise mitigation, can be found in Section 3.2 and Appendix H.

From a noise perspective, aircraft are modeled based on where their predominant flight tracks and patterns are located and using typical flight profiles and engine settings associated with a given operation. However, the flight tracks on which the aircraft travels are not as precise as a fixed, single lane of road traffic. Instead, flight tracks represent a corridor through which aircraft travel and allow for variation due to certain factors (e.g., weather conditions and traffic avoidance) that can cause an aircraft to vary slightly from those predominant flight tracks on any given operation. Flight tracks depict an orderly method of transiting aircraft from one location to another in an expeditious manner; they do not restrict aircraft to flying only on or near the flight tracks in a particular area.

3.c. Military Training Routes

Six military training routes are within 250 nautical miles of Naval Air Station (NAS) Whidbey Island. Two of these military training routes start approximately 5 miles east of Deception Pass and head both west and south. Military training routes have a centerline and defined horizontal limits on either side of this centerline and vertical limits expressed as minimum and maximum altitudes along the flight track.

Table 3.1-1 provides the number of military training routes that are part of all operations at the NAS Whidbey Island complex. Table 3.1-3 lists the number of Growler operations. A flight, also called a sortie, will account for multiple operations. The footnotes at the bottom of Table 3.1-3 explain and provide additional information about a representative sample of these operations.

Airspace usage and capacity were analyzed by evaluating flight-track congestion in the NAS Whidbey Island complex. Evaluation involved counting the number of aircraft using a specific flight track at the time the next arriving aircraft requested to use that flight track. Projected military training route (MTR) operations would increase under all alternatives for the MTRs utilized by the Growler, as shown in Table 4.1-1, and the MTRs would have sufficient capacity for the increased operations.

3.d. Arrivals and Departures

As stated in Section 3.1.2, Growler aircraft arrival and departure flight tracks associated with Ault Field and Outlying Landing Field (OLF) Coupeville are depicted in Figure 3.1-3. Additionally, Section 3.2.4.2.1 states that arrival and departure corridors into and out of the Naval Air Station (NAS) Whidbey Island complex have been developed in conjunction with the Federal Aviation Administration over decades, with an emphasis on flying over water and avoiding more densely populated areas. These flight corridors are designed to deconflict military, commercial, and general aviation routes. Noise-sensitive areas shall be avoided when at altitudes of less than 3,000 feet above ground level, except when in compliance with traffic or approach patterns per Naval Air Training and Operating Procedures Standardization general flight and operating instructions. Arrival and departure corridors and flight patterns may be over noise-sensitive areas. Aircrews shall, to the maximum extent possible, employ prudent airmanship techniques to reduce aircraft noise impacts and to avoid noise-sensitive areas whenever possible.

3.e. Field Carrier Landing Practice Patterns

The proposed Outlying Landing Field (OLF) Coupeville field carrier landing practice (day and night) patterns are depicted on Figure 4.1-1. Under all alternatives, these patterns will be used in order to improve the standardization of training and enable more use of Runway 14. The standard field carrier landing practice will result in runway use percentages based on the prevailing winds rather than aircraft performance and quality of training. Based on meteorological conditions at OLF Coupeville, the projected runway utilization for Runway 14 is approximately 30 percent, and the remaining percentage is to be utilized on Runway 32. The non-standard field carrier landing practice pattern will no longer be used with implementation of the alternatives. See Section 3.1.2 for a description of the reasons for the pattern change. Due to this standardization, the noise in certain areas may decrease slightly.

3.f. Field Carrier Landing Practice Operation Totals

The primary mission of Outlying Landing Field (OLF) Coupeville is to support Growler field carrier landing practices (FCLPs). Per Table 3.1-3, under the No Action Alternative, approximately 11,300 operations associated with FCLP operations are occurring at Ault Field, and approximately 6,100 operations

associated with FCLP are occurring at OLF Coupeville. Additionally, although a small number by comparison, other aircraft utilize OLF Coupeville for training. MH-60 helicopter operations total fewer than 400 operations annually and would be scheduled on a not-to-interfere basis with Growler operations.

3.g. Field Carrier Landing Practice Evolutions and High Tempo

The primary mission of Outlying Landing Field (OLF) Coupeville is to support Growler field carrier landing practices (FCLPs). As stated in Section 4.1.2.1, in order to provide a more transparent analysis for the public, high-tempo year field carrier landing practice (FCLP) data are provided in Appendix A. The high-tempo year data represent years when the number of events increases due to operational needs. High-tempo operations would occur if the Navy is required to surge multiple aircraft carriers and aircraft squadrons to support a global event. During a high-tempo FCLP year, total airfield operations at Ault Field would increase approximately 1 to 4 percent across all operational scenarios. During a high-tempo FCLP year, total airfield operations could increase approximately 10 to 11 percent at OLF Coupeville based on the operational scenarios selected as compared to the corresponding alternative. High-tempo FCLP years are often followed by a reduction in operations while multiple squadrons are deployed in response to a global event.

Section 3.1.2 of this Environmental Impact Statement explains how typical FCLPs are conducted.

OLF Coupeville has been continuously used for FCLP since the late 1960s, and its pattern best replicates the carrier landing pattern, thereby building and reinforcing the correct habit patterns and muscle memory for aviators. OLF Coupeville sits atop a 200-foot ridge surrounded by flat terrain, an isolated setting similar to that of an aircraft carrier operating on the open sea. The low level of man-made lighting around OLF Coupeville and the ability to completely darken the field also provide a setting that closely resembles at-sea conditions from the pilots' perspective.

3.h. Runway Usage, Flight Tracks, and Altitudes

The Navy has an active Air Installations Compatible Use Zones program in place at the Naval Air Station (NAS) Whidbey Island complex; the program's goals are to protect the safety, welfare, and health of those who live and work near military airfields while preserving the military flying mission. The Navy will continue to address local concerns about aircraft noise, runway usage, flight altitudes, and local flight patterns through implementation of this long-standing program in coordination with the community. When possible and if weather conditions allow, station officials modify flight operations to minimize noise impacts at specific times, such as during weekends and during school exams. NAS Whidbey Island continuously reviews flight procedures to determine whether there are any changes that could help reduce noise levels on the surrounding population. Additionally, NAS Whidbey Island frequently corresponds with numerous media outlets and utilizes its webpage and social media, such as NAS Whidbey Island's Facebook page, to share flight schedules and other information and to solicit public feedback. NAS Whidbey Island will continue to publish field carrier landing practice schedules and issue notifications for additional activities at the installation, such as weekend festivals. See Appendix H, Noise Mitigation, for a complete discussion of current and potential noise-abatement efforts and programs.

3.i. Runway Operating Hours and Flight Schedules

Sections 3.1.1 and 3.1.2 state Ault Field is available for use 7 days per week, 24 hours per day. Outlying Landing Field (OLF) Coupeville consists of one runway, Runway 14/32. Although OLF Coupeville is available for use 7 days per week, 24 hours per day, operations at the OLF in recent years have typically not been conducted on weekends but may occur on weekends if required to support mission requirements. Additionally, the frequency and duration of flight operations are dependent on training requirements, weather, and a wide variety of other factors. Naval Air Station (NAS) Whidbey Island will continue to publish field carrier landing practice schedules and issue notifications for additional activities at the NAS Whidbey Island complex.

3.j. Flight Simulators

The Navy currently has six Growler flight simulators, all of which are located at Ault Field. Aircrew simulators are used on a daily basis by Growler squadrons and the fleet replacement squadron to satisfy a wide variety of flight-training requirements. However, there is simply no substitute for aircrew conducting training in a real aircraft, in real airspace, for perfecting field carrier landing practice at an on-shore airfield before attempting to land on an aircraft carrier. The Navy has learned how to best prepare pilots for the very demanding task of landing on an aircraft carrier and believes it has achieved the right combination of simulated and live training. The Navy uses flight simulation extensively for training. While simulator training is extremely valuable, it cannot replace the feel and physiological conditions experienced through live field carrier landing practice and cannot be used exclusively to certify pilots for landing on an aircraft carrier. It would be too dangerous to allow naval aircrews to perform the most dangerous task in military aviation--landing on an aircraft carrier--after using only simulators for their training. See Section 4.3.2.1, Flight Safety, for additional details.

3.k. Flight and Maintenance Noise Reduction

The Navy is considering noise-reduction measures, such as construction and operation of a noise-suppression facility for engine maintenance (also known as a “hush house”) at Naval Air Station Whidbey Island. The Navy is actively researching engine design solutions to reduce overall sound emissions from the engines of the F/A-18E/F “Super Hornet” and Growler. The Navy is also researching measures that may reduce the number of field carrier landing practices required in the future. Details on existing and potential noise mitigation can be found in Appendix H, Noise Mitigation.

4. Noise Associated with Aircraft Operations (Noise)

4.a. General Noise Modeling

Noise, potential noise effects, and noise impacts to resources are discussed within Sections 3.2 and 4.2. In addition, the noise study conducted for this analysis is included in Appendix A, and details on noise mitigation are included in Appendix H. The discussion of the NOISEMAP model, as well as the data inputs into the model (i.e., flight profiles, altitudes, flight tracks, etc.) that were used for this analysis, can be found in Section 3.2.2 as well as within Appendix A. The Navy is using the best available science, methods, and metrics to assess noise and to quantify its effects. NOISEMAP is the accepted U. S. Department of Defense standard for assessing noise impacts. The noise analysis conducted as part of this Environmental Impact Statement provides sufficient information for the decision maker regarding the Proposed Action.

The alternatives are compared to the No Action Alternative across the various noise metrics analyzed. The additional Growlers that would be located at Naval Air Station Whidbey Island under the Proposed Action are not included in the No Action Alternative; however, they are included under the alternatives based upon the allocations presented in Section 2.

4.b. NOISEMAP Model, Modeling Methodology, and Noise Sources

The discussion of the NOISEMAP model, which is the current, validated, and publicly available model that was used for this analysis, can be found in Section 3.2.2. Courts have affirmed noise modeling and the use of NOISEMAP as an appropriate method to assess noise impacts. In addition, text has been added to Section 1.11 regarding the Advanced Acoustic Model (AAM), which is still in development; therefore, AAM is not approved for use and was not used for this noise analysis.

The October 29, 2015, reference for NOISEMAP utilized in the Draft Environmental Impact Statement (EIS) was the date of the latest version of NOISEMAP (Version 7.2.2) utilized for the majority of analysis in the draft analysis. However, NOISEMAP was recently updated to include the direct calculation of supplemental metrics. After a U.S. Department of Defense (DoD) technical review of NOISEMAP 7.3, the new version was approved for use and released on March 29, 2017. All noise analysis has been updated utilizing this latest version for the Final EIS.

The Navy did measure noise in the development of the model. Details on the noise source data for NOISEMAP can be found in Section 3.2.2 of this EIS. NOISEMAP is the latest model available for aircraft noise for all DoD studies. It should be noted that the Federal Aviation Administration uses an integrated model similar to NOISEMAP for creating noise contours at commercial airports and does not plan, at this time, to change to another simulation model, such as AAM.

In addition to updating the noise analysis using the latest NOISEMAP Version 7.3 software, three other updates were made to the noise analysis. These include 1) applying refinements to certain flight profiles/aircraft operating assumptions, 2) incorporating the effects of Precision Landing Mode (PLM), also known as Maritime Augmented Guidance with Integrated Controls for Carrier Approach and Recovery Precision Enabling Technologies (MAGIC CARPET), into the noise analysis, and 3) updating the number of pilots per squadron. These refinements are discussed in more detail within Section 3.2 of the EIS.

4.c. Advanced Acoustic Model

The Advanced Acoustic Model (AAM) is based on the Rotorcraft Noise Model, which was developed by the National Aeronautics and Space Administration since the late 1990s. AAM extends the algorithms in the Rotorcraft Noise Model to apply to fixed-wing aircraft and adds the capability to account for nonlinear propagation effects and vectored thrust. AAM is still in development and not ready for use. The U. S. Department of Defense's (DoD's) current version of AAM (v1) does not properly account for the non-linear propagation of noise that is associated with tactical jet aircraft. The Air Force, which has fixed-wing model responsibility, is currently considering approaches to develop reference noise spheres created from legacy data so that older aircraft can also be modeling within AAM. After the DoD receives an updated version of AAM that incorporates nonlinear propagation and validated legacy noise spheres, the model will have to undergo final testing, evaluation, and validation by the Air Force before it can be utilized by DoD to support informed decision making regarding fixed-wing aircraft. Consequently, the Navy is continuing to utilize the latest version of NOISEMAP for modeling.

Wyle Report WR-1304, which is the *User Manual – Advanced Acoustic Model Technical Reference and User Manual* (SERDEP Project WP-1304, dated May 2009, describes the potential benefits of AAM and limitations of NOISEMAP for assessing next-generation aircraft primarily differentiated by vectored thrust ability and higher maximum thrust. These factors principally apply to fifth-generation aircraft, such as the F-22 and F-35. The F-22 is capable of generating more than 35,000 pounds of force (lbf) from each of its two engines. The F-35 produces 43,000 lbf of thrust from its single engine. The Growler utilizes two General Electric F414-GE-400 engines with reported thrust of 22,000 lbf with afterburner, significantly lower than the fifth-generation fighter aircraft. For comparison of historical aircraft, the maximum thrust for each of the two engines of the F-15C is 23,700 lbf with afterburner, while the F-14's two engines were each capable of 28,200 lbf with afterburner. For comparison to aircraft that have historically operated at NAS Whidbey Island, the Prowler engines each generate 10,400 lbf of thrust.

4.d. Day-Night Average Sound Level Metric

The day-night average sound level (DNL) metric is discussed in Section 3.2.2.1. DNL has been determined to be a reliable measure of long-term community annoyance from aircraft noise and has become the standard noise metric used as a federal standard for measuring noise impacts. The DNL metric is the industry standard methodology, supported by guidance from the Federal Aviation Administration (FAA), U.S. Environmental Protection Agency, Department of Defense (DoD), Federal Interagency Committee on Noise, American National Standards Institute, and World Health Organization, among others, and is the most accurate and valid method for evaluating the impacts of noise under current and future conditions. As a federal standard, the DNL metric is used by many state and local governments, including Island County, in their land-use planning and zoning ordinances. In addition, the use of 65 decibels (dB) DNL is the established federal standard for determining potential for high annoyance. This sound level has been identified in both the FAA's Part 150 Program and the DoD's Air Installations Compatible Use Zones (AICUZ) Program (including the individual Air Force and Navy programs) as a threshold for land use recommendations. Land use guidelines for evaluating acceptable noise levels were developed based upon 365-day averaging, and the analysis remains consistent with that standard. If solely active flying days had been computed, the results would not be applicable to the established guidelines (based on 365-day averaging) and could not be applied directly.

Some commenters have noted that the DNL metric is an average metric over the course of an entire year, whereas the airfields at the Naval Air Station (NAS) Whidbey Island complex do not necessarily have aircraft operations every day throughout the year; therefore, noise should be assessed on active flying days (this topic is also discussed in Section 3.1.2 of the Environmental Impact Statement [EIS]). The DNL metric is not particularly sensitive to the modeled number of days per year, meaning the results do not vary drastically if the aircraft noise is averaged over the entire 365-day calendar year, or a number of days less than that number. The noise contour results are dictated more by what aircraft are flying, the types of operations they are conducting, and their frequency of operations. The NAS Whidbey Island complex typically operates 5 days per week, or approximately 260 days per year. If the DNL metric for the analysis were utilized 260 days per year, the DNL values would only increase by approximately 1.5 dB beyond those computed for 365 days per year. This 1.5 dB adjustment would apply equally to both the existing condition and the proposed scenarios, so the increases reported under the Proposed Action would not change regardless of the number of flying days used for the analysis. Additionally, the use of Average Busy Day (ABD) would fail to account for the benefit the Navy's minimal weekend operations would have on those days, which are days when people are less likely to be away from their homes at

work. Also, ABD used for an analysis with multiple scenarios can be misleading. For example, if an airfield doubles operations but also doubles its flying days, the resulting DNL will not change with all else being equal.

In 1974, the U. S. Environmental Protection Agency published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (March 1974), also known as the "Levels Document," that reviewed the factors that affected communities. DNL (still known as L_{dn} at the time) was identified as an appropriate noise metric, and threshold criteria were recommended. Threshold criteria for annoyance were identified from social surveys in which people exposed to noise were asked how it affected them. Surveys provide direct, real-world data on how noise affects actual residents. In 1978, noise researcher T. J. Schultz showed that the common ground among studies was the number of people "highly annoyed," defined as the upper 28-percent range of whatever response scale a survey used. Consistent with World Health Organization recommendations, the Federal Interagency Committee on Noise considered the "Schultz Curve" to be the best source of dose information to predict community response to noise but recommended further research to investigate the differences in perception of noise from different sources. While more recent research has shown that people may be more sensitive to today's noise environment, the 1978 Schultz Curve is still recognized in the United States and enacted in land-use ordinances at the federal, state, and local levels. For additional details regarding the latest analysis related to people highly annoyed by noise and related noise exposure, refer to Appendix A1 (Section A.3.1) of the Aircraft Noise Study (Appendix A).

Because DNL is an average and is often viewed as an inadequate prediction of annoyance to single-event aircraft noise, the analysis includes supplemental analyses. The analysis evaluated 48 points of interest in the community, of which 30 representative locations were analyzed for potential indoor speech interference, 30 locations for potential for sleep disturbance, 12 locations for potential for classroom learning interruption, and 48 locations for recreation and outdoor speech interference. The supplemental analyses utilize the appropriate single-event metrics that include Maximum Sound Level (L_{max}), Sound Exposure Level (SEL), and numbers of events above (NA), a threshold level consistent with U. S. Department of Defense guidance (see Sections 4.2.2.2, 4.2.3.2, and 4.2.4.2).

4.e. Day-Night Average Sound Level Contours and Noise

The day-night average sound level (DNL) metric is discussed in Section 3.2.2.1. Within that discussion, it is noted that the 65 decibel (dB) DNL is the established federal standard for determining potential for high annoyance. This level has been identified in both the Federal Aviation Administration's Part 150 Program and the Department of Defense's (DoD's) Air Installations Compatible Use Zones Program (including the individual Air Force and Navy programs) as a threshold for land use recommendations. Consistent with this guidance, 65 dB DNL is used to show areas with potential for high annoyance in this analysis. However, aircraft noise does occur outside the 65 dB DNL contour. In order to more fully reflect the noise environment, the Draft Environmental Impact Statement (EIS) included noise contours of 60 dB DNL, as well as detailed noise analysis for specific points of interest. In response to public comments, the Navy has expanded the analysis in the Final EIS to show geographic areas subject to greater than 55 dB DNL, and has analyzed 18 additional points of interest.

For additional details related to the latest analysis regarding people highly annoyed by noise and related noise exposure, refer to Appendix A1 (Section A.3.1) of the Aircraft Noise Study (Appendix A). Land use guidelines for evaluating acceptable noise levels were developed based upon 365-day averaging. The

analysis remains consistent with that standard. There are increases to the size of the DNL noise contours under each of the proposed alternatives/scenarios presented in Section 4.2. Under all alternative/scenario combinations, the land area within the DNL noise contours would increase, but it would do so to varying degrees. The tables and figures throughout Section 4.2 show the estimated change in acreage and consequent estimated change in the population within the noise contours, including the 65 dB DNL, 70 dB DNL, and greater than 75 dB DNL contours, and tabulate these data by Ault Field, Outlying Landing Field Coupeville, and total. Based upon public comments, municipal boundaries for cities and towns around the two airfields have been added to show their location in relation to the DNL noise contours.

Many commenters have noted that the 65 dB DNL threshold is not adequate because it does not reflect that noise exists outside the 65 dB DNL noise contour. See Section 3.2.2, which explains how DNL is calculated and why it is a valuable metric to measure community annoyance. The Navy recognizes that high levels of noise can occur outside of the 65 dB DNL noise contour. For this reason, the Navy selected points of interest throughout the community, including a large number outside of the dB DNL noise contours, and used supplemental metrics to provide a more comprehensive presentation of the noise environment (see Sections 3.2 and 4.2).

4.f. Noise Measurements/Modeling/On-Site Validation

Measuring current noise conditions and/or monitoring future noise conditions, as well as collecting subjective/experiential data, are not being considered. In addition, the results of the National Park Service's noise study affirm the results modeled by the Navy, and additional noise monitoring would not change the results of the impacts presented in this analysis.

The discussion of the NOISEMAP model, as well as the data inputs into the model that were used for this analysis, can be found in Section 3.2.2. NOISEMAP is the accepted U.S. Department of Defense standard for assessing noise impacts.

4.g. Average Annual Day/Average Busy Day Noise Levels

Some commenters have stated that the Navy should have used the Average Busy Day (ABD) methodology found in the Navy's Air Installations Compatible Use Zones instruction. The ABD methodology is not appropriate for this analysis for the reasons stated in Section 3.1.2.

4.h. C-Weighted Noise, Low Frequency Noise, and Vibrations

For a discussion on noise, refer to Section 3.2 and Appendix A (Aircraft Noise Study). A-weighting best replicates human hearing and is the most appropriate for the assessment of annoyance from aircraft noise. A-weighted sound levels form the basis of the day-night average sound level (DNL) metric, which is the best available metric to relate aircraft noise to long-term annoyance. The Federal Interagency Committee on Noise found that "There are no new descriptors or metrics of sufficient scientific standing to substitute for the present DNL cumulative noise exposure metric."

Commenters have suggested that A-weighted measures may not be as accurate in determining the disturbing effects of noises with strong low-frequency components. However, the alternative measurement methodology using C-weighting increases the emphasis on lower frequencies when compared with A-weighting. C-weighting is most appropriate for impulsive or repetitive sounds, such as blast noise and machine gun fire, which contain significant low-frequency noise, as well as continuous

noise sources such as pumps and compressors. The Federal Aviation Administration continues to recommend and utilize DNL and A-weighting for airfield noise studies, and the U. S. Department of Defense (DoD) methodology used in the Environmental Impact Statement is consistent with all applicable federal standards. The majority of the journal articles and studies reviewed as part of this assessment used the A-weighted noise measurement, while a few used unweighted noise and a small number used C-weighted noise as part of their analysis.

The low-frequency sound characteristics of the Growler vary from those of the Prowler, which previously operated at Naval Air Station Whidbey Island, but are quite similar to the sound characteristics of typical fighter aircraft. The Growler generates the greatest sound pressure levels at frequencies between 200 and 4,000 Hertz, consistent with the sound pressure levels of many commercial jetliners, and noise impact analyses for these commercial jetliners utilize A-weighted DNL measurements. The Prowler actually generated additional mid-to-higher frequency noise in the 4,000 to 10,000 Hertz range, which is atypical of most commercial aircraft and jet fighter aircraft, and is therefore unique.

Common complaints associated with low-frequency vibrations depend on the individual perceiving the noise, but they could include annoyance/fright, concerns about structural effects on homes, or potential health effects. These are discussed in Section 4.2, as well as in Appendix A.

The 15 decibel (dB) and 25 dB attenuation levels for, respectively, windows-open and windows-closed conditions utilized in this analysis are consistent with DoD guidance. These values already account for the reduced attenuation at lower frequencies as well as the greater attenuation at high frequencies. The supplemental metrics that include assumed values of structure attenuation (sleep disturbance, speech interference, and classroom learning) apply the same attenuation to all scenarios. The analysis focuses on a “before-and-after” comparison of the Proposed Action to existing conditions, which effectively reduces or completely eliminates the impact of variances in assumed structure attenuation.

4.i. Other Noise Metrics Not Currently in Analysis

As stated in Section 3.2, the day-night average sound level (DNL) is the standard and federally accepted metric for assessing community annoyance due to aircraft noise impacts. Effective Perceived Noise Level and Weighted Equivalent Continuous Perceived Noise Level are typically used only for engine certification. In addition, Effective Perceived Noise Level and Weighted Continuous Perceived Noise Level are analogous to sound exposure level (SEL) in that both are best suited to single-event analysis. For this reason, the industry standard metric for measuring annoyance remains DNL, and SEL is the accepted supplemental metric for assessing single-event sound levels. The Federal Interagency Committee on Noise found “There are no new descriptors or metrics of sufficient scientific standing to substitute for the present DNL cumulative noise exposure metric.” The Federal Aviation Administration continues to recommend and utilize DNL, and the U. S. Department of Defense methodology remains consistent. To include Effective Perceived Noise Level and Weighted Equivalent Continuous Perceived Noise Level would not provide significant value.

DNL is considered an annoyance metric that relates long-term community exposure to the percentage highly annoyed. Other metrics, such as Community Noise Equivalent Level (or CNEL), are used in California; however, it is not utilized nearly as much as DNL and is not as prevalent in scientific literature that correlates noise to high annoyance levels. DNL is widely considered the standard when assessing annoyance and noise.

4.j. Other Reports

Several other reports, some of which are noise-related, examine both measured and experiential noise in the areas near and far from Naval Air Station (NAS) Whidbey Island. These include the National Park Service Report for Ebey's Landing National Historical Reserve (2016), the Dahlgren Report on Combat Jet Noise from Landing and Taking Off at Whidbey Island Outlying Landing Field (OLF) Coupeville (2015), the JGL Acoustics, Inc., Report on Whidbey Island Military Jet Noise Measurements (2013), and the San Juan County Jet Aircraft Noise Reporting (2014 to present), among others; these are discussed in Section 1.12.

4.k. Comparison of the Prowler to the Growler

The Proposed Action does not include analysis of the transition of the Prowler to the Growler, which was completed in June 2016. The Prowler aircraft has been retired and no longer operates at the Naval Air Station (NAS) Whidbey Island complex. This Proposed Action includes additional Growler aircraft that would operate at the NAS Whidbey Island complex; therefore, a comparison of two different aircraft is irrelevant to the Proposed Action. The comparison of the Prowler aircraft to the Growler aircraft was discussed in the 2005 Environmental Assessment for that transition before Congress appropriated funds to purchase an additional 36 Growler aircraft.

4.l. Points of Interest

As discussed in Section 3.2, the day-night average sound level (DNL) metric depicts average sound, and it is the federally accepted metric for assessing community noise impacts. However, since average sound (DNL) is not what one hears and because the Navy acknowledges that aircraft noise does not stop at the 65 decibel (dB) DNL noise contour depicted around Ault Field and Outlying Landing Field (OLF) Coupeville, the Navy included several supplemental metrics that provide information on single-event noise. These include the maximum sound level, sound exposure level, number of events above a threshold, indoor and outdoor speech interference, probability of awakening, and classroom learning interference. These metrics are related to single noise events, rather than an average, and are also associated with representative points of interest where an individual may experience these noise events. The analysis of single noise events is presented throughout Sections 3.2 and 4.2.

The noise analysis in the Draft Environmental Impact Statement evaluated supplemental metrics at 30 points of interest (POIs), which included a mix of residential areas, parks, and schools. Based upon public input, an additional 18 POIs have been added to the noise analysis. The analysis of 48 POIs is beyond what is typically conducted for an aircraft noise analysis, and it provides a comprehensive picture of the noise impacts not only around the two airfields but also around the region for areas 20 to 30 miles away. These additional 18 POIs included additional residential areas, schools, and parks, as well as two points in Ebey's Landing National Historical Reserve as identified in the National Park Service's acoustical monitoring report. The two points from that report (designated as EBLA001 [Reuble Farmstead] and EBLA002 [Ferry House]) correspond to POIs P18 and P17, respectively, in this Environmental Impact Statement (EIS). In addition, the analysis of outdoor speech interference was also included for all POIs, as well as broken out between estimated daytime and nighttime operations for residential areas and schools because individuals would spend time outdoors at both of those types of locations. In general, the POIs were chosen based upon several factors, including geographic dispersal from the airfields and under flight operations, near major or identifiable landmarks, and areas that have had a history of noise impacts. It should be noted that for POIs located closely to one another (i.e., within about 0.25 mile,

depending on topography), the results will most likely be the same or very similar and thus not add value to the analysis. Furthermore, it is possible to deduce the potential noise impacts for a specific location based on its proximity to a POI and its distance from the airfields. In addition, despite particular POIs being designated as a residence, school, or park, several of the POIs are also used as surrogates for relevant supplemental metrics. For instance, all of the "school" POIs also are included in the tables presenting the probability of awakening data because it is assumed that schools are located within residential areas.

Certain POIs may experience a lower maximum sound level or sound exposure level between the No Action Alternative and the alternatives. This would most likely be due to the standardization of some of the flight tracks at OLF Coupeville.

4.m. Supplemental Metrics

Please see Section 3.2.2 and Appendix A for a discussion of the various noise metrics used in this analysis as well as modeling assumptions and the applicability and use of the day-night average sound level (DNL) metric in the Environmental Impact Statement (EIS) analysis. DNL has been determined to be a reliable measure of long-term community annoyance from aircraft noise and has become the standard noise metric used by federal agencies for measuring noise impacts. The Federal Aviation Administration, U.S. Environmental Protection Agency, U.S. Department of Defense, Federal Interagency Committee on Noise, American National Standards Institute, and World Health Organization, among others, use the DNL noise metric. As the federal standard, many state and local governments have included DNL noise contours in their land-use planning and zoning ordinances, including Island County. While the DNL noise metric is the federal standard for analyzing the cumulative noise exposure from all aircraft operations, additional metrics to supplement the noise analysis have been developed. These supplemental metrics and analysis tools provide more detailed noise exposure information for the decision makers to consider, including noise from single events, and improve the overall discussion of noise exposure. These supplemental metrics are also based upon what an individual may experience when aircraft are flying in the vicinity and, therefore, may be more appropriate for describing what visitors and/or tourists to the area may encounter. However, it should be kept in mind that these are still averages, and, on a given day, an individual may experience more or fewer noise events than are presented in the EIS.

In response to inputs and public comments, the EIS analyzed the potential impacts of noise exposure as it relates to specific noise events at 48 points of interest. As a result, the analysis provided a comprehensive picture of noise impacts in the region up to 30 miles away from Ault Field and Outlying Landing Field Coupeville. The following supplemental noise metrics were analyzed: single-event noise levels (sound exposure level and maximum noise level), number of events above a threshold, indoor speech interference, classroom/learning interference, sleep disturbance, and potential noise effects on recreation (i.e., outdoor speech interference). In addition, from the Draft EIS to the Final EIS, an outdoor speech interference analysis was added to all residential and school points of interest based upon public comments received and resident and student activities outdoors. The results of this analysis vary depending on the alternative/scenario and the annual operations modeled. To understand the full impact of these supplemental metrics, see Section 4.2.2.2 (Alternative 1), 4.2.3.2 (Alternative 2), or 4.2.4.2 (Alternative 3). To understand how the 48 points of interest were selected, see Section 3.2.4.3 of this EIS or Response 4.i.

4.n. Speech Interference (Indoor and Outdoor)

The Environmental Impact Statement (EIS) evaluates indoor and outdoor (recreational) speech interference within Sections 3.2 and 4.2, as well as in Appendix A. The analysis utilizes supplemental metrics to identify potential impacts from noise exposure that could be realized under the alternatives, including additional events of indoor and outdoor speech interference. Sections 3.5.2.5 and 4.5.2.2 (Recreation and Wilderness) include a discussion on noise effects on outdoor recreational experiences and areas. Consistent with other U. S. Department of Defense environmental documents, the analysis includes outdoor speech interference measured by the number of average daily daytime and nighttime events per hour subject to outdoor maximum sound level of at least 50 decibels (dB). The 50 dB threshold matches the sound level at the listener analyzed for interior speech interference. In addition, based on public input on the Draft EIS, outdoor speech interference analysis was included for all 48 points of interest, including residences, schools, and parks.

4.o. Classroom Learning Interference

Classroom learning and indoor speech interference are discussed in Sections 3.2 and 4.2, as well as in Appendix A1. The analysis includes classroom interruptions during an 8-hour school day from 8:00 a.m. to 4:00 p.m., Monday through Friday. The methodology of average interrupting events during school hours is utilized for the No Action Alternative conditions and the alternatives and is the most practical way to compare the impacts across all scenarios. The average number of interrupting events per hour would increase by up to one-third at several schools. Since actual flight schedules and times would vary throughout the year, some days and hours would have more frequent interrupting events than the stated average, while during other days and hours they would have no interrupting events when Growler aircraft are not operating at Ault Field or Outlying Landing Field Coupeville. In addition, the Navy has historically worked with the school districts in the communities surrounding the airfields to best minimize impacts, where practicable, including minimizing flight activity during major school testing dates (see Section 4.2.6).

In the Draft Environmental Impact Statement (EIS), seven schools and two residential points of interest used as school surrogates were analyzed for classroom learning interference. In addition, based on public input, three schools were added to this analysis, for a total of 12 locations. Additionally, information regarding the noise levels in portable classrooms was added. See Section 4.2 for a detailed analysis of aircraft noise at these points of interest in relation to cognitive abilities. In addition to analysis of buildings considered to have sound attenuation, based on public input on the Draft EIS, outdoor speech interference analysis was included for all 48 points of interest, including the 10 schools and two school surrogates.

Additional information and discussion on noise impacts to academic performance, including state-wide assessments, was added to Appendix I. Applicable peer-reviewed studies were incorporated into the analysis. Many factors may influence academic performance, such as an engaging curriculum, teacher experience, parental involvement, students' attitudes toward education, and the school environment. In general, the noise environment can impair learning in schools and may contribute to poor academic performance of an individual student. Based on the test scores and graduation rates analyzed in Appendix I, students in local schools districts are more academically successful than many of their peers across the State of Washington as a whole.

The Navy has not sought additional appropriations for improvements to state or private property. Specific Congressional authorization and appropriation would be required for such funding. The Navy does not intend to seek specific Congressional authorization and appropriation of funds for these purposes to support the increase in Growler operations. The decision to implement sound attenuation is a choice made by local governments and school boards.

Work and homework disturbance were not quantified in the analysis; however, a qualitative discussion of work and homework disturbance was added to Section 4.2. Generally, the number of work and homework disturbance events can be assumed to be similar to the number of speech interference events or classroom learning interference events, presented in Sections 3.2 and 4.2.

Generally speaking, aircraft noise, classroom learning interference, sleep disturbance, and health are all related in a number of ways. As discussed in Section 4.2, the probability of awakening from sleep increases under all alternatives. Sleep disturbance may impact students' ability to learn. Additionally, impaired learning and poor academic performance can lead to increased student stress, which has a number of health outcomes. Furthermore, at-risk students, such as those with special needs, may be adversely affected at lower sound levels. Applicable peer-reviewed studies related to classroom learning and health were reviewed, and those that were relevant to the Proposed Action and are peer reviewed were incorporated into the analysis in Appendix A1.

4.p. Sleep Disturbance

As discussed in Sections 3.2 and 4.2, the analysis uses the standard methodology for calculating sleep disturbance from noise. Noise effects on health, including lack of sleep due to noise, are discussed within Appendix A1. U. S. Department of Defense guidelines for evaluating sleep disturbance are based upon methodology and standards developed by the American National Standards Institute and the Acoustical Society of America in 2008, and these methodologies and standards are used widely in National Environmental Policy Act documents. Additional details regarding level of residential sound attenuation, sound exposure level, and number of events assumed in the modeling were added to Section 3.2. The American National Standards Institute methodology does not quantify noise impacts to the process of falling asleep. Information regarding the number of nights the Naval Air Station Whidbey Island complex is expected to conduct field carrier landing practice under each alternative was also added to Section 4.2. The potential for field carrier landing practice to disturb sleep is higher in the summer because, for pilots needing nighttime training, sunset occurs much later in the evening during the summer and therefore flights are more likely to occur while individuals are sleeping.

The probability-of-awakening information presented in Sections 3.2 and 4.2 is based upon individuals sleeping indoors. Sleeping outdoors or in a tent does not provide the sound attenuation associated with a house; therefore, there would be a higher probability of awakening while camping and sleeping outside. In order to approximate the amount of potential sleep disturbance that might occur if an individual were sleeping outdoors in a tent, the number of events above a Maximum Sound Level of 50 decibels per hour was calculated and is included in the outdoor speech interference tables in Sections 3.2 and 4.2. This would not have the sound attenuation that is part of the probability of awakening metric but serves to provide the decision maker with an average change of nighttime events that may result in awakening. It should be noted that this is on an average basis; therefore, there may be nights when there are more events per hour and other nights when there are fewer events per hour. In addition, noise impacts on recreational activities are discussed in Sections 3.5.2.5 and 4.5.2.2.

4.q. Potential Hearing Loss

As part of this analysis, an evaluation of the risk of potential hearing loss for (human) populations in the areas around the Naval Air Station Whidbey Island complex was conducted (including both Ault Field and Outlying Landing Field [OLF] Coupeville). Details on the potential hearing loss metric, methodology for the analysis, and assumptions are outlined in Section 3.2, as well as in Appendix A1. The original basis for the metric is grounded in the 1982 U.S. Environmental Protection Agency Guidelines for Noise Impact Analysis. These guidelines provide that people who experience continuous, daily exposure to high noise over a normal working lifetime of 40 years, with exposure lasting 8 hours per day and beginning at an age of 20 years old, may be at risk for a type of hearing loss called Noise Induced Permanent Threshold Shift (NIPTS). The current Defense Noise Working Group guidance outlines the process for identifying potential at-risk populations that may experience NIPTS, and this guidance was followed for the analysis. While hearing loss is unlikely, the analysis is presented in Sections 3.2 and 4.2 and includes an estimation of at-risk populations with both average hearing sensitivity and more highly sensitive hearing. The potential at-risk populations would be located in high-noise areas in close proximity to the airfields and are tabulated by Ault Field, OLF Coupeville, and total. In addition, based upon public comments, municipal boundaries for cities and towns around the two airfields have been added to show their location in relation to the day-night average sound level noise contours.

However, it should be noted that this guidance is extremely conservative and based upon the assumption that individuals are outdoors at their residence and exposed to all aircraft activity for 40 years. This is coupled with the fact that according to national averages, individuals are indoors approximately 87 percent of their day, and it would be unlikely that they would be exposed to this level of noise without some degree of sound attenuation. The amount of time spent outdoors varies between individuals, seasons, geography, and other factors; however, 13 percent of an individual's days is a reasonable average.

This is an analysis that identifies potential at-risk populations but does not attempt to provide a definitive measurement of hearing loss. This information has been included in the analysis and is available as part of the information for decision makers to consider with respect to the Proposed Action.

4.r. Nonauditory Health Effects

The Environmental Impact Statement (EIS) analysis considers the potential for aircraft noise to impact one's health, as discussed throughout Section 4.2 and Appendix A1. A review of existing literature addressing nonauditory health effects from aircraft noise exposure was included in the Draft EIS. In addition to this and based upon public comment, specifically from the State of Washington Department of Health, the U.S. Environmental Protection Agency, and other public comments, requests were received to review additional published articles. In preparation of the Final EIS, the Navy reviewed 260 published articles as suggested by public comment. An in-depth review of these documents is provided in Appendix A1 of the Aircraft Noise Study. The Navy's review identified that many of these studies already had been reviewed and included in the Navy's literature review or were referenced in or by studies the Navy had already considered. However, expanded information has been incorporated as appropriate. See Appendix A8 for details on the literature review process. Additional topics discussed include, but are not limited to, hypertension and cardiovascular health, lack of sleep, stress, and anxiety. Noise effects on health are discussed in Section 4.2 as well as in Appendix A1. In addition, lack of sleep due to noise, during pregnancy, and among particularly susceptible populations is discussed within

Appendix A1. Most of the journals and studies reviewed as part of this assessment used the A-weighted noise metric, while a few used unweighted noise, and a small number used C-weighted noise as part of their analysis.

Numerous epidemiological studies and meta-analyses have been conducted on the long-term health impacts of exposure to noise; these are summarized in Appendix A1 and Section 4.2 of this EIS. These studies and analyses are primarily a narrative review of the basic premise of these studies, which is that noise can cause annoyance, annoyance can cause stress, and prolonged stress is known to be a contributor to a number of health disorders, such as hypertension, myocardial infarction (heart attack), cardiovascular disease, and stroke.

The National Environmental Policy Act does not require the Navy to develop best available science when the "overall costs of obtaining it [the information] are exorbitant or the means to obtain it are not known." Therefore, the Navy must rely on the best existing scientific data to determine the potential for impacts. Based on an exhaustive literature review, which was updated based on public comments, it is not possible to state that there is sound scientific evidence that aircraft noise is a significant contributor to health disorders. The analysis determination that there would be no significant adverse nonauditory health effects does not necessarily exclude the possibility of less than significant adverse health effects (see Appendix A1 and Section 4.2). In addition, an individual's health is greatly influenced by many confounding factors known to cause health issues (e.g., heredity, medical history, smoking, diet and exercise). These confounding factors have a larger and more direct effect on an individual's overall health than intermittent exposure to aircraft noise.

4.s. Health Impact Assessment and Long-term Health Study Requests

Health Assessment Requests: Commenters requested the Navy conduct its own long-term health study of Island County. Specifically, the U.S. Environmental Protection Agency (USEPA) and the Washington Department of Health (WADOH) have asked the Navy in comments to conduct a "Health Impact Assessment (HIA)." The initial comments did not clarify exactly what the USEPA and WADOH desired by asking for an HIA, because HIAs are National Environmental Policy Act (NEPA)-like documents associated with proposed actions and are often limited to reviews of current literature that may be relevant to certain health impacts associated with a proposed action. To this end, an HIA would merely duplicate, and in many cases would be far less comprehensive than, this Environmental Impact Statement (EIS). Not only did the Navy conduct a comprehensive review of the best available science, it also conducted a comprehensive qualitative analysis using several metrics to measure impacts to the human environment that far exceeds the analysis of an HIA. To the extent that the intent is not to perform an HIA but to conduct a long-term, scientific research study on the impacts of aircraft noise and human health, such a study is beyond the scope of this analysis. In follow-on discussions with USEPA staff, it was agreed that the EIS already contained a substantial analysis regarding both auditory and nonauditory impacts from aircraft noise and that placing this information in one comprehensive appendix would help present this information to the public (see Appendix I of this EIS and the Noise and Health Reader's Guide in the Executive Summary).

As previously stated, the Navy conducting its own long-term health study or HIA of Island County is beyond the existing scientific literature, would take years, and is outside of the scope of the analysis. In accordance with 40 Code of Federal Regulations 1502.22, the Navy intends to clarify and highlight the use of best available science and data and make clear that some information is incomplete or

unavailable. NEPA does not require the Navy to develop best available science when the "overall costs of obtaining it [the information] are exorbitant or the means to obtain it are not known," and therefore the Navy must utilize best available science and data for the analysis. Despite the intuitive feeling that noise in some way must impair health and some non-scientific articles supporting this theory, there are no studies that definitively show a causal and significant relationship between aircraft noise and health. Such studies are notoriously difficult to conduct and interpret because of the large number of confounding factors that have to be considered for their effects to be excluded from the analysis. The World Health Organization notes there is still considerable variation among studies. Almost without exception, research studies conclude that additional research is needed to determine whether such a causal relationship between noise and human health exists. The European Network on Noise and Health, in its summary report of 2013, concludes "…while the literature on non-auditory health effects of environmental noise is extensive, the scientific evidence of the relationship between noise and non-auditory effects is still contradictory." Because the best available science does not definitively show a causal and significant relationship between aircraft noise and health, it would be speculative to link any nonauditory health data collected to aircraft noise instead of to other factors.

Per recommendations from public comment letters, the Navy reviewed the referenced literature submitted by the WADOH and USEPA and other public comments, and took an extensive look at the best available science; a summation of those journal articles has been added to Appendix A1. These studies were in addition to an already thorough review of literature presented in the Draft EIS. In addition, the Navy looked at community health and learning and other HIAs conducted from aircraft noise and presented the findings in Appendix I of this EIS. The EIS also includes a Noise and Health Reader's Guide, which is intended to assist readers in locating information within the EIS related to potential health effects of noise. The guide is located in the Executive Summary, just prior to the Table of Contents.

Based on the Navy's extensive literature review and qualitative analysis of impacts using best available science and long-standing government and industry standards, the Navy believes it has the information it requires to assess potential impacts from the Proposed Action.

4.t. Noise Mitigation

Naval Air Station (NAS) Whidbey Island's policy is to conduct required training and operational flights with a minimal noise impact on surrounding communities. Numerous noise-abatement procedures are specified in the current air operations manual (NASWHIDBEYINST 3710.1AA) for NAS Whidbey Island. Airfield procedures employed to minimize or abate noise for operations conducted at the NAS Whidbey Island airfields include optimization of flight tracks, restricting maintenance run-up hours, runway optimization, and other procedures, many of which are used at other commercial, private, and military airfields. Refer to Sections 1.11, 2.2, 2.4.2, 2.4.3, 3.1, 3.2.4.2, 4.2.6, and Appendix H for discussion of the Navy's noise abatement procedures at NAS Whidbey Island and noise mitigation measures.

NAS Whidbey Island has historically worked with federal, state, and local elected officials and agencies from surrounding communities to best minimize impacts where practicable, including minimizing flying at Outlying Landing Field (OLF) Coupeville on weekends and minimizing flight activity during major school testing dates and major community events. The Navy will continue to evaluate advances in technology as well as evaluating policies and procedures to minimize, reduce, and mitigate impacts to the community as much as practicable.

Section 4.2.6, Noise Mitigation, and Appendix H include discussion of potential mitigation measures, including facility and technology solutions such as a hush house and chevrons. In addition, a discussion is included for Precision Landing Mode (PLM), also known as Maritime Augmented Guidance with Integrated Controls for Carrier Approach and Recovery Precision Enabling Technologies, or MAGIC CARPET), which is a new operational capability that has a noise-mitigating benefit. As such, it should be noted, and as discussed in Section 3.2, one of the noise modeling refinements between the Draft EIS and the Final EIS was updating the noise analysis assuming the full implementation of PLM at NAS Whidbey Island, which included an overall reduction of field carrier landing practice (FCLP) requirements by 20 percent and led to a reduction in the number of FLCP operations (from a high of 43,000 FCLPs in the Draft EIS to a high of 29,000 FCLPs in the Final EIS). This assumption was applied to both the No Action Alternative as well as the various alternatives and scenarios, as it is an independent effort being implemented by the Navy and is not dependent on the Proposed Action.

Many public commenters suggested noise mitigation techniques for the Navy to consider. Specifically, some commenters have suggested that the Navy should have analyzed the use of unmanned aircraft to meet the Growler mission. No such aircraft exist that can perform the electronic attack mission, so no such alternative or mitigation is available. Some commenters have suggested that the Navy should install blast deflectors as noise mitigation. Blast deflectors, however, do not mitigate noise but instead are intended to prevent jet blast from injuring people or damaging property by deflecting a jet's exhaust. To the extent blast deflectors mitigate any noise, they do so only on the installation itself and immediately adjacent to the deflector. In addition, blast deflectors would not reduce the noise of aircraft operations in flight.

4.u. Local Noise Ordinances

Although local noise ordinances do not apply to U.S. government activities, this Environmental Impact Statement did consider them in Sections 4.2 and 4.5. Furthermore, Washington Administrative Code Chapter 173-60-050 (3)(b) exempts sounds originating from aircraft in flight and sounds that originate at airports that are directly related to flight operations from noise regulations and/or ordinances.

4.v. Impacts to Domestic Pets, Livestock, or Wildlife

Potential impacts to domestic animals, including cattle, horses, swine, and domestic fowl, as well as various mammals and wildlife, are discussed in Appendix A1, as well as in Sections 3.8 and 4.8, Biological Resources. Noise effects on household pets would be similar to those described for other domestic animals.

5. Public Health and Safety

5.a. Accident Potential Zones

Most aircraft mishaps occur on or near the runway, with mishaps diminishing in likelihood with distance. Based on studies of historical mishaps, the Navy and other services have identified Accident Potential Zones (APZs) (see Section 3.3.1). While APZs do not predict the likelihood of an aircraft mishap, they do predict the most likely location of an aircraft accident, if one were to occur.

The Environmental Impact Statement (EIS) analyzed the flight operations for each alternative where they generally utilized the same arrival, departure, or pattern flight tracks to identify where new

potential APZs would be needed. The EIS concludes that no new APZs would be needed at Ault Field, and APZs may be needed at Outlying Landing Field (OLF) Coupeville depending on the alternative and scenario selected. The EIS depicts these conceptual APZs (see Section 4.3.2.3). The Navy's official recommendation for APZs at OLF Coupeville will be confirmed through the Air Installations Compatible Use Zones study process. However, it is up to the municipality to consider and establish an APZ for OLF Coupeville and to adopt zoning to enhance public safety. It is the municipality's action that will influence future land use decisions. In fact, the municipality has choice on the degree to which it implements the Navy's recommendations. Section 4.5.2.1, Land Use, Potential Impacts, Land Use Compatibility, analyzes the land use types under the conceptual APZs.

OLF Coupeville also had APZs recommended as part of the 1986 AICUZ process that reflected the field carrier landing practice patterns of the time; however, the recommended APZs were never adopted by the local municipality. During the 2005 AICUZ process, it was determined that additional APZ coverage was not warranted at that time because operational numbers were below the threshold (approximately 5,000 operations per approach or departure flight track) for the establishment of APZs at that location. Therefore, only Clear Zones are currently present at OLF Coupeville runways.

5.b. Overtasking/Overloading of Air Traffic Control at Ault Field and Elsewhere

More aircraft operating in and around the Naval Air Station (NAS) Whidbey Island complex would certainly increase the tasking and load of air traffic controllers and ground support personnel, as well as aircrew members (pilots) themselves. The analysis examines existing airspace conditions in Section 3.1 and impacts to airspace under each alternative in Section 4.1. Modeled airfield operations at the NAS Whidbey Island complex and existing airspace and procedures can accommodate increased operations except for Scenario C under all alternatives. An expected increase in scheduling challenges and the potential for mission delays could occur at Ault Field under Scenario C, which could cause deficiencies in pilot proficiency and unit readiness.

5.c. Condition of Outlying Landing Field Coupeville

Some commenters have suggested that Outlying Landing Field (OLF) Coupeville is insufficient or unsafe to use because of its length. While OLF Coupeville's 5,400-foot runway is the shortest field carrier landing practice (FCLP) runway in the Navy, it does meet length requirements for supporting EA-18G FCLP. A longer runway would be appropriate if Growlers intended to conduct full-stop landings at the OLF. Growlers do not do so, and such a stop would only be contemplated in the event of an emergency. In case of an emergency, OLF Coupeville has arresting gear, and Ault Field can serve as a diversion airfield due to its close proximity (see Section 3.3.2 and Appendix G of this Environmental Impact Statement). Appendix G, Civilian Airfield Analysis, discusses runway length and adequacy.

5.d. Environmental Health Risks and Safety Risks to Children

As described in Section 3.3.1.4, the president issued Executive Order 13045, Environmental Health Risks and Safety Risks to Children, on April 21, 1997. This order requires each federal agency to "make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and shall . . . ensure that its policies, programs, activities, and standards address disproportionate risks to children." This order was issued because a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks.

In accordance with Executive Order 13045, the Navy studied whether the impacts identified in the analysis would disproportionately impact children under the Proposed Action. The population living within the greater than 65 decibel day-night average sound level noise contours, including children, would be impacted by aircraft noise and have the potential to be impacted by aircraft mishaps. The Navy concludes (see Section 4.3.2.4) that although additional children would be impacted by the noise, the Navy does not anticipate any significant disproportionate health impacts to children caused by the aircraft noise. In addition, the Navy concludes there is no disproportionate environmental health and safety risk to children from possible aircraft mishaps because there are no schools or areas where children congregate under the conceptual accident potential zones. Additional analysis and information is provided in Section 4.3.2.4.

5.e. Lack of First Responders at Outlying Landing Field Coupeville

Public comments were received on concern for emergency service access at Outlying Landing Field (OLF) Coupeville. Section 3.10.3, Community Services, Affected Environment, describes how seven emergency services serve Whidbey Island. Naval Air Station (NAS) Whidbey Island Federal Fire Department serves NAS Whidbey Island, Navy Housing, the Seaplane Base, and OLF Coupeville. In accordance with Navy Instruction 3710 (series), a first responder unit is required to be present at OLF Coupeville during airfield operations, such as field carrier landing practice.

6. Air Quality

6.a. Air Quality Impacts from Mobile Source Emissions (Jet Engine and Vehicle)

As discussed in Section 4.4, air emissions from the Growler aircraft would increase as a result of the Proposed Action. The analysis evaluates the change in emissions that would be associated with this action. These emissions are dispersed over a large area, and air quality in the region is in attainment with all National Ambient Air Quality Standards. The majority of aircraft emissions are gaseous, not particulate emissions that would fall on nearby properties.

As discussed in Section 4.4, the majority of total emissions and the increase in mobile emissions would occur at Ault Field, occurring on or over the aircraft runways and taxiways, while the increased operations at Outlying Landing Field (OLF) Coupeville would result in a three-fold increase in emissions at the OLF under Scenario A (See Table 4.4-3). Field carrier landing practice at OLF Coupeville does not include many ground-level flight modes or frequent afterburner use. Therefore, the total emissions at OLF Coupeville are low compared to emissions at Ault Field. For example, the emissions of carbon monoxide and volatile organic compounds at OLF Coupeville are, respectively, 4 percent and 1 percent of total emissions of these pollutants and represent, respectively, 10 percent and 2 percent of the total change in emissions.

The change in vehicle emissions attributable to the increase in personnel associated with the Proposed Action has been included in the analysis. Refer to Section 4.4 and Appendix B for estimated emissions. This increase in emissions from vehicle operations represents a small percentage of the total change in emissions associated with the Proposed Action and a smaller percentage of total vehicle emissions within the region.

Refer to Sections 4.4 and 4.16 for a discussion of the Navy's commitments to reduce air emissions from both mobile and stationary sources.

6.b. National Ambient Air Quality Standards Compliance

As discussed in Section 4.4, air emissions would increase as a result of the Proposed Action. The analysis evaluates the change in emissions from construction, operations, and mobile sources that will be associated with the Proposed Action. The annual emissions quantified for this analysis are dispersed over a large area at two different sites (Outlying Landing Field Coupeville and Ault Field), and most emissions would occur at Ault Field. These emissions are not likely to cause exceedances of the National Ambient Air Quality Standards (NAAQS).

Air quality within the Northwest Clean Air Agency jurisdiction is considered good. In 2016, the Washington Department of Ecology submitted recommended designation information for the 2015 eight-hour ozone NAAQS (70 parts per billion [ppb]), noting that 2013-2015 ambient air data collected at Anacortes established a design value of 42 ppb, the lowest level in the state and significantly lower than the standard. (Bellon, 2016).

The Northwest Clean Air Agency is responsible for maintaining air quality and air quality monitoring in the region, including compliance with NAAQS. The Northwest Clean Air Agency has reviewed the air quality analysis of this Environmental Impact Statement and had no comments to provide to the Navy (Buford, 2017). Because emissions are dispersed over a large area and air quality in the region is in attainment with all NAAQS, the Navy has determined that the Proposed Action is not likely to have a significant impact on air quality in the region. The Northwest Clean Air Agency will continue to monitor ambient air emission levels to confirm continued compliance with NAAQS.

Refer to Sections 4.4 and 4.16 for a discussion of the Navy's commitments to reduce air emissions from mobile and stationary sources.

6.c. Hazardous Air Pollutant Compliance

As discussed in Section 3.4, Hazardous Air Pollutant (HAP) emissions from stationary sources are covered by the Naval Air Station Whidbey Island Air Operating Permit (AOP). Changes to HAP emissions from stationary sources and ground equipment and vehicles have been quantified, and would be negligible and covered by source-specific restrictions and requirements. New volatile organic compound emissions from the painting, solvent, and fueling operations would not trigger a required change to the AOP. HAP emissions from aircraft are a subset of the volatile organic compound totals quantified in Table 3.4-5.

6.d. Air Operating Permit

As discussed in Section 4.4, construction equipment should not require revisions to Naval Air Station (NAS) Whidbey Island's Air Operating Permit. However, final selection of construction equipment will include a review of permitting requirements, and changes to the Air Operating Permit would be made if required. New operating emissions are subject to NAS Whidbey Island's Air Operating Permit. However, because there should be no new permitted sources and emission increases would be below permit-revision requirement thresholds, any emission increases would not be likely to result in changes to the Air Operating Permit. Final selection of building systems will include a review of permitting requirements, and changes to the Air Operating Permit would be made if required.

6.e. Jet Engine Test Cells

As stated in Sections 3.4.2 and 4.4.2, Growler engines (F414-GE-400) are not currently tested using out-of-frame methods at Naval Air Station Whidbey Island test cell facilities, and there are no plans to do this as a part of the Proposed Action. Increases in in-frame testing have been included as mobile emissions in the analysis.

6.f. Fuel Dumping

Fuel dumping is a highly controlled activity and is addressed in this Environmental Impact Statement in Section 3.4.2. Per the NAS Whidbey Island Air Operations Manual, Navy pilots are prohibited from dumping fuel at altitudes below 8,000 feet above ground level, except in an emergency situation. Fuel dumping is the practice of releasing jet fuel from the aircraft's fuel tank(s) to reduce the weight of the aircraft in order to provide a safe landing weight.

6.g. Chaff

Chaff consists of tiny, light aluminum and glass fibers that, when released from aircraft, provide a cloud that disrupts targeting and missile guidance to defend the aircraft against attack. Pilots conduct training with chaff in authorized training ranges to familiarize themselves not only with its deployment strategy but also to train themselves in combat response to chaff use. As discussed in Section 3.4.2, Growler aircraft have the capability to deploy chaff. However, while chaff is used in combat training exercises, it is not used during airfield operations at either Ault Field or Outlying Landing Field Coupeville; therefore, its use is not affected by the Proposed Action.

7. Land Use

7.a. Regional Land Use and Community Character

For a discussion of regional land use and the impacts to it, please see Sections 3.5.2.2 and 4.5.2.1, respectively. The Environmental Impact Statement concludes there will be no impact to regional land use from the Proposed Action.

In addition, per suggestions by commenters, two new sections, Community Character, and Community Character Environmental Consequences, have been added within the land use sections of the analysis (Sections 3.5.2.3 and 4.5.2.1.2, respectively); these sections analyze the potential of the Proposed Action to change the locally defined community character.

7.b. Land Use Compatibility and Air Installations Compatible Use Zones

As stated in Section 3.5.2.2, Regional Land Use and Land Use Controls, noise zones, accident potential zones, and recommendations to promote community development compatible with air operations are defined as part of the Air Installations Compatible Use Zones process. Please see Table 3.5-1 for Air Installations Compatible Use Zones land use compatibility recommendations. For a discussion on land use compatibility, please see Sections 3.5.2.4 and 4.5.2.1. The Navy has encouraged Island County to establish Accident Potential Zones (APZs) around Outlying Landing Field (OLF) Coupeville and to establish land use controls and building standards appropriate for high noise areas. The establishment of Ebey's Landing National Historical Reserve (of which the Navy is one of the many land owners) as well as

the Navy's Readiness and Environmental Protection Integration program have helped to ensure compatible land use and development around OLF Coupeville.

7.c. Noise Disclosure

It is the responsibility of the local municipalities to elect to implement or adopt the recommendations of the Navy's Air Installations Compatible Use Zones program. The Air Installations Compatible Use Zones program does not regulate land uses off base. Local governments should be proactive in recognizing components of the Air Installations Compatible Use Zones footprints and regulating development around airfields by means of Air Installations Compatible Use Zones ordinance addendums to their overall zoning ordinances (i.e., noise disclosures and building codes). As stated in Section 3.5.2.2, Regional Land Use and Land Use Controls, Island County and the City of Oak Harbor have adopted noise disclosure ordinances whereby noise disclosure is the responsibility of the property owner and his or her agents. Neither Skagit County nor the Town of Coupeville has adopted a noise disclosure ordinance. Noise disclosure is the responsibility of the property owner and his or her agents.

7.d. Recreation and Wilderness Analysis and Study Area

The study area for recreation and wilderness areas includes areas near the Naval Air Station Whidbey Island complex within the affected environment noise contours out to the 65 decibel (dB) day-night average sound level (DNL) noise contour. Outside the greater than 65 dB DNL noise contours, all land uses are generally considered compatible with military aircraft operations according to Navy Air Installations Compatible Use Zones program guidance. Analysis and maps in Sections 3.5.2.5 and 4.5.2.2 focus on areas within the study area (the greater than 65 dB DNL noise contour). Figures may not depict all parks and recreational areas outside the study area. Datasets used to show parks and recreational areas on Figure 3.5-3 are identified in Section 3.5.2.5.

The location-based analysis of recreation in Sections 3.5.2.5 and 4.5.2.2 considers all types of outdoor recreation. In response to comments received on the Draft Environmental Impact Statement (EIS), the Navy re-conducted its analysis on outdoor recreation areas for the number of noise events above 50 dB per daytime hour instead of the 65 dB threshold utilized in the Draft EIS. The new analysis is presented in Sections 3.5.2.5 and 4.5.2.2.

The parks and recreation areas considered in the EIS have been expanded based on public comments received on the Draft EIS to include additional areas such as local schools, sports fields, public beach access areas and trails, and privately owned and commercial recreational facilities, based on input received during the public comment period. Additional qualitative analysis has been added to Section 4.5.2.2 to consider potential impacts on recreation outside of federal, state, and local parks and other designated recreational facilities, including recreation on private property and on publicly accessible land.

The introduction to Section 4.5.2.2 has been revised to cite additional studies evaluating the impacts of recurring, intrusive aircraft noise on the recreational experience and perceptions of scenic landscapes. The section notes that, although visitors are currently exposed to noise from existing aircraft operations, intrusive noise would be expected to impact people recreating in other areas outside of parks and designated recreational land, such as urban centers or rural areas.

In addition, Section 4.5.2.2 addresses the impacts of the Proposed Action on recreational use and management of the San Juan Islands National Monument as a result of noise from Growler operations.

7.e. Impacts to Recreation from Noise/Operations

The analysis of impacts to recreational and outdoor areas in Section 4.5.2.2 considers the projected increase in the rate of intrusive noise events over 50 decibels (dB) and projected changes in annual average noise exposure at parks and other recreational areas within the study area. The increase in the rate of intrusive noise events over 50 dB by alternative is also shown in Section 4.2. Use of the number of events above 50 dB supplemental noise metric provides a method for measuring how frequently intrusive noise may interrupt or interfere with outdoor activities. The frequency at which intrusive noise occurs influences the degree to which people experience annoyance as a result of the noise (i.e., the more frequently intrusive noise occurs, the more likely people are to experience annoyance). Therefore, assessing the frequency of intrusive noise events provides a more accurate means to gauge the potential for annoyance and a less abstract way for readers of the Environmental Impact Statement (EIS) to understand what the noise impact might be during a typical park visit of several hours, compared to assessing total annual operations or a total percentage increase.

The day-night average sound level (DNL) metric has been determined to be a reliable measure of long-term community annoyance with aircraft noise and has become the standard metric used by federal government agencies for assessing aircraft noise exposure, including the Federal Aviation Administration, U.S. Environmental Protection Agency, U. S. Department of Defense, Federal Interagency Committee on Noise, American National Standards Institute, and World Health Organization, among others. As DNL is the federal standard, many state and local governments, including Island County, have included DNL contours in their land-use planning and zoning ordinances.

Scientific studies have found a good correlation between the percentages of groups of people highly annoyed and the level of their average noise exposure measured in DNL. Please see Section 3.2.2.1 for additional discussion of the DNL metric. While use of the DNL metric to assess potential impacts to the recreational experiences does not capture the potential for annoyance during a relatively short (several hours or overnight) visit to a park or recreational area, it does provide a means to quantify and compare overall impacts resulting from average annual noise exposure at parks and recreational areas that were not included as points of interest in the noise analysis.

This Proposed Action does not include analysis of the transition from the Prowler to the Growler (see Section 1.6, Key Documents). This Proposed Action is the addition of new Growler aircraft that would operate at the Naval Air Station Whidbey Island complex as a result of Congressional action to increase the number of Growler aircraft. The transition from Prowler squadrons to Growler squadrons was completed in 2016. As a result, no Prowlers are home based at Ault Field, and Growler aircraft would continue to operate at the complex under No Action Alternative conditions. The Proposed Action would not result in changes in the type of noise experienced within the study area or the operating procedures, flight routes, or altitudes used by Growler aircraft.

7.f. Impacts to Wilderness Areas

The analysis in Section 4.5.2.2 has been revised to consider potential impacts of the Proposed Action on Williamson Rocks, an exposed bedrock formation in the San Juan Islands Wilderness that is within the study area. The analysis concludes that there would be no impacts to Bureau of Land Management-owned land with wilderness characteristics because none of these lands are within the study area. The analysis of wilderness areas in Sections 3.5.2.5 and 4.5.2.2 is based on the definition of wilderness in the Wilderness Act of 1964 and on the Bureau of Land Management definition of, and regulations pertaining

to, lands with wilderness characteristics because these are designations with special considerations for recreation. The impacts discussion in Section 4.5.2.2 addresses potential impacts for other recreational areas outside of designated parks and wilderness that are within the study area. Additionally, Section 4.8 addresses impacts to wildlife and ecosystems within the study area.

7.g. Ebey's Landing National Historical Reserve

The discussion of Ebey's Landing National Historical Reserve in Sections 3.5.2.5 and 4.5.2.2 has been expanded and revised:

i. Section 3.5.2.5 has been expanded to include discussions of the National Park Service's 2015 acoustical monitoring study, which measured noise produced by existing Growler operations, and National Park Service management policies for preserving soundscapes.

ii. Figure 3.5-3 has been revised to correct the label for Ebey's Landing National Historical Reserve and include a boundary line showing the extent of public and private lands within the reserve.

iii. The introduction to Section 4.5.2.2 has been revised to include additional studies assessing the impacts of intrusive noise on visitors' experience and enjoyment of parks and natural areas, including by detracting from visitors' perceptions of their experience and the "naturalness" of the area.

iv. Section 4.5.2.2 has been revised to include additional discussion of the rate of intrusive noise events and changes in sound exposure level and maximum A-weighted sound level visitors to the park are likely to experience on an average basis, impacts on various outdoor recreational activities and outdoor interpretive programs and social events at the reserve, impacts on ecosystems, and the potential for vibration to cause annoyance. (See Section 4.6.2.1 for additional discussion of potential vibration impacts on cultural resources.)

v. The discussion of potential impacts on recreation management at Ebey's Landing National Historical Reserve in Section 4.5.2.2 has been revised based on input received during public review of the Draft Environmental Impact Statement (EIS) and National Park Service policies for managing soundscapes.

The assessment of impacts on the recreational experience at the reserve is based primarily on the average number of intrusive noise events above 50 decibels (dB) and number of events with the maximum sound exposure level or maximum A-weighted sound level that would occur per daytime hour (7:00 a.m. to 10:00 p.m.) under each alternative. These supplemental metrics provide a method for measuring how frequently intrusive noise may interrupt or interfere with outdoor activities. The frequency at which intrusive noise occurs influences the degree to which people experience annoyance as a result of the noise (i.e., the more frequently intrusive noise occurs, the more likely people are to experience annoyance). Therefore, assessing the frequency of intrusive noise events provides a more accurate means to gauge the potential for annoyance and a less abstract way for readers to understand what the noise impact might be during a typical park visit of several hours, compared to assessing total annual operations or a total percentage increase.

7.h. San Juan Islands National Monument

Section 4.5.2.2 addresses the potential impacts of the Proposed Action on recreation within the San Juan Islands National Monument and surrounding water areas within the monument's conservation area boundary. The analysis considers impacts on the recreational experience in water areas within the

conservation area boundary that are within the study area. No Bureau of Land Management-owned lands in the San Juan Islands National Monument are within the study area.

Section 3.5.2.5 notes that the presidential proclamation designating the national monument does not restrict safe and efficient aircraft operations by the armed forces. Potential impacts on recreational use of the national monument are considered and discussed.

Sections 3.8 and 4.8 discuss wildlife and threatened and endangered species. The discussion focuses on potential impacts on specific classes and species of animals throughout their ranges in the study area, rather than focusing on specific designated areas such as the San Juan Islands National Monument.

7.i. Deception Pass State Park and Other State Parks

Additional information regarding trends in the number of visitors at Deception Pass State Park and other state parks in the study area (Fort Casey State Park and James Island Marine State Park) has been added to Section 3.5.2.5 and 3.10.2.2 (Tourism section). These sections have been revised to include information on existing impacts to camping resulting from current Growler operations.

Sections 4.5.2.2 and 4.10.2.2 have been expanded to include discussions of potential impacts to camping at parks in the study area as a result of the Proposed Action. Section 4.5.2.2 now includes analysis of the potential for campers to be affected (i.e., annoyed by) nighttime aircraft operations. This discussion is based on an expanded noise analysis that considers the number of nights Naval Air Station (NAS) Whidbey Island is expected to conduct field carrier landing practice under each alternative (see Section 4.2). The probability-of-awakening information presented in Sections 3.2 and 4.2 is based upon individuals sleeping indoors, and sleeping outdoors in a tent does not have the sound attenuation associated with a house. Therefore, considering the estimated total number of nights the NAS Whidbey Island complex is expected to conduct field carrier landing practice recognizes the higher probability of awakening for people sleeping in tents. Section 4.10.2.2 has been expanded to include a discussion of the impacts of the Proposed Action on tourism, including tourism at state parks. The discussion in Section 4.10.2.2 also considers potential impacts resulting from loss of camping revenue at state parks.

The introduction to Section 4.5.2.2 also has been revised to cite additional studies evaluating the impacts of recurring, intrusive aircraft noise on the recreational experience and perceptions of scenic landscapes. Section 4.5.2.2 includes an analysis of noise impacts on recreation at state parks in the study area based on the projected number of events above 50 decibels (dB) per daytime hour at most state parks in the study area. For James Island Marine State Park, which was not included as a point of interest in the noise analysis, the analysis is based on overall changes in the extent of the greater than 65 dB day-night average sound level noise contours under each alternative and scenario. Sections 3.2.2.5 and 3.2.3 provide an explanation of the supplemental metric used to assess outdoor speech interference.

7.j. Impacts on Outdoor Sports

Sections 3.5.2.5 and 4.5.2.2 have been revised to include analysis of outdoor recreation at additional schools within the Recreation and Wilderness defined study area and outdoor sports at parks and ball fields, including Rhododendron Park, Fort Casey State Park, and Clover Valley Ball Park. A discussion of the use of and need for hearing protection while playing outdoor sports has been added to Section 4.5.2.2.

8. Cultural Resources

8.a. Cultural Resources Area of Potential Effect

See Section 3.6.1.2 and Appendix C for additional information regarding the area of potential effect. The Navy determined an appropriate area of potential effect based on the scale and nature of the undertaking, consistent with the Section 106 implementing regulations (36 Code of Federal Regulations 800). The area of potential effect incorporates the geographic extent of an aggregate line created by combining the largest geographic expanse of the 65 decibel (dB) day-night average sound level (DNL) noise contours for each action alternative for the Naval Air Station Whidbey Island complex (Ault Field and Outlying Landing Field Coupeville) and is inclusive of Ebey's Landing National Historical Reserve. The Section 106 analysis is based on the maximum proposed change at both Ault Field and Outlying Landing Field Coupeville, so all alternatives and scenarios are covered through this analysis. Thus, all 15 alternatives and scenarios analyzed in the Final Environmental Impact Statement have similar indirect adverse effects to the perceptual qualities of the five representative landscape features. The language within the analysis was updated to show that this accounts for the largest area incorporated by the 65 dB DNL noise contour for all of the alternatives and the boundaries of Ebey's Landing National Historical Reserve.

With regard to the selection of the 65 dB DNL noise contour, this is an accepted practice among federal agencies and has been utilized within the context of previous studies of effects to historic properties proximate to airports. As shown in the consultation letters dated May 1, 2017, and June 25, 2018 (Appendix C), the Navy believes the 65 dB DNL noise contour focuses the analysis on those historic properties that routinely and repeatedly are exposed to high-decibel levels of noise, as opposed to those that may only occasionally be exposed to this level of noise. The use of this noise contour has been carried forward through the final analysis.

8.b. Section 106 Process

In complying with its Section 106 responsibilities, the Navy adheres to the procedures identified in the implementing regulations (36 Code of Federal Regulations Part 800). The responsibility for Section 106 compliance is the Navy's because it is the lead federal agency for the undertaking.

As shown in Section 3.6.1.1, the Navy has established procedures for addressing its responsibilities with regard to historic properties, including its efforts to consult with interested parties, which include the Advisory Council on Historic Preservation, State Historic Preservation Office, American Indian tribes and nations, local governments and agencies, and other organizations or individuals. The Navy's evaluation includes archaeological and architectural resources, cemeteries, and traditional cultural properties--particularly those that are historic properties (i.e., those listed or eligible for listing on the National Register of Historic Places).

Archaeological surveys for which State Historic Preservation Office concurrences have been received were conducted within Ault Field--the primary location of potential ground disturbance (Section 3.6.2.1). No additional surveys are necessary in this area.

For the review of architectural (above-ground) resources, the Navy has considered its responsibilities under Section 106 and has conducted its evaluation appropriate to the scale and type of undertaking. The Navy has considered historic properties that are located within the area of potential effect. An

evaluation of individual properties is provided as part of the Section 106 consultation documented in Appendix C.

In consideration of its Section 106 responsibilities, the Navy has determined that an adverse effect will occur as a result of the changes to the perceptual qualities of five landscape features that contribute to the significance of the Central Whidbey Island Historic District/Ebey's Landing National Historical Reserve. The Navy is continuing to consult with interested parties regarding the development of a Memorandum of Agreement.

8.c. Noise and Vibration Impacts to Cultural Resources

Potential impacts associated with noise and vibration (including low-frequency noise) are addressed as part of the Navy's Section 106 consultation (Appendix C). The Navy has evaluated potential impacts to individual buildings as part of this effort. The Navy also has evaluated potential impacts based on the types of buildings located within Ebey's Landing National Historical Reserve and surrounding areas that are located within the area of potential effect (see Section 3.6.1.2). Information also is provided in Section 4.6.2.1.2.2.3 regarding the potential for noise and vibration impacts. National Research Council guidelines for evaluating potential impacts from noise state that sounds lasting more than 1 second with a peak unweighted sound level greater than or equal to 130 decibel (dB) are considered potentially damaging to structural components. A study conducted in 2012 at Naval Air Station Whidbey Island found that the Growler would exhibit C-weighted sound levels (dBC) up to 101 dBC when cruising and 109 dBC (gear down) at approach. In 2016, the NPS conducted an acoustical study at two properties within Ebey's Landing National Historical Reserve. When comparing the highest recorded sound pressures of 113 dBA and 85 dBA at Reuble Farmstead and Ferry House, and conservatively converting these A-weighted measurements to C-weighted measurements (i.e. addition of 6 dB), it is unlikely that sound pressures of 119 dBC and 91 dBC would approach a sound level greater than or equal to 130 dBC. As these levels are less than the 130 dB criterion, damage would not be expected for typical residential structures in the vicinity of Naval Air Station Whidbey Island (see Section 4.6.2.1.2.2.3, Noise and Vibration, for more details). Additional information regarding individual buildings is provided in Appendix C.

8.d. Island County Cultural Resources

As part of the analysis, consideration is made for cultural resources located within the area of potential effect (see Section 3.6.1.2). The area of potential effect includes portions of Island County and thereby provides for consideration of the history of the county and the material evidence (e.g., archaeological sites and architectural resources) associated with it. Additional information has been included in Sections 3.6 and 4.6 to more clearly demonstrate the geographic area considered within the analysis and the potential for effects to resources located within the area of potential effect.

8.e. Outlying Landing Field Coupeville and Coupeville History

Section 3.6.2 contains information on the history of Outlying Landing Field (OLF) Coupeville and Coupeville itself. Information within Section 3.6.2 shows that the northern portion of OLF Coupeville is located within Ebey's Landing National Historical Reserve and that Coupeville is the second-oldest town in Washington. The Navy is respectful of the history prior to the current OLF Coupeville military usage and has considered how the construction and operations associated with the three alternatives would impact historic structures, particularly those dating to the nineteenth century. The scenarios analyzed

under each of the three alternatives provide clarity on how various resources are affected both positively and negatively by the scenarios.

The Navy has encouraged Island County to establish Accident Potential Zones (APZs) around OLF Coupeville and to establish land use controls and building standards appropriate for high-noise areas. The establishment of Ebey's Landing National Historical Reserve (of which the Navy is one of the many landowners), as well as the Navy's Readiness and Environmental Protection Integration (REPI) program, have helped to ensure compatible land use and development around OLF Coupeville. Through the REPI program, Naval Air Station (NAS) Whidbey Island has been able to protect land uses under the primary flight corridors at both airfields within the NAS Whidbey Island complex. As of January 2018, the Navy has invested $13.8 million in direct payments to landowners willing to maintain compatible uses within the flight corridors. These easements protect local farms and endangered species, as well as prevent incompatible uses within the most heavily used air space. Through this program, NAS Whidbey Island has protected 1,505 acres of open space and working farms, and has helped preserve the rural character of Ebey's Landing National Historical Reserve (NAS Whidbey Island, 2018).

8.f. Cultural Landscape and Impacts to Ebey's Landing National Historical Reserve

Ebey's Landing National Historical Reserve is a unique unit of the National Park System because of the private and public ownership (including the Navy) of the resources within it. As part of the analysis, the Navy has recognized the importance of the settlement patterns; the presence of pastoral farmsteads, commercial buildings, and other historic buildings; the importance of American Indian tribes' and nations' history; and considerations for the attachment that people feel to the historic property.

As stated in Section 3.6 and in Appendix C, the Navy has considered the potential to affect historic properties through its Section 106 responsibilities and under the National Environmental Policy Act. Consideration is provided for those resources located within the area of potential effect. Direct impacts or effects (i.e., physical changes) were evaluated only in portions of the area of potential effect that would be subject to ground disturbance (i.e., the on-installation direct effect area); indirect impacts or effects (e.g., visual, atmospheric, and auditory) were evaluated throughout the entire area of potential effect. Please see the consultation letters dated May 1, 2017, and June 25, 2018, in Appendix C for additional information.

The following provides a discussion of how Ebey's Landing National Historical Reserve was evaluated with regard to cultural resources under both Section 106 and the National Environmental Policy Act:

Under Section 106, the Navy considers whether there is potential to affect those qualities (i.e., the aspects of integrity) that convey the significance of a historic property. Ebey's Landing National Historical Reserve/Central Whidbey Island Historic District are historic properties. They are listed under Criteria A (associated with events), B (associated with the lives of significant persons), and C (embody distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant and distinguishable entity). In this regard, seven aspects of integrity are evaluated: location, design, setting, feeling, association, workmanship, and materials. The location, design, association, workmanship, and materials are not affected because no physical changes occur as a result of the Proposed Action under each of the three alternatives. As shown in the analysis, the Navy, therefore, included an evaluation of how the alternatives would affect setting and the potential for visual, atmospheric, or auditory effects. Feeling was considered to the extent possible, as it is an intangible that could be different for each person experiencing the property.

Under Section 106, the Navy determined a finding of adverse effect to historic properties. As shown in Table 4.6-1, an adverse effect is "found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, setting, design, materials, workmanship, feeling, or association" (36 Code of Federal Regulations 800.5[a][1]). To retain historic integrity, a historic property generally will possess several, or most, of these aspects.

When considering a historic district, such as Ebey's Landing National Historical Reserve, consideration also is needed for the relative number, size, scale, design, and locations of components that both do and do not contribute to its significance. In this regard, the relationships between components must be substantially unchanged to retain integrity.

The Navy has shown that while the setting may be temporarily interrupted by the visual presence of aircraft (during takeoffs and landings, and while in flight), these occurrences do not detract from the relationships of components within the district and do not interfere with the overall integrity of the district. However, the Navy has determined that the increased frequency of noise exposure results in adverse indirect effects to characteristics of the Central Whidbey Island Historic District that currently make it eligible for the National Register of Historic Places. Although the effects are intermittent, the proposed undertaking would result in an increased occurrence of noise exposure affecting certain cultural landscape components in the historic district—specifically, the perceptual qualities of five locations that contribute to the significance of the landscapes within Ebey's Landing National Historical Reserve. The Navy finds no other adverse effects to historic properties from the proposed undertaking. The Navy is continuing to consult with interested parties under Section 106.

Visual, atmospheric, and auditory impacts to Ebey's Landing National Historical Reserve also were evaluated under the National Environmental Policy Act. These impacts were evaluated as to the temporal extent of the impacts (e.g., temporary or permanent) and their intensity (e.g., minimal to significant). Similar to the evaluation under Section 106, impacts will occur. However, they generally will be temporary in nature and would vary depending on the distance from the aircraft and the actual visibility. For this reason, the Navy anticipates that the level of impact will vary from minimal to moderate--reflecting these differences. Findings made as part of the Section 106 consultation are incorporated into the Navy's evaluation of cultural resources under the National Environmental Policy Act.

The Department of Defense's Readiness and Environmental Protection Integration (REPI) program is a key tool for combating the airfield encroachment that can limit or restrict military training, testing, and operations. The REPI program protects these military missions by helping remove or avoid land-use conflicts near installations and addressing regulatory restrictions that inhibit military activities. The REPI program is administered by the Office of the Secretary of Defense (OSD).

A key component of the REPI program is the use of buffer partnerships among the military services, private conservation groups, and state and local governments, authorized by 10 United States Code, Section 2684a. These partnerships share the cost of acquisition of easements or other interests in land from willing sellers to preserve compatible land uses and natural habitats near military facilities that help sustain critical military mission capabilities that are at-risk from external encroachment pressures (DoD, 2017).

Through the REPI program, Naval Air Station (NAS) Whidbey Island has been able to protect land uses under the primary flight corridors at both airfields within the NAS Whidbey Island complex. As of

January 2018, the Navy had invested $13.8 million in direct payments to landowners willing to maintain compatible uses within the flight corridors. These easements protect local farms and endangered species, as well as prevent incompatible uses within the most heavily used air space. Through this program, NAS Whidbey Island has protected 1,505 acres of open space and working farms, and has helped to preserve the rural character of Ebey's Landing National Historical Reserve (NAS Whidbey Island, 2018).

The Conservation Futures Funds program is operated by Island County to preserve and protect valuable and sensitive lands for future generations. Island County Commissioners have the ability to establish specific goals for awarding these local grant contributions. In the most recent cycle, lands that also protected NAS Whidbey Island were awarded extra points as the local priority for grant awards. NAS Whidbey Island has many partners in easement acquisitions around the NAS Whidbey Island complex, and the Conservation Futures Funds are often the source of local matching funds for the REPI easement acquisitions (NAS Whidbey Island, 2018).

8.g. Mapping and Location of Ebey's Landing National Historical Reserve and Central Whidbey Island Historic District

The maps throughout the analysis have been updated to account for the boundary of the Ebey's Landing National Historical Reserve. The boundaries as shown are the same as the Central Whidbey Island Historic District. Text in Section 3.6.2 has been updated to show these share the same boundaries. Ebey's Landing National Historical Reserve has also been added to the acronym list.

8.h. Ebey's Landing National Historical Reserve, Military Association

The Navy has considered the historic themes associated with the listing of the Central Whidbey Island Historic District and the Ebey's Landing National Historical Reserve on the National Register of Historic Places.

As discussed in Section 4.6.2, the consistent presence of the military within the reserve was one of these considerations in the evaluation of potential impacts; the text has been updated to more clearly show that the military presence is one of the many considerations in the evaluation of effect. The Navy does recognize the different types of use associated with modern-day operations. Therefore, as part of its Section 106 consultation (Appendix C), the Navy is considering the impacts associated with the operation of Growler aircraft on individual categories of historic buildings.

In its May 1, 2017, consultation letter (Appendix C), the Navy also has provided information regarding its previous environmental documentation for the arrival of the Growler aircraft and flight operations from the 1970s. In this letter, the Navy shows that the flight operations are anticipated to return to the historical levels from the 1970s, 1980s, and 1990s. The Navy also indicated that it will reconsider the defined area of potential effect if the identification of historic properties, determination of eligibility, or assessment of adverse effects reveals properties with significant historic features affected by sound levels.

8.i. Deception Pass Cultural Resources

See Section 3.6.1.2 for a discussion of the area of potential effect. The area of potential effect defines the geographic extent of the analysis of cultural resources. The Deception Pass State Park and Deception Pass Bridge are located within the area of potential effect. These resources are considered in the

evaluation conducted by the Navy to meet its Section 106 and National Environmental Policy Act responsibilities.

8.j. City of Port Townsend Cultural Resources

Please see Section 3.6.1.2 for a discussion of the area of potential effect. Port Townsend is located outside of the area of potential effect (i.e., the geographic area used for the evaluation of cultural resources). As such, an evaluation of potential effects to historic properties and other cultural resources was not completed for this area. However, the City of Port Townsend was invited to consult for Section 106 via letter on July 12, 2016. This letter is located in Appendix C (addressed to Mayor Stinson, City of Port Townsend). The Navy has continued to provide information regarding its efforts to consult with this community since this initial letter. Additional information is provided in Section 3.6.2.6 regarding consultation information post-dating the release of the draft analysis. Clarifying text also was included in Section 3.6.2.6 to show the initial list of consulting parties and the later additions.

9. American Indian Traditional Resources

9.a. Consideration of Tribes

As part of its government-to-government consultation responsibilities, the Navy has initiated consultation with eight American Indian tribes and nations; a list is provided as part of Sections 3.6.2.4 and 4.6. The American Indian tribes and nations are those with reservations located within or in proximity to the area of potential effect (see Section 3.6.1.2) and/or that have an interest in the geographic area as a result of traditional use areas, cultural ties, or historic settlement.

From the eight American Indian tribes and nations consulted, three responses were received. The first, from the Samish Indian Nation, indicated that the tribe was not interested in consulting with the Navy regarding this action. The second, from the Jamestown S'Klallam Tribe, indicated that with respect to cultural resources, the tribe had no comments regarding the Growler flight operations. The tribe requested future consultation on projects regarding renovation, demolition, and construction of facilities at Naval Air Station Whidbey Island. The third, from the Swinomish tribe, requested government-to-government consultation with the Navy; however, the tribe subsequently withdrew its request on September 27, 2017. No other tribes have requested or initiated government-to-government consultation. The Navy has continued to provide information to the tribes and has requested their input regarding the potential to impact resources important to them (Appendix C).

9.b. Native Food Resources and Tribal Fishing Grounds

The Navy is consulting with American Indian tribes and nations as part of its government-to-government responsibilities. One of the Navy's responsibilities is to ensure that tribal members have access to their usual and accustomed grounds (i.e., treaty lands and/or waters). The approach to this evaluation is included in Section 4.7.1. To date, none of the American Indian tribes and nations has indicated a concern for potential impacts to traditional plant or animal resources as a result of the Proposed Action. As described in detail in Sections 3.7 and 4.7, the Proposed Action will not alter or prevent access to protected tribal resources, including hunting and fishing grounds. Therefore, the Proposed Action is not expected to disproportionately impact indigenous populations.

10. Biological Resources

10.a. Biological Resources Study Area

As described in Section 3.8.2, the biological resources study area is defined as all areas where modeled average noise levels under the Proposed Action would be equal to or greater than 60 decibels (dB) at ground/surface level and all areas where aircraft operations would occur at or below an altitude of 3,500 feet (see Figure 3.8-1). The Navy based the biological resources study area on the best available science, which indicates that some animals begin to respond to aircraft noise at as little as 60 dB and that most wildlife-aircraft collisions occur below an altitude of 3,500 feet (Black et al., 1984; Dolbeer et al., 2014). The biological resources study area includes portions of Whidbey Island, Fidalgo Island, Camano Island, mainland Skagit County, Skagit Bay, Salish Sea, Saratoga Pass, Rosario Strait, and Admiralty Inlet. The biological resources study area also overlaps with all or portions of the San Juan Islands National Wildlife Refuge (i.e., Bird Rocks, Williamson Rocks, Smith Island, and Minor Island); Deception Pass State Park; Dugualla State Park; San Juan Islands National Monument (i.e., Reservation Bay Rocks); Fort Casey State Park; Ebey's Landing National Historical Reserve; the Pacific Northwest National Scenic Trail; and a number of Important Bird Areas (IBA), such as Penn Cove IBA and Deception Pass IBA. Refer to Section 1.11 for a discussion of any areas that do not lie within the biological resources study area, including but not limited to the Strait of San Juan de Fuca and Olympic Peninsula (i.e., Port Townsend, Olympic National Forest, and Olympic National Park).

10.b. Biological Resources Impacts

Section 4.8 addresses direct and indirect impacts from construction of proposed new facilities and aircraft operations on resources within the study area. Special-status species, such as federally threatened and endangered species and bald eagles protected by the Bald and Golden Eagle Protection Act, are included in the analysis. General impact types include habitat loss, sensory disturbances, and aircraft-wildlife collisions. The analysis addresses cumulative impacts on biological resources, including wildlife, in Section 5.4.8. The biological resources analysis relies on best available science, citing more than 100 references, some of which were published as recently as 2017.

The Navy's Integrated Natural Resources Management Plan outlines actions and training for military personnel in order to protect natural resources, including nesting bald eagles.

10.c. Wildlife Sensory Disturbance and Habituation

The Draft Environmental Impact Statement analysis addressed sensory disturbance impacts on wildlife using existing research focused primarily on aircraft-related effects. The sensory disturbance discussion has been expanded to include the most recent aircraft noise science and additional research related to other human-made noise impacts on wildlife, including studies recommended during the public comment period. The Navy prepared its analysis on biological resources using the best available science, citing studies as recent as 2017. Section 4.8.2.1.2, Sensory Disturbance, and Section 4.8.2.2, Effects on Marine Species, provide information on sensory disturbance to terrestrial and marine wildlife. These sections focus on research related to aircraft noise or noise that is similar to aircraft noise, when available. In particular, the additional information bolsters discussions of behavioral and physiological responses to disturbances and increases the evaluations of potential fitness and population- and community-level impacts, where possible, for all bird (including marbled murrelets and bald eagles),

mammal, and reptile/amphibian species groups. Furthermore, the Navy has edited the information to improve clarity and resolve concerns regarding perceived unsubstantiated statements.

Discussion related to wildlife habituation has been clarified with expanded information (for birds, mammals, and reptiles/amphibians). The new content in Section 4.8 still notes that high levels of aircraft operations and other human-made disturbances have been present for decades but acknowledges that the Proposed Action may result in additional impacts. The updated information also identifies how, under Alternative 1, carrier capabilities would be expanded, resulting in a net increase of 35 aircraft. Under Alternative 2, expeditionary and carrier capabilities would be expanded, resulting in a net increase of 36 aircraft. Under Alternative 3, expeditionary and carrier capabilities would be expanded, resulting in a net increase of 36 aircraft similar to Alternative 2, but Alternative 3 would have slightly fewer aircraft operations than Alternative 2. New construction under Alternatives 1 through 3 would include expanded hangar space and/or new hangars, armament storage, maintenance facilities, and expanded personnel parking areas. Each alternative would result in creation of up to 2.3 acres of new impervious surface at Naval Air Station Whidbey Island. Impacts to biological resources would be similar under all three alternatives.

Section 3.8.2 details the specific biological resources (i.e., habitat and species) present on and around Ault Field and Outlying Landing Airfield (OLF) Coupeville. The biological resources present are generally similar at both locations. Species at or near Ault Field and OLF Coupeville would be impacted to greater or lesser extents depending on which scenario is selected within a given alternative.

10.d. Construction Impacts on Wildlife

The Proposed Action's new facilities would be constructed within areas composed entirely of existing structures, impervious surfaces, and landscaped (i.e., mowed) areas. The wildlife using the construction site, and thus most likely to be impacted, would be those species that are adapted to areas of extremely high levels of human activity. The analysis provides one parenthetical example (the raccoon) of a species that is modified to urban or human-modified environments but does not imply that raccoons would be more impacted than other wildlife.

10.e. A-Weighted Noise Analysis and Scale of Hearing on Wildlife

The noise analysis uses an A-weighted scale to present noise impacts associated with the Proposed Action. These results were not the only tool by which the Navy reached conclusions about sensory disturbance impacts on biological resources. The Navy largely uses A-weighted noise contours to determine potential areas of impact (i.e., biological resources study area) for the Proposed Action. The analysis relies on peer-reviewed literature pertaining to fish and wildlife responses to similar types of anthropogenic noise disturbances, primarily aircraft noise, to determine the potential impacts and their severity.

10.f. Endangered Species Impact Analysis Adequacy

The Navy initiated section 7 Endangered Species Act consultations with the United States Fish and Wildlife Service and the National Marine Fisheries Service in April 2017. Information pertaining to consultation on the marbled murrelet is provided in Section 4.8.2.1.2.2.1.1 for impacts from aircraft operations and Section 4.8.2.1.3.2.1.1 for impacts from aircraft-bird strikes. Analyses and conclusions of the potential effects to Endangered Species Act-listed fish are provided in Section 4.8.2.2.1.1. Analyses

and conclusions of the potential effects to listed whales are provided in Section 4.8.2.1.1 for effects from construction and Section 4.8.2.2.2.2.2.1 for effects from aircraft operations. A summary of all conclusions and consultation determinations is provided in Section 4.8.3, Biological Resources Conclusions.

10.g. eBird Data

eBird is a reputable source of bird abundance and distribution data, launched by the Cornell Lab of Ornithology and the National Audubon Society in 2002. eBird has become the largest repository of bird occurrence data in the world, amassing hundreds of millions of observations since its inception. eBird gathers data through citizen science efforts, just like other reputable bird data projects, including the North American Breeding Bird Survey, Christmas Bird Count, Puget Sound Seabird Survey, and Guillemot Research Group. Every record submitted to eBird goes through a data verification process that uses a combination of automated data filters and a network of local experts. The data quality is such that researchers, scientists, and conservationists regularly use eBird for their projects. In fact, authors have published more than 100 peer-reviewed journal articles in recent years about studies that incorporate eBird data.

Callaghan and Gawlik (2015) found that, when accounting for effort, there was no significant difference between eBird data and standardized surveys of shorebirds. The authors suggest that eBird data, where available, could substitute for standardized surveys and posited that eBird may be a more valuable tool for land managers and conservationists than currently realized. The wealth and quality of eBird data in the biological resources study area make it a critical source for this Environmental Impact Statement (EIS) in describing the species that may occur, their relative abundance, and their spatio-temporal distribution. This EIS also uses Seattle Audubon Society data, the Naval Air Station Whidbey Island Integrated Natural Resources Management Plan, and other sources to develop the birds, affected environment, discussion in Section 3.8. Refer to seabird sensory disturbance impacts in Section 4.8.2.1.2.2.1 for reference to pigeon guillemot research conducted by the Guillemot Research Group.

10.h. Species-Specific Discussions

Upon request from governmental agencies, non-governmental organizations, and/or the general public, the Navy updated its analysis in Section 4.8 with scientific literature for additional species, as appropriate. However, the Navy presents its impact conclusions for the species groups as a whole, and not for individual species, with the exception of federally protected species (e.g., those protected under the Endangered Species Act or Bald and Golden Eagle Protection Act). The analysis has also been updated to reflect communications between the Navy and the Washington Department of Fish and Wildlife.

10.i. Additional Special Status Species

The analysis addresses wildlife federally protected under the Endangered Species Act, Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and Marine Mammal Protection Act. In addition, the analysis cites literature that is related to state candidate, sensitive, threatened, and endangered species and county-designated special status species. “Priority Habitats and Species” and “Species of Greatest Conservation Need” are not explicitly addressed.

10.j. Plants

Sections 3.8.2.1 and 3.8.2.2 include an assessment of special-status plants that have the potential to occur within the biological resources survey area. The only area where vegetation will be impacted is within the proposed construction area at Ault Field. The Navy regularly maintains vegetation, including managing noxious weeds and invasive plants, as part of its Integrated Natural Resources Management Plan (see also the plan's Environmental Assessment). No unique or regionally significant vegetation communities occur in these areas, and all areas are previously disturbed. As stated in Section 3.8.2.2.1.1, the golden paintbrush occurs within the study area, but no suitable habitat exists for it within the proposed construction areas, so there would be no impact to the species.

10.k. Aircraft-Wildlife Strike and Hazing/Lethal Control of Wildlife

The analysis discusses aircraft strike impacts, including both in-air and on-ground strikes, on terrestrial wildlife in Section 4.8.2.1.3, Bird/Animal Aircraft Strike Hazard (BASH). Section 3.3 and Section 4.8 of the analysis reference Naval Air Station (NAS) Whidbey Island's BASH plan, and interested parties can review the installation's Integrated Natural Resources Management Plan or the associated Environmental Assessment for complete details. Section 4.8.2.1.3 of the analysis states that NAS Whidbey Island would continue to implement the measures outlined in the installation's BASH plan to minimize the risk of a strike occurring. Therefore, it is expected that the number of bird-aircraft strikes at the NAS Whidbey Island complex would remain relatively low compared to the high number of operations. In this context, the loss of several or even dozens of birds from physical strikes may not constitute a population-level impact for abundant species, and, therefore, aircraft strikes would not have significant impacts on local bird populations.

Public comments on the Draft Environmental Impact Statement were received regarding the inclusion of swans in the airstrike analysis. The NAS Whidbey Island complex reported fewer than 10 individual aircraft strikes of waterfowl between 2005 and 2017, most of which were limited to ducks. There are no reports of swans or geese having been struck during that period. Furthermore, the numbers of strikes reported during the winter months, when swans are present in the study area, are substantially less than during other times of the year (refer to Section 4.8.2.1.3, BASH). In addition to impacts on local wildlife populations, aircraft strikes with large-bodied birds endanger Navy personnel and the public, and result in financial losses from damaged aircraft (refer to Section 3.3.1.2). As such, the Navy is vigilant in preventing such incidents and abides by a BASH plan, which is available in the installation's Integrated Natural Resources Management Plan or the associated Environmental Assessment. The Navy does not address tundra and trumpeter swans specifically in this analysis, given the lack of documented swan-aircraft strikes and the measures the installation implements to prevent strikes with large-bodied birds. Furthermore, the Navy does not plan to alter wildlife management activities in association with the Proposed Action. As described in Section 3.3.2.2, the Navy secures the appropriate permits from the United States Fish and Wildlife Service and has staff members from United States Department of Agriculture Wildlife Services perform the work to ensure permit compliance.

Concerning impacts related to hazing/lethal control of wildlife, the addition of new aircraft associated with the Proposed Action does not alter the wildlife management activities at the NAS Whidbey Island complex. As such, hazing and lethal control of wildlife near the runways would not result in an increase in wildlife mortalities associated with the Proposed Action. Refer to the installation's Integrated Natural

Resources Management Plan or the associated Environmental Assessment for the complete BASH plan for details.

10.l. Bird Migration

The Environmental Impact Statement discusses bird migration in the biological resources study area in Section 3.8.2.2, under subsections titled Migratory Birds, Birds of Conservation Concern, Important Bird Areas, and Bald and Golden Eagles, as well as in Section 4.8.2.1, where appropriate. For military readiness activities, including aircraft operations, U. S. Department of Defense installations are exempt from "take" of migratory birds, unless the activities may result in a significant adverse effect at the population level. The Proposed Action's increase in aircraft operations would not have a significant impact on The Migratory Bird Treaty Act-protected species at the population level. During construction, impacts on The Migratory Bird Treaty Act-protected species would be largely avoided and minimized and, therefore, would not rise to the level of "take."

10.m. Impacts to Marine Species and Habitat

Discussion of existing marine species is included in Section 3.8.2.3. Marine species analyzed include 12 species of marine mammals, including both cetaceans (whales and dolphins) and pinnipeds (seals and sea lions), and 17 groups of fish encompassing numerous marine fish species.

Discussion of impacts from project-related activities, including construction and Growler operations, is included in the analysis in Section 4.8.2.2. This discussion has been expanded to include additional peer-reviewed literature recommended during the public comment period and other identified recent peer-reviewed literature. Additional details have been added regarding details from the consultation process between the Navy and the National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS).

The Proposed Action's increase in aircraft operations would not have significant noise and/or visual impacts on the Southern Resident killer whale and Mexico and Central America Distinct Population Segments of the humpback whale. Marine mammals, including non-Endangered Species Act (ESA) species, exposed to fixed-wing aircraft overflights could exhibit a short-term behavioral response, but fixed-wing aircraft overflights over territorial waters would have no significant impact on marine mammals In ESA terms, the Proposed Action may affect, but is not likely to adversely affect, the Southern Resident killer whale and Mexico and Central America Distinct Population Segments of the humpback whale. The Navy has consulted with the NMFS regarding the effects determination for these species under the ESA. Through consultation, the NMFS additionally determined that the construction activities may affect, but not adversely affect, Southern Resident killer whale critical habitat. Consultation documentation is included in Appendix C. Pursuant to the Marine Mammal Protection Act, the Proposed Action would not result in the unintentional taking (e.g., harassment) of marine mammals.

The Proposed Action's increase in aircraft operations would not have significant noise impacts on federally listed fish species (i.e., bull trout, green sturgeon, eulachon, Chinook salmon, Hood Canal summer-run chum, steelhead, bocaccio rockfish, and yelloweye rockfish). Therefore, the Proposed Action would not significantly impact the bull trout, green sturgeon, eulachon, Chinook salmon, Hood Canal summer-run chum, steelhead, bocaccio rockfish, and yelloweye rockfish. In ESA terms, the Proposed Action may affect, but is not likely to adversely affect, the Southern Distinct Population Segment green sturgeon, Southern Distinct Population Segment eulachon, Puget Sound Evolutionarily

Significant Unit Chinook salmon, Hood Canal summer-run chum, Puget Sound Distinct Population Segment steelhead, Puget Sound/Georgia Basin Distinct Population Segment bocaccio rockfish, Puget Sound/Georgia Basin Distinct Population Segment yelloweye rockfish, and bull trout. The Navy has consulted with the NMFS and USFWS under the ESA. Consultation documentation is included in Appendix C.

The Proposed Action would not directly impact marine habitats (see Section 4.9, Water Resources). Impact discussion related to air quality and emissions is located in Section 4.4, Air Quality; only limited emissions reach the ground or water. Discussion of shellfish species and their importance for human uses is included in Section 3.6.2, Cultural Resources, Affected Environment. Potential impacts to shellfish as a result of climate change are discussed in Section 4.16.1.1, Projections for Impacts of Climate Change to Washington and Puget Sound.

Non-project-related activities, such as sonar operation and underwater testing, are not considered or analyzed under this Proposed Action because they will not occur as part of it. Potential impacts on marine species from the Navy on these types of activities are covered under separate environmental studies.

10.n. San Juan Islands National Wildlife Refuge

Discussion of the San Juan Islands National Wildlife Refuge is included in Section 3.5.2.5, Recreation and Wilderness. Potential impacts are discussed in Section 4.5.2.2.2, Parks and Recreation Areas, Potential Noise Impacts. Given the increase in annual average noise exposure at Williamson Rocks and Bird Rocks, the Proposed Action would have moderate impacts on the San Juan Islands National Wildlife Refuge under all alternatives. Impacts to wildlife, including wildlife in the San Juan National Monument, are addressed in Section 4.8. No significant impacts are anticipated.

11. Water Resources

11.a. Groundwater

New construction under each of the alternatives would not impact Whidbey Island's three groundwater aquifers or any private wells in the vicinity of the Naval Air Station (NAS) Whidbey Island complex. None of the proposed construction would extend below the ground surface to a depth that would impact the underlying water tables. Although fuel or other chemicals could be spilled during construction, implementation of best management practices (e.g., immediate cleanup of spills) would prevent infiltration into the underlying groundwater. While the number of personnel employed or stationed at NAS Whidbey Island would increase under all alternatives, any effects to the drinking water supply would be minimal. NAS Whidbey Island does not use groundwater as a source of drinking water. For more information on this topic, see Sections 3.9 and 4.9, Water Resources, and Sections 3.15 and 4.15, Hazardous Materials.

11.b. Floodplains and Wetlands

No construction would occur within Federal Emergency Management Agency-mapped floodplains under any of the three alternatives. Therefore, there would be no impacts on floodplains. All three alternatives would be fully consistent with Executive Order 11988. Storm-related flooding at Ault Field and Seaplane Base has only been an issue related to high tide and high-wind events. The final installation

development plan recommends use of green infrastructure outside of the airfield and runways and use of low-impact design practices in construction projects. These practices would minimize potential impacts from storm-related and tidal flooding occurring with the new construction associated with the Proposed Action. No substantive comments were received with respect to the wetland analysis. For more information, see Sections 3.9 and 4.9, Water Resources.

11.c. Marine Waters and Sediment

The projected increase in new impervious surface under each action alternative would increase the quantity and velocity of stormwater runoff. This would increase the susceptibility of marine water and sediment to impacts such as increased turbidity and elevated pollutant levels. These impacts would be minimized or avoided by following Naval Air Station Whidbey Island's Stormwater Pollution Prevention and Control Plan, as well as implementing best management practices described in Section 4.9.2.1.2, Surface Water. This analysis includes impacts to surface water bodies such as Puget Sound, the Salish Sea, and Admiralty Inlet. For more information, see Sections 3.9 and 4.9, Water Resources.

11.d. Per- and Polyfluoroalkyl Substances

The Navy is committed to ensuring all individuals who live or work on or in the direct vicinity of Navy installations and facilities are protected from environmental contaminants and receive safe drinking water. Therefore, the Navy maintains comprehensive environmental instructions detailing procedures to meet requirements found in statute, regulation, and policy, including for hazardous materials such as per- and polyfluoroalkyl substances (PFAS). All legacy perfluorooctanesulfonate (PFOS)- and perfluorooctanoic acid (PFOA)-containing Aqueous Film-Forming Foam (AFFF) is actively being identified for removal and destruction. Areas surrounding Ault Field, the Area 6 Former Landfill, and Outlying Landing Field Coupeville are receiving drinking water testing to ensure the U.S. Environmental Protection Agency (USEPA) drinking water lifetime health advisory is met for PFOS and PFOA. In situations where USEPA lifetime health advisory levels have been exceeded, the Navy has provided alternative drinking water. The Navy is also taking action to reduce potential releases of these compounds into the environment. Consistent with Navy policy, these include ceasing uncontrolled environmental release of AFFF for shoreside installations (with the exception of emergency response), ceasing training with AFFF, testing firefighting and crash response vehicle AFFF systems, and testing to ensure hangar AFFF and other fixed systems have appropriate controls in place to prevent environmental release. The Navy is identifying for removal and destruction all legacy 3M® PFOS-containing and PFOA-containing AFFF. The Navy is testing current AFFF (most of which was developed to comply with the USEPA 2010/2015 PFOA Stewardship Program) to confirm chemical formulations, with the goal of identifying suitable replacements for existing stocks.

Therefore, implementation of any of the alternatives would not result in significant impacts to PFAS. For more information on this topic, see Sections 3.9 and 4.9, Water Resources. Some commenters have suggested that the Proposed Action would aggravate the use of PFAS. This is not the case because, as noted, the Navy is committed to preventing the further release of any PFAS chemical into the environment, regardless of the number of aircraft at Naval Air Station Whidbey Island.

12. Socioeconomics

12.a. Socioeconomic Study Area

Sections 3.10 and 4.10 discuss economic conditions in Island and Skagit Counties because it was determined these communities would likely be the most affected by the Proposed Action. Population, Table 3.10-2, provides a geographic distribution of place of residence for existing Navy personnel. As discussed in Chapter 4, it is assumed new Navy households will follow a similar distribution.

As described in Sections 3.10.2 and 4.10.2, the economic data utilized in the analysis are the best available data available at the time of writing. Information detailed in Section 3.10.2 that shows the current economic impact for the Naval Air Station Whidbey Island complex is from 2010 and 2013. The economic model used to forecast the expected direct, indirect, and induced impacts from the Proposed Action utilizes 2007 benchmark data for the entire United States and 2013 regional data.

12.b. Invisible Costs

In keeping with the Navy's commitment to utilize best available science and data, Michael Shuman's Report on the Economic Costs of the Naval Air Station (NAS) Whidbey Island complex was reviewed and summarized in Section 1.12 of the Environmental Impact Statement (EIS). The report was submitted to the Navy as a public comment on the Draft EIS. Mr. Shuman concluded that major external costs from the Proposed Action--including the health impacts of noise, the impacts to property values, the impact of potential accidents, and the impact to tourism--have not been adequately considered and calculated and makes some attempts to quantify these impacts. The Navy has added impacts to tourism to the Final EIS. The EIS also analyzes the health impacts of noise, impacts to property values, and accident potential. See Chapter 4 of the EIS for a discussion of these impacts. As described in comment response 12.o and in Section 1.11.6 of the EIS, a cost-benefit analysis requested by Mr. Shuman and other commenters was not completed for the Proposed Action, and external costs were not monetized. It is beyond the scope of what is required by the National Environmental Policy Act to calculate and monetize these costs. Likewise, as stated in Section 1.12 of the EIS, it is beyond the scope of this EIS to critique the analysis, the methodologies, the assumptions, and the selected topics that Mr. Shuman used in his report.

It should be noted that NAS Whidbey Island contributes significantly to local economies in Island County and to a lesser degree in Skagit County. With approximately 10,000 employees, the installation is four times the size of the next-nearest employer in Island, San Juan, Skagit, and Whatcom Counties (Island County EDC, 2013). Based on a 2013 study by the Island County Economic Development Council, the military payroll for the installation contributed $726 million into Island County's economy and $15 million into Skagit's, and federal civilian payroll contributed $107 million. Furthermore, the numbers of veterans living near the installation are three times higher than the national average. In 2011, veterans in Island County and Skagit County received, respectively, $44 million and $28 million in retirement and disability payments. While not a comprehensive economic report, the 2013 study describes the direct and indirect benefits of wages, salaries, and benefits of the installation. It included medical insurance (Tricare) reimbursements to local health care providers, financial assistance to local schools, credit purchases, volunteers and donations to community service programs, service contracts to hire local residents with disabilities, conservation programs, and medical evacuation and rescue support to area residents and visitors. In addition, the increase of personnel and their dependents at the NAS Whidbey

Island complex would have a positive impact on the generation of tax revenues in Island and Skagit Counties. Navy personnel and their dependents living in the community would generate revenues for local government entities through sales and use taxes levied on their purchases and through ad valorem property taxes that the personnel pay directly if they own their own home or pay indirectly via their rental payments. This additional revenue stream is expected to offset local government expenditures on community services for these Navy families.

12.c. Socioeconomic Impacts

As described in Section 1.3, funding for the Growler aircraft has been appropriated to the Navy by Congress. It is not within the Navy's authority to determine how Congressional funds should be spent. Furthermore, it is beyond to the scope of this analysis to consider other possible uses for these funds.

The analysis does discuss both the positive and negative economic impact that the Proposed Action would have on the regional economy. See Section 4.10.2.2 for a discussion of employment, tax, tourism, and property value impacts. In addition, Section 3.10.3 describes some of ways in which the Navy assists the local community.

In general, the analysis acknowledges that the Proposed Action will have both positive and negative impacts on the population, economy, tourism, property values, and community services of communities in Island County and Skagit County. The analysis provides some quantitative and qualitative description of economic impacts under the Proposed Action resulting from the increase in Navy personnel and their dependents. A discussion of impacts to property values and tourism resulting from increased noise is also provided.

More specifically, the analysis in Section 4.10 discusses that the Proposed Action would have some positive benefits to local tax revenue as a result of the increased employment and earnings at the Naval Air Station (NAS) Whidbey Island complex. The distribution of this tax income is expected to mirror the geographic population distribution of existing Navy households presented in Table 3.10-2. In addition, Section 4.10.2.5 of the Environmental Impact Statement (EIS) analyzes the potential increase in local government tax receipts from each of the proposed alternatives. This analysis is based on current per capita sales, ad valorem property, and other local tax receipts. It is beyond the scope of this EIS to analyze how much more sales tax receipts Island county would receive from Navy families if the county had per capita sales tax revenues that were closer to the statewide average.

The EIS notes that direct employee earnings from the new personnel at the NAS Whidbey Island complex would originate at the NAS Whidbey Island complex; however, additional indirect economic benefits such as employment opportunities for civilians and veterans would occur throughout Island and Skagit Counties. The analysis also acknowledges the Navy is a large contributor to the economy, but the reliance of the economy on the Navy or lack of economic diversification is beyond the scope of this analysis.

In Section 4.10.2.2, the Navy acknowledges that any increased economic activity generated by construction expenditures would be short term in duration. In addition, the Navy acknowledges that spending patterns by military personnel would most likely differ from civilian spending patterns. However, the economic impact estimates made in the analysis are the result of using an input-output model developed by the U.S. Bureau of Economic Analysis. This model (RIMS II) generates economic estimates by using historical spending patterns within the regional economy. Since there is already a

currently large presence of military personnel in Island and Skagit Counties, these spending patterns will have already been incorporated into regional spending statistics and therefore already are in the model.

12.d. Population Impacts

The analysis discusses population changes in communities surrounding the Naval Air Station Whidbey Island complex since 2000 and the complex's influence on the local and regional economy. See Sections 3.10.2.1 and 3.10.2.2 for a description of these topics. The analysis also acknowledges the increase in population as a result of the Proposed Action would have impacts on natural and manmade resources, including community services, transportation, utilities, and water. See Chapter 4 for a discussion of these impacts.

The Environmental Impact Statement quantifies the number of personnel and dependents coming into the region based on the defined alternatives. It is too speculative to assume that implementation of the Proposed Action would create large amounts of out-migration in the region or to quantify any such impact.

12.e. Agriculture Analysis

The agricultural community already experiences noise under existing conditions; the Proposed Action will increase frequency of noise exposure due to the increase in airfield operations. The Navy acknowledges that agricultural workers may be annoyed by the noise events. For the purposes of this Environmental Impact Statement, additional analysis has been added discussing potential impacts the Proposed Action might have on agriculture in the affected area; see Sections 3.10.2.2 and 4.10.2.2.

The analysis acknowledges that depending upon the exact location of a farm and the amount of expected noise exposure, some outdoor farm workers would be affected, and there could be a minor loss of productivity in farms located in the highest noise-level contours during flight operations because verbal communication may become more difficult. In addition, some agricultural operations may be required to expend funds to meet U. S. Occupational and Health Administration health and safety requirements for noise protection for outdoor farm workers. However, these impacts and additional costs are expected to be minor; see Section 4.10.2.2. The Navy further acknowledges that farm workers currently employed on farms within some of the loudest noise-level contours already experience this noise and that implementation of the Proposed Action would increase the frequency of this noise exposure.

Further, the analysis acknowledges that expanded operations at Ault Field and Outlying Landing Field Coupeville could negatively affect some patrons' experience at outdoor farmers' markets in the area. However, this effect would not be expected to significantly alter the agricultural industry in the affected region; see Section 4.10.2.2.

12.f. Economic Hardship and Impacts

The Navy acknowledges that implementation of the Proposed Action may have some adverse economic impacts on specific businesses located under the loudest noise-level contours. Commercial businesses and other enterprises in the local area already experience noise under existing conditions, and the Proposed Action will increase frequency of exposure due to the increase in airfield operations. Tourism entities and other noise-sensitive industries may be affected to a greater degree than other enterprises. However, it is beyond the scope of the National Environmental Policy Act to analyze financial and

economic impacts on specific businesses; therefore, only a general qualitative analysis was completed for this Environmental Impact Statement. See Section 4.10.2.2 for additional discussion of these topics.

A detailed analysis of noise impacts on worker productivity is also beyond the scope of this analysis. However, as stated above, impacts on noise-sensitive industries (including agriculture) have been added to Section 4.10.2.2. The Navy acknowledges that although the Proposed Action will not directly impact agricultural production or other noise-sensitive industries, some minor costs in production may occur as a result of the Proposed Action. Noise-sensitive industries may incur additional costs from loss of productivity, potential expenditures for noise reducing equipment, and decreased patronage during high-noise events.

12.g. Commercial and Recreational Fishing

The fishing community already experiences noise under existing conditions, but the Proposed Action will increase the frequency of noise exposure due to the increase in airfield operations. The Navy acknowledges that fisherman may be annoyed by the noise events. The analysis in Section 4.8 assesses the impact of expanded operations at the Naval Air Station Whidbey Island complex on terrestrial and marine wildlife. Visual and noise disturbances from increased aircraft operations under the Proposed Action would not significantly impact terrestrial and marine wildlife. Therefore, no specific impacts to commercial or recreational fishing are anticipated. Please see Section 4.8 for a detailed evaluation of potential effects to terrestrial and marine wildlife and Section 4.10.2.2 for a discussion of potential impacts to the tourism industry in general.

12.h. Tourism

Sections 3.10.2.2 and 4.10.2.2 have been expanded to consider the impact of the Proposed Action on local tourism. The analysis acknowledges that tourism is an important economic industry in the region. The analysis evaluates tourism for Island, Skagit, and San Juan Counties because they comprise areas within or immediately adjacent to the greater than 65 decibel (dB) day-night average sound level (DNL) noise contours associated with the Proposed Action. Jurisdictions outside the greater than 65 dB DNL noise contours are not anticipated to be significantly affected by aircraft noise; therefore, they were not evaluated.

Additional information has been added to the Environmental Impact Statement (EIS) that provides background information on the tourism industry, which already experiences noise under existing conditions, and provides attendance figures at major tourist attractions in the study area, including the state parks in Ebey's Landing National Historical Reserve, three state parks in the San Juan Islands, and Deception Pass State Park (See Section 3.10.2.2). In addition, a qualitative analysis of potential impacts to the tourism industry in Island, Skagit, and San Juan Counties has been included in Section 4.10.2.2. Because of data constraints, the tourism industry economic analysis was performed primarily at the county level. Section 4.5.2.2 has been revised to cite additional studies looking at the impacts of recurring, intrusive aircraft noise on recreational experiences and perceptions of scenic landscapes. The analysis acknowledges that expanded operations at Ault Field and Outlying Landing Field Coupeville and the increased frequency of noise could negatively affect visitors' experiences at certain tourist locations located near the greater than 65 dB DNL contours, thereby reducing the time spent at these tourist destinations from that spent under existing conditions. However, based on past evidence and the limited number of locations affected by the change in noise levels under the Proposed Action, it is not expected to reduce the number of visitors to the region. Additionally, visitor days and visitor

expenditures are not expected to be reduced, and tourism in the region therefore is not expected to decline significantly. Because many non-noise-related factors can affect tourism, the analysis does not attempt to quantify changes in tourism revenues or visitor numbers in individual communities or at specific visitor destinations as a result of the Proposed Action. Please see Section 3.10.2.2 for historical tourism and attendance data and Section 4.10.2.2 for a discussion of potential impacts from the Proposed Action.

Many public comments on the Draft EIS were received regarding impacts to whale watching and other wildlife-observation-based tourism industries. The EIS assesses the impact of expanded operations at the Naval Air Station Whidbey Island complex on terrestrial and marine wildlife in Section 4.8. Visual and noise disturbances from increased aircraft operations under the Proposed Action would not significantly impact terrestrial and marine wildlife. Therefore, no specific impacts to wildlife viewing or whale watching are anticipated. See Section 4.8 for a detailed evaluation of potential effects to terrestrial and marine wildlife and Section 4.10.2.2 for a discussion of potentials impacts to the tourism industry in general.

12.i. Housing Access and Affordability

Additional information has been added to Sections 3.10.2.3 and 4.10.2.3 concerning housing affordability/housing availability. The Navy acknowledges that the additional personnel to be stationed at the Naval Air Station (NAS) Whidbey Island complex would increase the demand for housing in a region where the supply of available housing units is limited. In the short term, the increase in demand would likely further decrease housing availability and increase housing prices and rental costs. In the longer term, it is anticipated that local developers will respond to the increased price and demand for housing by constructing more units, thereby slightly reducing the expected effects on prices and availability. The Navy further acknowledges that the increase in the cost of housing and the decrease in available properties may have a negative impact on low-income residents, who typically spend a larger proportion of their income on housing than the general population.

The Navy does not restrict where NAS Whidbey Island complex personnel live in the community. The Navy does not intend to implement restrictions on places of residence for Navy personnel to support the increase in aircraft operations at the NAS Whidbey Island complex. For those personnel eligible to live off station, the Navy considers any community within a 1-hour commuting distance to be acceptable. The Navy does not intend to construct new housing at NAS Whidbey Island for Navy personnel to support the increase in aircraft operations at the NAS Whidbey Island complex. However, the Navy periodically assesses on- and off-base housing demand and availability to determine whether additional Navy-controlled housing is required for service members and their dependents. See Section 4.10.3 for additional detail.

12.j. Property Values

The analysis acknowledges that increased operations at Ault Field and Outlying Landing Field (OLF) Coupeville may potentially have a negative impact on surrounding property values from the increased frequency of noise exposure. As discussed in Section 4.10.2.4 (Socioeconomic Impacts, Alternatives 1 through 3 – Property Values) and in Appendix A, aircraft noise could affect the value of property under the greater than 65 day-night average sound level noise contours. As described, based on a review of relevant technical articles, property values are expected to decrease by 0.2 percent to 2.0 percent per additional decibel (dB) of sound. On average, property values would decrease by approximately 0.5

percent per dB. The actual change in value will vary from location to location, and property values are affected by many non-noise-related factors. Property values are dynamic and influenced by a combination of factors, including market conditions, neighborhood characteristics, and individual real property characteristics (e.g., the age of the property, its size, home amenities, and lot size). The degree to which a particular factor may affect property values is influenced by many other factors that fluctuate widely with time and market conditions. These same factors enter into the personal decision for people to purchase a home. The frequency of flights and the noise related to them are two of many factors that may affect changes in property values. The total number of daily operations at Ault Field and OLF Coupeville under each alternative is less than the daily operations at several of the airports that were included in the review of relevant technical articles discussed in Section 4.10.2.4, Property Values. Therefore, since many non-noise-related factors can affect property values, the analysis does not attempt to quantify changes in property values as a result of the Proposed Action.

Additionally, as discussed in Section 4.10.2.4, the monetary loss associated with the decline in property values only affects those owners who purchased their property prior to the proposed increase in operations and noise levels. Buyers who willingly purchase these properties after the increase in noise will do so at a discounted rate. Because each property owner will willingly enter into this real estate transaction, it can be assumed that these owners will be accepting the lower price as compensation for the aircraft noise.

In addition, it is outside of the scope of this analysis to complete online mapping of flight paths in conjunction with property values to support the increase in aircraft operations at the Naval Air Station Whidbey Island complex.

While the Navy acknowledges that some decrease in property values may occur as a result of increased operations at Ault Field and OLF Coupeville, it does not anticipate that this decline in value would be substantial enough to significantly affect local government's ad valorem property tax receipts. As described in Section 4.10.2.4, while some reduction in property values in the highest noise-level areas is anticipated, local property values for the area as a whole are expected to experience upward pressure as a result of the influx of additional Navy personnel. These personnel would increase the demand for housing in a market that is already experiencing low vacancy rates and increasing housing prices independent of the Navy's Proposed Action. Therefore, housing prices in the region are expected to continue to increase after implementation of the Proposed Action, and no substantial changes in ad valorem property receipts are anticipated as a result of the Proposed Action.

The Proposed Action would not physically occupy any private property or take control of any private property through the use of eminent domain. The Navy recommends that land use within accident potential zones be minimal or low density, but it does not restrict existing land uses; land use decisions are made by the local government. See Sections 3.5.2.2, and 4.5.2.1 for a more detailed discussion of the topics.

12.k. Compensation to Citizens for Private Property

Numerous public comments have asked for the Navy to pay for various forms of property improvements or for various forms of compensation. With regard to property improvements, the Navy does not have authority to expend appropriated funds on improvements to state, local, or private property.

Several commenters referenced the Federal Aviation Administration's (FAA's) ability to do so as part of its Part 150 program, but that program is specific to the FAA. Specific Congressional authorization and

appropriation for the Navy would be required to establish a similar program, and the Navy does not currently intend to seek such an authorization. In addition to sound attenuation, several comments suggested that the Navy should pay for perceived loss of property values, loss of business profitability, personal hearing protection, compensation for leaving the home, or other forms of compensation for losses alleged from aircraft operations.

As discussed in the Navy's response to comments questioning the methodology underlying the noise analysis (see Sections 3.2 and 4.2), noise impacts analyzed in this document are predictive. This approach to noise modeling has been adopted by the FAA and the military services, and approved by reviewing courts as the best available methodology for describing noise impact on communities, but, as the Environmental Impact Statement notes, this response is a subjective, individual response to stimulus affected by many variables. It is beyond the scope of this assessment to forecast individual response to this impact at the level of whether an individual will be sufficiently disturbed by the aircraft to bring claims against the Navy or whether the impact will rise to the level of a legally compensable taking. Moreover, as noted, the Navy's ability to expend appropriated funds is limited by law. To the extent individuals believe they have experienced damages or injury from Navy activities, they may pursue a claim against the Navy. Several public comments inquired whether the Navy would condemn private property. The Navy has no intention of condemning private property as part of the Proposed Action.

Separately, several comments alleged that realtors provide, or have provided, misleading information regarding noise levels near Navy airfields. The Navy has no control over private real estate transactions or whether sellers and/or realtors misrepresent the historical noise environment around a real estate parcel. The Navy believes that all lawful disclosures, including noise, should be provided to a prospective buyer prior to purchase. Island County and the City of Oak Harbor have adopted noise-disclosure ordinances whereby noise disclosure is the responsibility of the property owner and his or her agents.

12.l. Community Service Impacts

The analysis provides an assessment of impacts to community services within the economic study area. This analysis includes schools, hospitals, police, fire services, and social services.

The analysis provides an assessment of impacts to police, fire, and medical services in the City of Oak Harbor and Town of Coupeville under the Proposed Action. This discussion includes a description of existing medical facilities in the study area and availability of emergency room services. See Section 4.10.3 for an assessment of these impacts. The analysis provides an assessment of impacts to social services under the Proposed Action. The analysis acknowledges Navy personnel rely on both social services in the community and services offered through Navy's Fleet and Family Support Center. See Section 4.10.3 for an assessment of these impacts.

Community involvement and community service are an important part of the Navy’s interaction with the local area. As described in Section 4.10.3, Naval Air Station (NAS) Whidbey Island personnel volunteer thousands of hours of service each year and participate in trash cleanups at parks throughout the region; volunteer at local schools, clubs, and sports programs; provide classes to home-schooled students; and lead local boy and girl scout troops. In addition, the Navy search and rescue (SAR) service at NAS Whidbey Island is tied to the Growler mission. The Navy’s SAR teams typically maintain a 24-hour support posture to provide medical care and transport as well as SAR operations over water, land, and mountainous terrain. The Navy SAR unit operates three MH-60S helicopters from NAS Whidbey Island as search and rescue/medical evacuation (SAR/MEDEVAC) platforms for the EA-18G aircraft as well as

other squadrons and personnel assigned to the installation. Pursuant to the National SAR Plan of the United States, the unit may also be used for civil SAR/MEDEVAC needs to the fullest extent practicable on a non-interference basis with primary military duties according to applicable national directives, plans, guidelines, and agreements; specifically, the unit may launch in response to a tasking by the Air Force Rescue Coordination Center for inland missions and/or tasking by the United States Coast Guard for all other aeronautical and maritime regions, when other assets are unavailable.

12.m. Education Impacts

The analysis provides an assessment of impacts to education and schools under the Proposed Action. See Section 4.10.3.1 for a complete discussion of these impacts.

The analysis discusses how the increase in school-aged children expected at the Oak Harbor, Coupeville, Anacortes, and other school districts would impact school capacity. Projected enrollments are based on the existing geographical distribution of military families currently stationed at the Naval Air Station Whidbey Island complex. Based on current distribution, no Navy personnel are expected to live on Lopez Island. Therefore, enrollment impacts to the Lopez Island School District are not discussed. The Navy acknowledges that the Proposed Action will exacerbate existing overcrowded conditions in the Oak Harbor School District, specifically in the elementary school. Due to state restrictions on classroom sizes, no change is expected to occur in the number of students per classroom. However, the number of classrooms and teachers would increase.

The analysis acknowledges that local school districts would be required to take steps to accommodate the projected increase in school-aged children under the Proposed Action and indicates the use of portable classrooms could be a possible solution used to accommodate the additional students. However, how these additional students would be accommodated, including through the construction of additional schools or the reconfiguration of existing schools, would be determined by each school district. The selected alternative would be expected to be fully implemented by 2021, which would provide school districts some time before being required to accommodate the full increase in school-aged children.

The analysis provides data on the number of students enrolled in the Oak Harbor, Coupeville, and Anacortes school districts who are dependents of at least one parent in the military (See Section 3.10.3). A decrease in Navy personnel is not part of an alternative under consideration; therefore, impacts to schools from a decrease in military dependent students is not analyzed.

No schools are located in the conceptual Accident Potential Zones for the Proposed Action. See Section 4.3.2 for an assessment of public health and safety impacts.

Federal impact aid is provided to public schools with “federally connected students”; however, the analysis acknowledges this aid does not cover the full per-pupil costs. Federal impact aid is provided to affected districts by the U.S. Department of Education. The Navy does not have the authority to provide supplemental funding to schools without Congressional authorization and appropriation of funds. See Section 3.10.3 and Section 4.10.3 for a discussion of federal impact aid levels. In addition, approximately 40 percent of military families and 58 percent of unaccompanied Navy personnel reside off-base in the local community. These personnel pay property tax either directly as homeowners or indirectly through their rental payments. These ad valorem property tax receipts contribute toward the cost of schools and other community services. As described in Section 3.10.2.4, ad valorem property taxes generated approximately 28.4 percent of the total revenues of the Island County government and 34.8 percent of

the total revenues of the Skagit County government. Therefore, property tax receipts are an important local funding source used to support schools and other community services.

The Navy does not intend to seek restoration of previous U. S. Department of Defense Office of Economic Adjustment programs or other funding streams for the construction of school facilities to support the Proposed Action. As described in Section 4.10.2.5, implementation of the Proposed Action would generate additional economic activity in the region that would, in turn, increase local government revenues. However, the Navy acknowledges that additional personnel associated with the Proposed Action and their dependents would also increase local government expenditures. Education would be particularly affected, and the Navy acknowledges that supplemental funds provided via the Federal Impact Aid Program operated by the U. S. Department of Education do not always cover the incremental costs associated with educating a federally connected student. The Navy will support local government efforts to apply for U. S. Department of Defense Office of Economic Adjustments program, if local governments qualify for the offered programs.

12.n. Quality of Life

Quality of life is a subjective determination based on personal experiences and preferences. Some of the community characteristics that affect quality of life include population density; educational, recreational, and cultural opportunities; housing characteristics; and access to community and health care services. The preferences and values attributed to these characteristics will vary by the individual as well as the form in which these characteristics are presented in the community. Therefore, the Environmental Impact Statement (EIS) does not analyze the effects on a specific individuals' quality of life.

However, the effects of noise on quality of life are discussed in Sections 3.2 and 4.2, as well as in Appendix A1. These effects would include an increase in annoyance, indoor/outdoor speech interference, sleep interference, classroom learning interference, and impacts to recreation. These noise impacts are generally limited to the higher-level noise contours in the vicinity of the airfields. Although the average sound level will increase, aircraft operations will not occur continuously. Other potential impacts to resources that could be considered as quality of life effects are discussed in Section 4.5.2, including community character and impacts on recreation and wilderness areas, as well as in Section 4.10, Socioeconomics, including employment and income, housing, and community services and facilities.

In response to public comments on health and student success, a new appendix (Appendix I, Community Health and Learning Review) was added to the EIS that shows, in statistical terms, that residents of Island County are enjoying good health and their students are succeeding in schools, which are some of the indicators of good quality of life.

12.o. Cost-Benefit Analysis

Many comments were received on conducting a cost-benefit analysis of the Proposed Action. Section 1.11 of the Final EIS provides details on this topic. The analysis discusses impacts to the natural and human environment in both qualitative and quantitative terms as applicable, but it does not attempt to assign a monetary value to these impacts. A cost-benefit analysis is beyond the scope of this Environmental Impact Statement (EIS) and therefore is not included. Likewise, monetizing major external costs from the Proposed Action--including the impacts of noise, the impacts to property values,

the impact of potential accidents, and the impact to tourism--is also beyond the scope of this EIS. In accordance with the National Environmental Policy Act, these impacts have been analyzed in the Final EIS, but their values have not been converted to dollar amounts.

The purpose of the National Environmental Policy Act is to assess the environmental impacts of a proposed federal action. The Proposed Action evaluated in this analysis is described in Section 1.1. A meaningful comparison of the alternatives under consideration must entail a comparison of multiple factors and, as such, does not lend itself to a monetary cost-benefit analysis; moreover, one is not required. As set forth in 40 Code of Federal Regulations (CFR) 1502.23, "For purposes of complying with [the National Environmental Policy Act], the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations." Given the purpose and need is ultimately to enhance the Navy's warfighting capability, qualitative considerations such as operational synergy and efficient logistical support weigh more heavily than a pure cost analysis. Given the purpose and need as defined in Section 1.3, qualitative considerations are primary. The Final EIS evaluates the impacts of each alternative within relevant resource areas, assesses the significance of those impacts, and provides an indication of the considerations relevant and important to a decision. The Navy is not making a decision on selection of alternatives based on financial criteria; rather, the Navy is weighing the relative impacts of each to mission, operational capabilities and efficiencies, training, personnel, environmental protection, and fiscal budget authorizations. Accordingly, a cost-benefit analysis would not aid the decision.

12.p. Local Differences in Economy

The Navy acknowledges that the economic structure of the Town of Coupeville and the City of Oak Harbor differ and that each municipality has a different community character and a different approach to new development and growth management. (See Sections 3.5.2.3 and 4.5.2.1.2 for a detailed discussion of community character.) However, both communities would experience both the positive and the negative economic effects of the Proposed Action. The economic analysis has been completed at the regional/countywide level because the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor Statistics, and the U.S. Census Bureau collect only limited economic data for communities with populations of less than 20,000.

13. Environmental Justice

13.a. Environmental Justice Impacts

The analysis of environmental justice communities is based on guidance from Executive Order 12898. This analysis identifies the existence of environmental justice communities (i.e., minority or low-income populations) impacted by the Proposed Action and determines whether impacts on these communities are disproportionately high and adverse. Although impacts may disproportionately impact one community over another, the focus of environmental justice in the National Environmental Policy Act process is on those communities that are made up primarily of low-income and minority populations. As described in Section 4.11, the Navy identifies environmental justice communities and potential disproportionately high and adverse impacts under the No Action Alternative and the alternatives with respect to communities living under conceptual and existing accident potential zones, communities living under the noise contours, housing affordability, and community access to public education, specifically in Oak Harbor. The Navy has concluded that there are environmental justice communities

within the affected area, and there are significant impacts outlined within the EIS to populations living within the affected area (noise impacts to those living within the 65 decibel [dB] day-night average sound level [DNL] noise contours and overcrowding at Oak Harbor School District schools). However, the Navy has determined that there will be no disproportionate high and adverse human health or environmental effects from noise, Clear Zones/Accident Potential Zones, or school overcrowding on minority populations or low-income populations. The Navy has, however, concluded that impacts on housing availability and housing affordability could have the potential to have a disproportionately high and adverse impact on low-income communities. Some low-income residents could be priced out of the market, and fewer households would be able to obtain affordable housing.

Many public comments on the draft analysis were concerned with the potential of low-income populations wanting to move due to the new noise impacts but not being able to afford to move. The Navy acknowledges this situation; however, it is impossible to accurately predict whether or how the demographic and economic composition of the affected census geographies may change as a result of the Proposed Action. Many factors influence the demographic and economic attributes of a neighborhood, including factors such as societal change, general economic conditions, and overall regional diversity. It would be too speculative to assume that only low-income residents would remain within the 65 day-night average sound level noise contours.

Additional public comments were received on the draft analysis concerning the impacts to migrant and agricultural workers in Island and Skagit Counties. The socioeconomic analysis has been expanded to quantify the number of agricultural workers employed in Island and Skagit Counties (see Sections 3.10 and 4.10). With respect to environmental justice concerns, no disproportionate impacts are expected to occur to these populations due to the small number of reported migrant workers (a total of seven workers in all of Island County). It is often difficult to quantify the number of seasonal and migrant workers. Many migrant workers are working outside their home country and move from place to place following growing seasons. Some do not officially check in with agencies or local support groups. Other agricultural workers are assumed to reside in the area and therefore have been taken into account in the larger environmental justice analysis (see Section 4.11).

14. Transportation

14.a. Transportation Impacts

There will be impacts to transportation that include an increase in traffic and increase in delays on roadways and intersections near Ault Field during peak hours. The analysis provides an assessment of reasonably foreseeable transportation impacts from the increased number of Navy personnel and their dependents under the Proposed Action. A determination of transportation start- and end-points (e.g., residences, jobs, and schools) for Navy personnel and their dependents cannot be reasonably predicted; therefore, traffic impacts and projections are based on existing recorded traffic volumes across local and county roads. Since monthly and seasonal traffic counts are unavailable for roadways in the study area, Chapter 4 qualitatively discusses potential traffic impacts during peak tourist season.

Based on standards set by local jurisdictions discussed in Section 4.12, the Proposed Action has the potential to increase traffic congestion but not cause roadways to operate below an acceptable level of service. The analysis includes a quantitative assessment of impacts to traffic on state roads and county roads near Ault Field (see Chapter 4). The analysis also discusses how, if requested by local municipalities, some measures could be implemented to reduce traffic congestion near Ault Field.

However, the Navy does not intend to fund transportation improvements to support traffic associated with the Proposed Action's increase in aircraft operations at the Naval Air Station Whidbey Island complex.

14.b. Vehicle Collisions and Safety

The Environmental Impact Statement (EIS) discusses reported vehicle collisions in Island County (see Chapter 3 for a discussion of collision rates). No accidents were reported near Outlying Landing Field Coupeville in 2014 (the most recent year for available data). County-wide, collision rates were lower than the state average. Chapter 4 also discusses traffic safety near Naval Air Station Whidbey Island. The Washington State Department of Transportation is responsible for operating and maintaining the state highway system. Concerns about speed limits or road alignments of State Route 20 or State Route 525 should be directed to the Washington State Department of Transportation.

Many public comments on the Draft EIS were submitted concerning the roundabout traffic on State Route 20. The analysis provides an assessment of traffic impacts on State Route 20 based on existing conditions. Chapter 4 provides an assessment of these impacts. The Washington State Department of Transportation has plans to install roundabouts at a number of intersections to improve safety and traffic flow. Information on impacts regarding installation of roundabouts on State Route 20 can be obtained from the Washington State Department of Transportation.

14.c. Pedestrians, Bicycles, and Bus Stops

The analysis discusses existing pedestrian and bicycle facilities at the Naval Air Station (NAS) Whidbey Island complex and the Navy's plans to expand these facilities. The Navy does not intend to promote alternative transportation modes to support the Proposed Action's increase in aircraft operations at the NAS Whidbey Island complex. Chapter 4 provides an assessment of expected transportation impacts, including traffic safety and potential delays to public transit.

14.d. Bridges and Ferries

Deception Pass Bridge and regional ferries provide the only vehicular access to Naval Air Station (NAS) Whidbey Island, via State Routes 20 and 525. In addition, Deception Pass Bridge is the sole access point for some utilities to NAS Whidbey Island. Based on the analysis, the Proposed Action is not expected to significantly increase traffic across the bridge (see Section 4.12). The transportation analysis discusses the structural condition of the regional bridges (see Section 3.12). The Washington State Department of Transportation has indicated the bridges are in good condition, and the state has no plans to replace them.

An analysis of how the bridge, ferries, and roads affect vehicular and utility access to NAS Whidbey Island is beyond the scope of this analysis.

14.e. Military Vehicles

The Proposed Action would not require any additional military vehicles. Any oversize construction vehicles needed for construction would be required to obtain a permit from the Washington State Department of Transportation to travel on state roads. Chapter 4 provides an assessment of expected traffic impacts.

15. Infrastructure

15.a. Infrastructure

The Navy acknowledges that its personnel use public infrastructure and that there will be impacts to it. However, based on existing and planned capacities discussed in Section 4.13, the increase in demand for infrastructure services would be within the capacity of these systems. The Navy does not intend to fund public infrastructure improvements to support the Proposed Action's increase in aircraft operations at the Naval Air Station Whidbey Island complex.

15.b. Potable Water and Wastewater Capacity

The analysis discusses current potable water and wastewater treatment capacity within the study area. The description of public community water systems in Section 3.13.2.2 has been updated with the latest information from the U. S. Environmental Protection Agency. Projected demand for potable water and production of wastewater under the Proposed Action are expected to be within current capacity of water and wastewater systems within the study area (see Chapter 4).

15.c. Groundwater

Section 3.9.2.1 discusses groundwater aquifers in the study area. Projected potable water consumption is based on existing geographical distribution of military families currently stationed at the Naval Air Station Whidbey Island complex. The majority of new Navy households would be expected to live in communities served by surface water sources, and only a small number of new households would rely on groundwater wells. Section 4.13.2.1 provides an assessment of impacts to groundwater.

15.d. Septic

Projected wastewater production is based on existing geographical distribution of military families currently stationed at the Naval Air Station Whidbey Island complex. The majority of new Navy households would be expected to live in communities with existing wastewater infrastructure, and only a small number of new households would rely on septic systems. Section 4.13.2.2 provides an assessment of impacts to wastewater management.

15.e. Personnel

Section 2.3.2 provides the number of proposed new Navy personnel and dependents under each alternative. Table 2.3-3 provides the total number of Navy personnel associated with Growler operations and Naval Air Station Whidbey Island, with the number of new personnel and dependents provided in parentheses. Impacts to transportation and utilities discussed in Chapter 4.12 and 4.13 are based on these data.

16. Geological Resources

16.a. Geological Hazards (Seismic, Liquefaction, Bluff Erosion, and Landslides)

Discussion of existing geological hazards, including earthquakes, landslide and liquefaction susceptibility, and bluff erosion potential, is included in the analysis and can be found in Section 3.14.2.3, Seismic Activity and Geologic Hazards. This discussion has been expanded to include more recent potential

seismic activity along nearby faults. Potential impacts to geological hazards from the Proposed Action are included in the analysis and can be found in Section 4.14.2.1, Geological Resources Potential Impacts.

Under each of the three alternatives, construction and operation activities, including increases in Growler activity, would not result in impacts to seismic activity or risks, liquefaction risk, landslide risk, or bluff erosion.

All buildings constructed under the Proposed Action would be designed to conform to the seismic provisions of the Washington State Building Code. It is not within the scope of analysis to evaluate potential risks posed by possible geologic hazards to Navy assets.

17. Hazardous Materials and Waste

17.a. Hazardous Materials and Waste Impacts

Operation and maintenance of additional Growler aircraft would not introduce any new hazardous materials and/or waste streams to the Naval Air Station (NAS) Whidbey Island complex. While the addition of Growler aircraft would increase the amount of hazardous materials handled and generate increased amounts of hazardous wastes, this increase would be managed by existing hazardous material and waste management functions and facilities at NAS Whidbey Island. Likewise, the addition of Growler aircraft would not result in significant impacts with regard to the handling, use, storage, or disposal of fuel, oils, and lubricants at NAS Whidbey Island. All hazardous wastes would continue to be collected and managed on site in accordance with NAS Whidbey Island's hazardous waste management plan. Appropriate procedures for handling of hazardous materials and best management practices for the management of hazardous substances and spill/crash response at NAS Whidbey Island would be applied. Hazardous waste management activities would follow existing procedures for the safe handling, use, and disposal of hazardous substances and waste. Therefore, implementation of any of the alternatives would not result in significant impacts to hazardous materials and wastes. For more information on this topic, see Sections 3.15 and 4.15, Hazardous Materials.

18. Climate Change and Greenhouse Gases

18.a. Climate Change and Greenhouse Gases

Refer to Sections 4.4, 3.16 and 4.16 for a discussion of the impacts of climate change in Puget Sound and the Navy's commitments to reduce air emissions from mobile and stationary sources. See Section 4.4 and 4.16 for additional information on greenhouse gas impacts. As discussed in Sections 3.16 and 4.16, the Navy has stated that climate change is a "threat multiplier"; therefore, the Navy is prepared to adjust operations and its mission to address the issue.

As described in Sections 3.16 and 4.16, greenhouse gas emissions were calculated using the most recently available data and methods from the U. S. Environmental Protection Agency and Washington State Department of Ecology. All emission factors and assumptions are provided in Appendix B.

18.b. Average Carbon Dioxide per Aircraft

As discussed in Sections 3.16 and 4.16, this analysis has estimated the emissions that will be produced by Growler field carrier landing practice over the course of a year. While 128,700 to 130,000 total

annual airfield operations are proposed per year for the Naval Air Station (NAS) Whidbey Island complex, these operations are not constant, and power settings vary based on the type of operations. According to air quality analysis assumptions (refer to Appendix B), each sortie--with one full landing and takeoff cycle, transit to Outlying Landing Field Coupeville, and eight touch-and-go operations--would take 95 minutes, or 1.6 hours. Each sortie would burn 1,480 gallons of jet fuel and produce 14.25 metric tons of carbon dioxide equivalent, for an average fuel use of 937 gallons per hour and an emission rate during operations of 9.03 metric tons of carbon dioxide equivalent per hour.

Under Alterative 2, Scenario A, the analysis predicts the highest emission increases, with a total of 126,132 metric tons of carbon dioxide equivalent from all flight operations at the NAS Whidbey Island complex from the 118 Growlers that would be stationed at Ault Field under this alternative and scenario. The average annual greenhouse gas emissions per aircraft would be 1,069 metric tons of carbon dioxide equivalent per year. The U. S. Environmental Protection Agency has estimated that cars produce an average of 4.7 metric tons of carbon dioxide equivalent per year; therefore, this is the equivalent of 205 cars for each aircraft.

18.c. Other Greenhouse Gases (beyond Carbon Dioxide)

Fossil fuel combustion results in greenhouse gas emissions of primarily carbon dioxide equivalent, with small amounts of methane and nitrous oxide. The Aircraft Environmental Support Office does not provide methane and nitrous oxide emission factors for aircraft because these emissions are negligible from the combustion of jet fuel. For other sources of greenhouse gases, methane and nitrous oxide emissions have been converted to a carbon dioxide equivalent and included in the totals where emissions factors are available.

18.d. Washington State Greenhouse Gas Goals

As discussed in Section 4.16, due to the drop in aircraft greenhouse gas emissions in Washington State, the increase in emissions from the Proposed Action is not likely to interfere with Washington's Greenhouse Gas Emission Reduction Goals. Chapter 173-442 of the Washington Annotated Code, the Clean Air Rule, was adopted in September 2016 and regulates the businesses that are responsible for about two-thirds of carbon pollution in Washington State, such as transportation, refining, and manufacturing. Naval Air Station Whidbey Island was not identified as a potentially eligible party under the new clean air rule because its stationary emissions have historically been below 25 tons.

19. Cumulative Impacts

19.a. Scope of Cumulative Analysis

The approach taken in the analysis of cumulative impacts follows the objectives of the National Environmental Policy Act, Council on Environmental Quality regulations and guidance, and U. S. Environmental Protection Agency guidance. Cumulative impacts are defined in 40 Code of Federal Regulations, Section 1508.7. Additional guidance implemented in this cumulative analysis includes the Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, Consideration of Cumulative Impacts in U. S. Environmental Protection Agency Review of National Environmental Policy Act Documents, and Council on Environmental Quality guidance entitled "Considering Cumulative Impacts under NEPA."

A cumulative impact is the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time-frame in which the coincidental effects could be expected to occur. For this analysis, the study area is resource-specific, as identified in Chapter 4 for the respective resource areas. The time-frame for cumulative impacts centers on the timing of the Proposed Action.

19.b. Revised Cumulative Impacts Analysis

Additional information pertaining to other past, present, and reasonably foreseeable future actions, as well as information pertaining to potentially affected resources, was received during the Draft Environmental Impact Statement comment period. Additional projects, both federal and non-federal, as well as connected actions, have been incorporated appropriately into Section 5.3, and they have been incorporated into specific resource analyses, as appropriate. Updated actions have been incorporated into a revised Section 5.3, and some environmental resources have been revised in Section 5.4.

19.c. Olympic Peninsula, Olympic National Park, and at-Sea Training

The Olympic Peninsula, including the Olympic National Park, is not part of the study area for this analysis. While multiple Navy actions are ongoing within the Pacific Northwest Region, each National Environmental Policy Act (NEPA) document addresses a specific Proposed Action, separated from other actions by its purpose and need, independent utility, timing, and geographic location. Some NEPA documents are stand-alone documents; others tier off of and/or expand the analyses of other existing NEPA documents. NEPA documents for at-sea training (e.g., the Northwest Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement) focus on training activities occurring within a range complex or Military Operations Area and involve different types of aircraft, ships, and range complex enhancements. However, NEPA documents that analyze a specific type of aircraft operation at a military airfield (in this case, the Growler) are focused in and around that airfield and its facility needs. While the Navy has analyzed, and is currently analyzing, various Proposed Actions in the area, those Proposed Actions are not preconditions for Growler operations at the Naval Air Station (NAS) Whidbey Island complex. Growler operations at the NAS Whidbey Island complex are not a precondition for larger military readiness activities on range complexes in the Pacific Northwest. Even in the absence of this Proposed Action, military training in the Pacific Northwest would continue independently from this Proposed Action, as analyzed in the documents referenced in Section 1.6.

While the Olympic Peninsula is not specifically addressed as part of the Proposed Action study area, it is included in two ways in this analysis: first, under the cumulative impacts analysis (as part of the Northwest Training and Testing Final Environmental Impact Statement [EIS]/Overseas EIS), as it was determined a relationship exists such that the affected resource areas of the Proposed Action might interact with the affected resource areas evaluated in other NEPA documents for the Olympic Peninsula (See Chapter 5), and, secondly, within the noise analysis, points of interest on and near the Olympic Peninsula have been included (see Sections 3.2 and 4.2).

19.d. Electronic Warfare

Comments were received during the public comment period for this Draft Environmental Impact Statement (EIS) that pertain to other regional efforts, including the Northwest Training and Testing (NWTT) Supplemental Draft EIS/Overseas Environmental Impact Statement (OEIS), the Electronic Warfare Range Environmental Assessment (EA), and the Naval Special Operations EA. These comments were forwarded to the relevant project teams to become part of their administrative record and analysis. In total, 251 comments were provided to the project teams for the NWTT Supplemental Draft EIS/OEIS and the Electronic Warfare Range EA, and eight were provided to the project team for the Naval Special Operations EA.

Inquiries were received about how earlier studies are related to the current Proposed Action. Information has been provided in Section 1.6 (Key Documents) of the EIS on the studies relevant to this Proposed Action. Documents are considered key because of similar actions, analyses, or impacts that are either directly relevant or inform the analysis of this Proposed Action. Under the Proposed Action, the Navy evaluated potential environmental impacts of increasing the capabilities of the Electronic Attack mission by increasing the number of Growlers operating at Naval Air Station (NAS) Whidbey Island and associated personnel changes. This EIS does not analyze impacts of Growler training occurring at existing range complexes, Special Use Airspace, and testing ranges. The Navy prepares separate National Environmental Policy Act (NEPA) documents addressing home basing and training because each of these documents is focused on the specific action that occurs at these locations. These actions are separated from other actions by their purpose and need, independent utility, timing, and geographic location. While the Navy has analyzed, and is currently analyzing, various proposed actions in the area, those proposed actions are not preconditions for Growler operations at the NAS Whidbey Island complex. Growler operations at the NAS Whidbey Island complex are not a precondition for larger military readiness activities on range complexes in the Pacific Northwest. Even in the absence of this Proposed Action, military training in the Pacific Northwest would continue independently from this Proposed Action as analyzed in the documents referenced in Section 1.6.

Growler operations at the NAS Whidbey Island complex do not automatically trigger larger military training activities in the Pacific Northwest. Likewise, Navy military readiness activities proceed independently of whether this Proposed Action is implemented. NEPA documents that address training typically analyze various training activities of many different types of aircraft and ships within an existing military range. This EIS focuses on the facilities and functions to support Growler operations at the NAS Whidbey Island complex. The Navy does consider the impacts from past, present, and reasonably foreseeable future actions in Chapter 5 (Cumulative Impacts).

19.e. Naval Special Operations EA

Comments were received during the public comment period for this Draft Environmental Impact Statement (EIS) that pertain to other regional efforts, including the Northwest Training and Testing (NWTT) Supplemental Draft EIS/Overseas Environmental Impact Statement (OEIS), the Electronic Warfare Range Environmental Assessment (EA), and the Naval Special Operations EA. These comments were forwarded to the relevant project teams to become part of their administrative record and analysis. In total, 251 comments were provided to the project teams for the NWTT Supplemental Draft EIS/OEIS and the Electronic Warfare Range EA, and eight were provided to the project team for the Naval Special Operations EA.

Growler operations at the Naval Air Station (NAS) Whidbey Island complex do not automatically trigger larger military training activities in the Pacific Northwest. Likewise, Navy military readiness activities proceed independently of whether this Proposed Action is implemented. This EIS focuses on the facilities and functions to support Growler operations at the NAS Whidbey Island complex. The Navy does consider the impacts from past, present, and reasonably foreseeable future actions in Chapter 5 (Cumulative Impacts).

19.f. Outlying Landing Field Coupeville Security Blocks

The Navy installed security blocks around the perimeter of Outlying Landing Field Coupeville in November 2013 in order to ensure public safety by keeping vehicles off the runway. This project has been completed and is not part of the Proposed Action for this Environmental Impact Statement. Table 5-1 and associated cumulative impacts analyses include this project as a recent past project.

19.g. Cumulative Impacts of Noise

Cumulative impacts to the noise environment are addressed in Section 5.4.2. This section analyzes all previous, ongoing, and reasonably anticipated changes to the noise environment, including both increases and decreases. The subsequent analysis takes the Proposed Action (both the action itself and the affected area[s]) into account as part of a holistic view of the noise environment and how the Proposed Action may cause changes to occur to that environment.

19.h. Cumulative Impacts on Biological Resources

Based on information obtained during the Section 7 consultation process and during the public comment period, additional information pertaining to potential impacts on biological resources has been incorporated into Section 4.8. Similarly, a revised cumulative impacts analysis reflects these changes and can be found in Section 5.4.8.

Because the Proposed Action does not have direct impacts on ocean acidification and in-water noise, neither topic is included in the cumulative impact analysis. Please see Section 4.8.2.2, which discusses potential impacts to marine species, and Section 4.9.2, which discusses water quality concerns.