

3 Existing Environment

3.1 Introduction

This section describes the existing environmental resources at NAS Whidbey Island and in the immediate surrounding area that could be affected by the proposed action and alternatives, including the No Action Alternative. Resources evaluated include land use and coastal zone management, threatened and endangered species and other biological resources, water resources, noise, air quality, cultural resources, the regional economy, and environmental management. The resources described here provide baseline information that can be used to compare and evaluate potential impacts on the human environment that may result from implementation of the alternatives.

The CEQ regulations implementing NEPA require that a NEPA document “succinctly describe the environment of the area to be affected or created by the alternatives under consideration” (40 CFR 1502.15). The descriptions of the existing environmental resources that could be affected by implementation of the proposed action and its alternatives need be no longer than necessary. Consistent with this guidance, Navy policy directs that a NEPA document should exclude material not directly applicable to the expected impact. Therefore, the discussion of the existing environment focuses on those resource areas where there is a potential for significant impact.

Under the action alternatives, the existing environment may be affected by the following components of the proposed action:

- Aircraft operations
- New construction and renovation
- Personnel relocation and transition.

The number of additional personnel stationed or employed at NAS Whidbey Island would be 91 under Alternative 1 and 311 under Alternatives 2 or 3. Because the change in personnel would be minor in the context of the regional setting of the City of Oak Harbor and Island County, the following existing environmental resources are not addressed in detail in this EA because implementation of the proposed action and its alternatives would have a negligible effect or no effect on them.

Community Services. Changes to the existing community services, including fire protection, emergency, security, and medical services are not anticipated under any of the action alternatives for NAS Whidbey Island or the surrounding communities. All of the action alternatives project a minor increase in the number of personnel stationed or employed at NAS Whidbey Island (91 personnel under Alternative 1 and 311 under Alternatives 2 or 3) and any potential impact associated with the change in the use of on-station or residential community services would be negligible.

Transportation. Under all alternatives the number of personnel stationed or employed at NAS Ault Field would change slightly, with a corresponding negligible change in the number of personally owned vehicles, the amount of traffic, and the miles traveled. Thus, no additional congestion, traffic, or transportation requirements are anticipated on local roads or around the base.

Socioeconomics (Regional Population, Housing, Business Impacts, Property Values, and Tourism). The minor increase of 91 personnel under Alternative 1 and 311 under Alternatives 2 or 3 would result in a corresponding minor increase in regional population and demand for housing. NAS Whidbey Island has been located in this community for decades, and the local housing market routinely accommodates minor increases and decreases in population associated with transient military personnel. Therefore, no impacts are expected and population and housing is not discussed further.

Real 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, and amenities). 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. No definitive federal standards exist for quantifying the impact of aircraft and given the dynamic nature of the real estate market and the varying degree to which any combination of factors may affect the value of a particular property, it will not be possible to quantify how a potential change in aircraft noise may affect property values, so these topics are not discussed further.

Infrastructure and Utilities. The minor increase in personnel would result in a corresponding minor increase in water use, wastewater discharge, power use, and solid waste generation. These minor changes would have no effect on the current capacities of existing infrastructure and utilities. No impacts on water quality from stormwater discharge due to new construction would be expected, given the small area of new impervious surface, implementation

of on-site BMPs such as those contained in the *Stormwater Management Manual for Western Washington* (Washington Department of Ecology 2005), e.g., containing potential stormwater runoff on site, using existing on-site stormwater detention facilities, and complying with existing permit conditions.

Vegetation. The proposed facility modifications would occur in a developed portion of Ault Field. New construction would be located on previously disturbed areas or areas of maintained ornamental grass typical of industrial and urban areas; so there would be no impact on unique vegetation or habitat. Approximately 9,200 square feet of maintained ornamental grass would be removed to construct the flight simulator building addition. Additional maintained ornamental grass around this building would be disturbed by construction equipment; at completion of construction, this area would be replanted or landscaped.

Soils. The proposed facility modifications would occur in a developed portion of Ault Field where the soils have been previously disturbed. While construction (i.e., clearing, grading, and movement of equipment and materials) would expose soils to wind and stormwater erosion, standard soil erosion and sedimentation control techniques such as the use of silt fencing and other measures contained in the *Stormwater Management Manual for Western Washington* (Washington Department of Ecology 2005) will mitigate these impacts to negligible levels.

3.2 Airspace and Airfield Operations

3.2.1 Airspace

Under the National Airspace System, the airspace above Ault Field is designated as Class C airspace. NAS Whidbey Island Class C airspace is: 1) airspace extending upward from the surface to and including 4,000 feet above mean sea level (msl) within a 5-mile radius of Whidbey Island NAS; 2) airspace that extends upward from 1,300 feet above msl to and including 4,000 feet above msl within a 10-mile radius of the airport from the 050° bearing from the airport clockwise to the 345° bearing from the airport; and 3) airspace extending upward from 2,000 feet above msl to and including 4,000 feet above msl within a 10-mile radius of the airport from the 345° bearing from the airport clockwise to the 050° bearing from the airport.

This Class C airspace area is in effect during the specific days and hours of operation of the Whidbey Island NAS air traffic control (ATC) facility as established in advance by a Notice to Airmen. The effective dates and times will thereafter be continuously published in the Airport/Facility Directory.

In addition to the Class C airspace, the NAS Whidbey Island radar ATC facility is responsible for the safe, orderly, and expeditious flow of both civil and military air traffic operating within 2,200 square miles of Class E airspace. The vertical limits of the airspace are defined by two layers—an upper layer with a 10-nm radius over a bottom layer with a 5-nm radius. The floor of the upper layer is 1,200 feet above msl, with a ceiling of 4,000 feet above msl. The bottom layer extends from the surface to 1,200 feet above msl. The NAS Whidbey Island radar ATC facility is responsible for the safe, orderly, and expeditious flow of air traffic operating within the 2,100 square miles of airspace.

3.2.2 Airfield Operations

Ault Field includes both fixed- and rotary-wing aircraft operations. NAS Whidbey Island provides land-based support and training for all of the Navy's active duty EA-6B Prowler and EA-18G Growler aircraft squadrons and the Pacific Fleet P-3C (being replaced by the P-8A Multi-mission Maritime Aircraft [MMA] beginning in 2012). The air station serves as host to two air wings (Electronic Attack Wing Pacific and Patrol and Reconnaissance Wing Ten), a Fleet Logistics Support squadron, and NAS Whidbey Island Search and Rescue. The EA-18G and P-3C (to be replaced by P-8A MMA) aircraft platforms are the predominant aircraft flown at NAS Whidbey Island and are operated by VAQ Wing Pacific and Patrol and Reconnaissance Wing Ten, respectively. The station also supports a Navy Reserve P-3C and C-9 squadron in addition to the air station's MH-60S search-and-rescue helicopters.

The airfield at Ault Field consists of two intersecting runways, Runway 07/25 and Runway 14/32. Both runways are 8,000 feet long and 200 feet wide. Ault Field is open seven days per week, 24 hours per day. The prevailing wind direction and noise abatement procedures result in Runways 25 and 14 being the most frequently used runways at the station. Approximately 44% of the airfield operations are assigned to Runway 25, and 36% of the airfield operations are assigned to Runway 14. Runways 07 and 32 are used less frequently; 13% of the airfield operations are assigned to Runway 07, and 7% are assigned to Runway 32.

Pilots perform approximately 70,557 flight operations (i.e., any takeoff or landing) annually at Ault Field (Wyle 2012). According to NAS Whidbey Island ATC personnel, operation types include departures (from brake release), full-stop arrivals (either "straight-in" or from an overhead-break), touch-and-go (T&G) patterns, and ground control approach (GCA) operations.

A flight operation refers to any takeoff or landing. The takeoff and landing may be part of a training maneuver (or pattern) associated with the air station runway or may be associated with a departure or arrival of an aircraft to or from defense-related SUA. Certain flight operations (e.g., GCA, T&G, etc.) are conducted as patterns. A pattern consists of a takeoff and a landing operation.

Basic flight operations at NAS Whidbey Island are:

Departure. An aircraft taking off to a local training area, a non-local training area, or as part of a training maneuver (e.g., T&G).

Straight-In/Full-Stop Arrival. An aircraft lines up on the runway centerline, descends gradually, lands, comes to a full stop, and then taxis off the runway.

Overhead Break Arrival. An expeditious arrival using visual flight rules. An aircraft approaches the runway 500 feet above the altitude of the landing pattern. Approximately halfway down the runway, the aircraft performs a 180-degree turn to enter the landing pattern. Once established in the pattern, the aircraft lowers landing gear and flaps and performs a 180-degree descending turn to land on the runway.

Ground-Controlled Approach Box. A radar or “talk down” approach directed from the ground by ATC personnel. ATC personnel provide pilots with verbal course and glide-slope information, allowing them to make an instrument approach during inclement weather. The GCA Box is counted as two operations—the landing is counted as one operation, and the takeoff is counted as another.

Touch-and-Go Operation. An aircraft lands and takes off on a runway without coming to a full stop. After touching down, the pilot immediately goes to full power and takes off again. The T&G is counted as two operations—the landing is counted as one operation, and the takeoff is counted as another.

Field Carrier Landing Practice (FCLP). An aircraft practices simulated carrier landings. FCLPs are required training for all pilots before landing on a carrier. The number of FCLPs performed is determined by the length of time that has elapsed since the pilot’s last landing on a carrier. The FCLP is counted as two operations—the takeoff is counted as one, the landing is counted as another. (Because the Expeditionary VAQ Squadrons will not be based aboard aircraft carriers, they will not be performing FCLPs at OLF Coupeville.)

The baseline scenario for this study is defined as the operations during CY2011. As CY2011 was not yet complete when the analysis for this study began, the baseline scenario (i.e.,

CY2011) was derived from a six-year average of the NAS Whidbey Island Air Traffic Activity Reports for CY2005 through CY2010. Baseline flight operations for Ault Field total 70,557 (see Table 3-1). The EA-6B is currently being replaced by the EA-18G. The Navy provided the numbers of NAS Whidbey Island-based Prowler and Growler aircraft for CY2011 as 40 and 39, respectively. This ratio was used to adjust the proportion of Prowler and Growler operations for the baseline scenario and represents the best available snapshot of aircraft operations while the replacement of CVW EA-6B Prowler squadrons at NAS Whidbey Island with CVW EA-18G Growler squadrons is ongoing.

As shown in Table 3-1, under baseline conditions, airfield operations at Ault Field would be predominantly EA-18G, EA-6B, and P-3C operations, which would account for 26%, 27%, and 45%, respectively, of the total airfield operations (Wyle 2012). Approximately 9% (6,676 operations) of the total annual operations occur at night (2200 to 0700)

Final Environmental Assessment

Transition of Expeditionary EA-6B Prowler Squadrons to EA-18G Growler

Table 3-1 2011 Modeled Annual Baseline Operations at Ault Field

Baseline Flight Operations for NAS Whidbey Island (Ault Field)																
Aircraft Type	VFR Departure			Inter-facility Departure to Coupeville												
	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total					Number of Based Aircraft					
EA-18G	1,796	117	1,913	179	11	190				EA-18G		39				
EA-6B ⁽³⁾	1,842	120	1,962	184	11	195				EA-6B		40				
P-8A	-	-	-	-	-	-										
P-3C	7,388	210	7,598	-	-	-				Operations Totals						
C-9	196	106	302	-	-	-				Ault Field			70,557			
Transient ⁽²⁾	152	82	234	-	-	-										
Total	11,374	635	12,009	363	22	385										
Aircraft Type	VFR Straight-in Arrival			IFR Straight-in Arrival			TACAN Arrival			Overhead Break Arrival			Inter-facility Arrival from Coupeville			
	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	
EA-18G	642	17	659	-	-	-	207	17	224	937	93	1,030	179	11	190	
EA-6B ⁽³⁾	658	18	676	-	-	-	212	18	230	961	95	1,056	184	11	195	
P-8A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
P-3C	5,173	147	5,320	1,108	31	1,139	1,108	31	1,139	-	-	-	-	-	-	
C-9	196	106	302	-	-	-	-	-	-	-	-	-	-	-	-	
Transient ⁽²⁾	152	82	234	-	-	-	-	-	-	-	-	-	-	-	-	
Total	6,821	370	7,191	1,108	31	1,139	1,527	66	1,593	1,898	188	2,086	363	22	385	

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Transition of Expeditionary EA-6B Prowler Squadrons to EA-18G Growler

Table 3-1 2011 Modeled Annual Baseline Operations at Ault Field

Baseline Flight Operations for NAS Whidbey Island (Ault Field)

Aircraft Type	Touch and Go ⁽¹⁾			FCLP ⁽¹⁾			Depart and Re-enter Pattern ⁽¹⁾			GCA Pattern ⁽¹⁾			Total			% of Total Operations
	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	Day (0700 - 2200)	Night (2200 - 0700)	Total	
EA-18G	4,000	189	4,189	6,932	1,448	8,380	104	8	112	888	800	1,688	15,864	2,711	18,575	26.3%
EA-6B ⁽³⁾	4,103	194	4,297	7,109	1,486	8,595	106	8	114	910	820	1,730	16,269	2,781	19,050	26.9%
P-8A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-3C	11,947	227	12,174	-	-	-	-	-	-	4328	162	4,490	31,052	808	31,860	45.2%
C-9	-	-	-	-	-	-	-	-	-	-	-	-	392	212	604	<1.0%
Transient ⁽²⁾	-	-	-	-	-	-	-	-	-	-	-	-	304	164	468	<1.0%
Total	20,050	610	20,660	14,041	2,934	16,975	210	16	226	6,126	1,782	7,908	63,881	6,676	70,557	100

Notes:

(1) One circuit counted as two operations (1 takeoff and 1 landing)

(2) Modeled as P-3C

(3) EA-6B includes three Expeditionary Squadrons

Key:

- FCLP = Field Carrier Landing Practice
- GCA = Ground Control Approach
- IFR = Instrument Flight Rules
- TACAN = Tactical Air Navigation
- VFR = Visual Flight Rules

Table 3-2 lists the Expeditionary VAQ squadrons 2011 annual baseline operations.

Table 3-2 Expeditionary VAQ 2011 Annual Baseline Operations at Ault Field, NAS Whidbey Island

	Expeditionary VAQ Air Operations (Baseline)	
	EA-6B VAQ Squadrons	EA-18G VAQ Squadrons
# Aircraft	12	0
Departures	589	0
Inter-facility Departures	0	0
Straight-in Arrivals	272	0
Overhead Break Arrivals	317	0
Inter-facility Arrivals	0	0
Touch & Go	1,289	0
FCLP	0	0
Depart-Re-enter	34	0
GCA pattern	519	0
Total	3,020	0
Maintenance Run-Ups		
Water Wash	133	0
Low Power	320	0
High Power	3	0

Source: Wyle 2012

3.2.3 Aircraft Safety

Safety is a priority for the Navy. The FAA is responsible for ensuring the safe and efficient use of U.S. airspace by military and civilian aircraft and for supporting national defense requirements. To fulfill these requirements, the FAA has established safety regulations, airspace management guidelines, a civil-military common system, and cooperative activities with the DOD. In addition, the Navy has developed guidance on airfield safety zones, flight rules, air traffic control procedures, and safety procedures.

To complement flight training, all DON pilots use state-of-the-art simulators. Simulator training includes flight operations and comprehensive emergency procedures, which minimizes risks associated with mishaps due to pilot error. Additionally, highly trained maintenance crews routinely inspect each aircraft in accordance with Navy regulations, and maintenance activities are monitored by senior technicians to ensure aircraft are equipped to withstand the rigors of operational and training events safely.

The primary safety concern with regard to military aircraft training operations is the potential for aircraft mishaps to occur. Aircraft mishaps could be caused by mid-air collisions

with other aircraft or objects, weather difficulties, mechanical failures, pilot error, or bird/wildlife-aircraft strike hazards (BASH). They are classified as Class A, B, or C according to the severity of injury to individuals and total property damage, with the most severe being a Class A (\$2 million or more in property damage, aircraft destroyed, or fatality or permanent total disability) and the least severe a Class C (\$50,000 and \$500,000 in property damage and/or nonfatal injury) (Naval Safety Center 2012).

NAS Whidbey Island maintains emergency and mishap response plans to guide responses to aircraft accidents. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on- or off-base. Response would normally occur in two phases. The initial response focuses on rescue, evacuation, fire suppression, safety, elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. The second phase is the mishap investigation.

3.3 Noise

Noise is generally described as unwanted sound. A sound is regarded as noise when it interferes with normal activities such as sleep or conversation or when it is subjectively judged to be annoying. Noise analysis thus requires a combination of the physical description of sound produced by an activity and an identification of the potential responses to it.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium such as air. The measurement and human perception of sound involves three basic physical characteristics: amplitude, frequency, and duration. Amplitude is a measure of the strength of the sound and is directly measured in terms of the pressure of the sound wave. The greater the sound pressure, the more energy carried by the sound and, generally, the louder the perception of that sound. The second important physical characteristic of sound is frequency, which is the number of times per second the air vibrates. Frequency is sensed as pitch; low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches. The third important characteristic of sound is duration, the length of time the sound can be detected.

The loudest sounds that the human ear can hear have an acoustic energy a trillion times that of sounds that can barely be detected. Because of this vast range, using a linear scale to represent the intensity of sound becomes very unwieldy. Sound is therefore usually represented on a logarithmic scale with a unit called the decibel (dB). Such a representation is called a sound

level. A sound level of slightly above 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB; sound levels above 120 dB begin to be felt by the human ear as discomfort (Wyle 2012).

The minimum change in sound level that the average human ear can detect is about 3 dB. On average, a person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness, and this relation holds true for both loud and quiet sounds. A decrease in sound level of 10 dB actually represents a 90% decrease in sound intensity but only a 50% decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses) (Wyle 2012).

In terms of frequency, sound levels are adjusted to the "A-weighted" frequency scale (dBA), which reflects the human ear's sensitivity to different frequencies of sound. A-weighting is assumed for all sound level descriptors in this document.

Aircraft noise consists of two major types of sound events: aircraft takeoffs and landings, and engine maintenance operations, or run-ups. The former can be described as intermittent sounds and the latter as continuous. Noise levels from flight operations exceeding ambient background sound levels typically occur beneath main approach and departure corridors, or in local air traffic patterns around the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft in flight gain altitude, their noise contribution drops to lower levels, often becoming indistinguishable from background noise.

Noise potentially becomes an issue when it interferes with our daily activities. Ambient background noise in metropolitan, urbanized areas typically varies from 60 to 70 dB and can be as high as 80 dB or greater; quiet suburban neighborhoods experience ambient noise levels of approximately 45 to 50 dB (U.S. Environmental Protection Agency [EPA] 1978).

Since flight operations dominate at an airfield, the resulting noise is highly variable. This variability is best assessed by time-average sound level metrics such as the day-night average sound level (DNL). DNL is a composite metric that averages all noise events for a 24-hour period, with a 10 dB penalty applied to nighttime events after 2200 and before 0700. It is an average quantity, mathematically representing the continuous A-weighted sound level that would be present if all of the variations in sound level that occur over a 24-hour period were smoothed out so as to contain the same total sound energy. It is a composite metric accounting for the maximum noise levels, the duration of the events (sorties or operations), and the number of events that occur over an average annual day.

The 10-dB penalty in DNL is added to noise events that take place between 2200 and 0700 the following morning. This 10-dB penalty accounts for the added intrusiveness of sounds during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours. DNL does not represent the sound level heard at any particular time, but is an expression of community reaction to noise.

The DNL for a community is depicted as a series of contours that connect points of equal value, usually in 5-dB increments. Calculated noise contours do not represent exact scientific measurements. The area between two specific contours is known as a noise zone. The noise zones used in this study range from a low of 65 dB to more than 90 dB.

Individual response to noise levels varies and is influenced by many factors, including:

- The activity the individual is engaged in at the time of the noise
- General sensitivity to noise
- Time of day
- Length of time an individual is exposed to a noise
- Predictability of noise
- Average temperature.

A small change in dBA would not generally be noticeable. As the change in dBA increases, individual perception is greater, as shown in Table 3-3.

Table 3-3 Subjective Responses to Changes in A-Weighted Decibels

Change	Change in Perceived Loudness
1 dB	Requires close attention to notice
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic; twice or half as loud
20 dB	Striking; a four-fold change

Source: Wyle 2012

In general, scientific studies and social surveys have found a high correlation between the percentages of groups of people highly annoyed by a noise and the level of average noise exposure, measured in DNL (EPA 1978; Schultz 1978; Fidell et al. 1991). The DNL has become the standard metric used by many federal and state governmental agencies and organizations such as the EPA and the FAA, for assessing aircraft noise (see Figure 3-1).

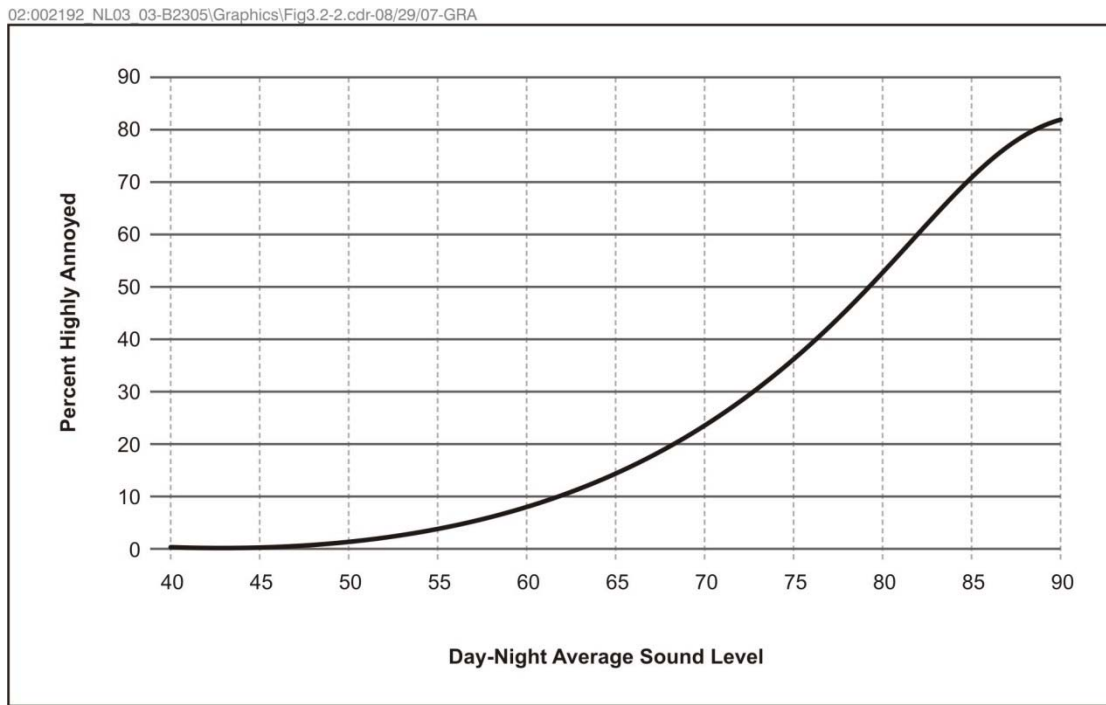


Figure 3-1 Influence of Sound Level on Annoyance

In addition to presenting DNL values, which capture the average noise environment over a period of time for numerous events, sound exposure levels (SELs) are used as a supplemental metric in this study to quantify the noise exposure related to a single event and to help describe the different aspects of noise. However, the DNL metric remains the primary accepted metric for measuring the impacts on the community from aircraft noise.

SEL represents both the intensity (loudness) of a sound and its duration. Individual time-varying noise events (e.g., aircraft over flights) have two main characteristics: a sound level that changes throughout the event, and a period of time during which the event is heard. SEL provides a measure of the net exposure of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft flyover, SEL would include both the maximum noise level and the lower noise levels produced during onset and recess periods of the overflight. The SEL describes the noise associated with a single event at a specific location. Aircraft noise varies from event to event according to aircraft type and model, aircraft configuration, engine power settings, aircraft speed, weather conditions, and distance between the observer and the aircraft.

Another aspect of noise impacts to a community is the potential for noise-induced hearing loss. The 1982 EPA Guidelines specifically address the criteria and procedures for assessing noise-induced hearing loss in terms of the noise-induced permanent threshold shift (NIPTS), a quantity that defines the permanent change in hearing level, or threshold, caused by exposure to noise (EPA 1982). Numerically, the NIPTS is the change in threshold averaged over the frequencies 0.5, 1, 2, and 4 kiloHertz (kHz) that can be expected from daily exposure to noise over a normal working lifetime of 40 years, with the exposure beginning at an age of 20 years. A grand average of the NIPTS over time (40 years) and hearing sensitivity (10th to 90th percentiles of the exposed population) is termed the average NIPTS. A 2009 DOD policy directive requires that hearing loss risk at military airbases be estimated for the at-risk population, defined as the population exposed to a DNL greater than or equal to 80 dB (DOD 2009). Specifically, DOD components are directed to “use the 80 DNL noise contour to identify populations at the most risk of potential hearing loss.” The average NIPTS that can be expected for noise exposure as measured by the DNL metric is noted in Table 3-4.

Table 3-4 Average NIPTS and 10th Percentile NIPTS as a Function of DNL

DNL	Average NIPTS dB*	10 th Percentile NIPTS dB*
80-81	3.0	7.0
81-82	3.5	8.0
82-83	4.0	9.0
83-84	4.5	10.0
84-85	5.5	11.0
85-86	6.0	12.0
86-87	7.0	13.5
87-88	7.5	15.0
88-89	8.5	16.5
89-90	9.5	18.0

Notes: *Rounded to the nearest 0.5 dB

For example, for a noise exposure of 80 dB DNL, the expected lifetime average NIPTS is 3.0 dB, or 7.0 dB for the 10th percentile (10% most sensitive population). Since hearing loss is a function of the actual sound levels rather than annoyance levels, characterizing the noise exposure in terms of DNL usually overestimates the assessment of hearing loss risk because DNL includes a 10-dB weighting factor for aircraft operations occurring between 2200 and 0700.

Existing Noise Environment

Aircraft operations and ground engine-maintenance run-ups are the primary source of noise at NAS Whidbey Island. In-frame and out-of-frame engine maintenance run-ups are used to test the engine at various power settings and durations. In-frame engine maintenance run-ups designated for low- or high-power testing are conducted at several locations at NAS Whidbey Island. Out-of-frame engine testing is conducted at an engine test cell in Building 2525 and next to Building 2765 (U.S. Navy 2005a). Pre-flight engine run-ups are generally not conducted for the types of aircraft stationed at NAS Whidbey Island.

Baseline flight operations at NAS Whidbey Island are dominated by the EA-6B, EA-18G, and P-3C aircraft (see Table 3-1). However, the EA-6B and EA-18G contribute approximately 98% of the acoustic energy to the noise environment at NAS Whidbey Island (i.e., the EA-6B and EA-18G are the loudest aircraft operating at NAS Whidbey Island) (Wyle 2012). The baseline noise zones for NAS Whidbey Island are presented on Figure 3-2.

Even though this EA analyzes only the change in aircraft for the Expeditionary VAQ squadron, the modeled 2011 baseline contains additional EA-6B aircraft operations. The replacement of CVW EA-6B Prowler squadrons at NAS Whidbey Island with CVW EA-18G Growler squadrons as analyzed in the *Environmental Assessment for Replacement of EA-6B Aircraft with EA-18G Aircraft at Naval Air Station Whidbey Island, Washington* (U.S. Navy 2005) is not yet complete. As of CY2011, a total of 39 EA-18G and 40 EA-6B aircraft were stationed at NAS Whidbey Island, which reflects the most accurate mix of aircraft to support the NAS Whidbey Island 2011 baseline noise contours.

The off-station area and the estimated 2010 population in the modeled baseline noise zones for NAS Whidbey Island are noted in Table 3-5.

The 65-dB DNL contour extends nearly to the eastern shore of the mainland across Skagit Bay, where EA-18G aircraft flying GCA descend to 1,000 feet above ground level (agl). The 65-dB DNL contour otherwise extends over land approximately 3 to 4 miles from the center of the airfield, the result of overlapping pattern operations. The 80-dB and 85-dB DNL contours extend approximately 1.7 miles and 3,400 feet to the east outside the station boundary, respectively, due to the arrival portion of EA-6B and EA-18G T&G patterns on Runway 25. The greater-than-85-dB noise zone is almost entirely contained within the base boundary, with one or two residential structures along W. Frostad Road at the eastern end of Runway 07.

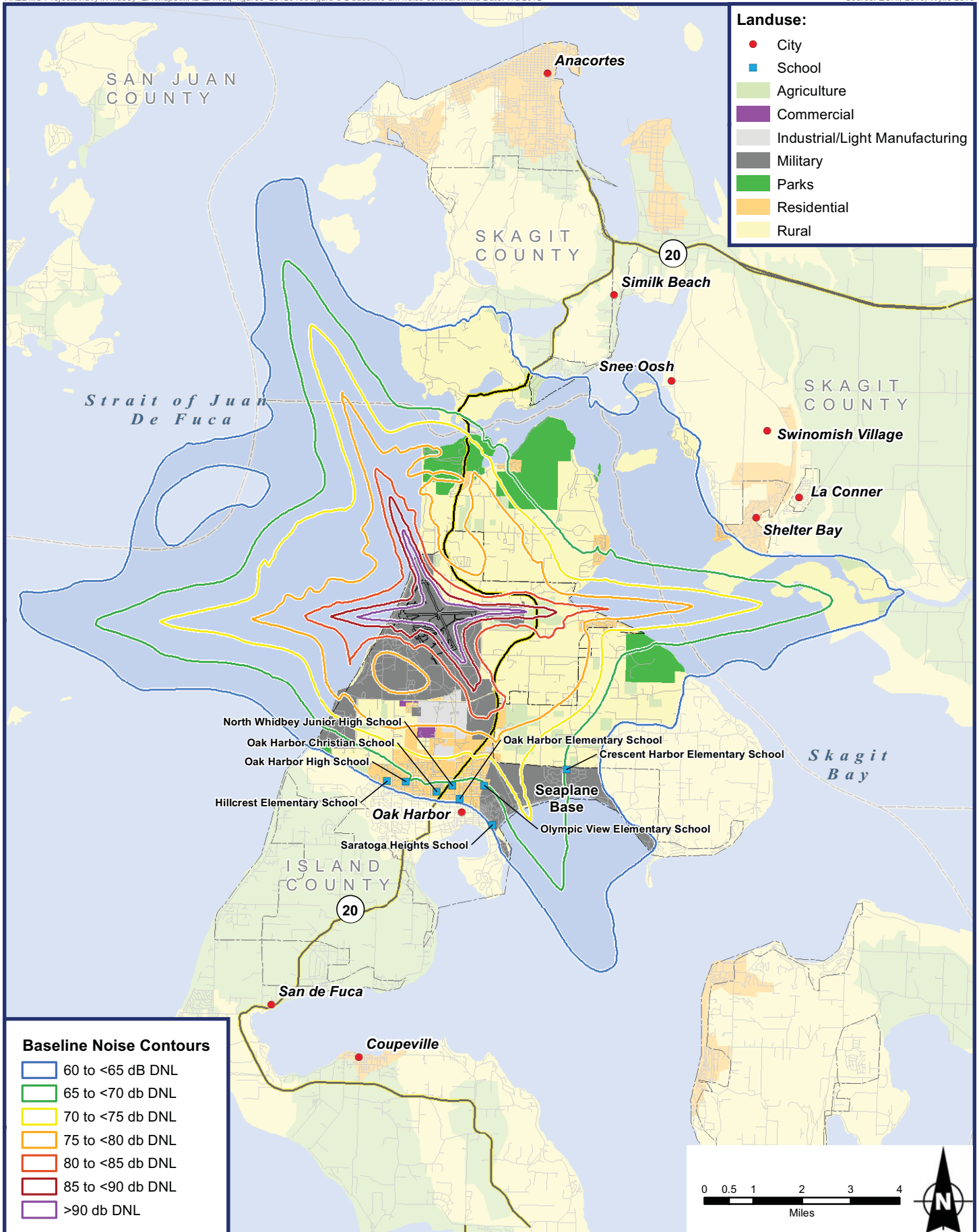


Figure 3-2
 2011 Baseline DNL Noise Contours
 Transition of Expeditionary EA-6B Prowler Squadrons to
 EA-18G Growler at NAS Whidbey Island, Washington

**Table 3-5 Area and Estimated Population within 2011
Baseline Noise Contours at NAS Whidbey Island**

Noise Zone (dB DNL)	Area (Acres)	2010 Off-Station Population ¹
65 to 70 dB	12,087	4,743
70 to 75 dB	10,657	2,843
75 to 80 dB	9,489	2,789
80 to 85 dB	2,544	209
85 to 90 dB	1,110	34
>90 dB	849	1
Total	36,736	10,619

Notes:

¹ Census data are reported by blocks. The population shown is a proportion of the census block based on the geographic area of the noise zone. These data should be used for comparative purposes only and are not considered actual numbers within the noise zones.

Key:

dB = Decibel.

DNL = Day-night average sound level.

Most of the land surrounding Ault Field and in the existing noise zones is forested and agricultural/open fields, scattered rural residential land, and scattered residential subdivisions at higher densities (see Sections 3.1.1 and 3.4 and Table 3-6). No schools or religious institutions are located within the greater-than-65-dB DNL. In addition, portions of Deception Pass State Park, north of Ault Field, are located within the 65- to 70-dB, 70- to 75-dB, and greater-than-75-dB DNL noise zones around Ault Field.

3.4 Land Use

3.4.1 Installation Land Use

NAS Whidbey Island occupies 4,337 acres on the north end of Whidbey Island in Island County, Washington. The air station is bordered on the south by the City of Oak Harbor and on the west by the Strait of Juan de Fuca. Approximately 1,040 acres (24%) of Ault Field has been developed. The remaining land area is undeveloped and supports various vegetation communities and runway clear zones.

The airfield, Ault Field, occupies the northeast portion of NAS Whidbey Island and has two 8,000-foot intersecting runways, Runways 07/25 and 14/32. Aircraft operations facilities are located southwest of the runways within the flight line and include aircraft parking ramps, taxiways, aircraft maintenance hangars, a passenger terminal, an air traffic control tower, aircraft

maintenance hangars, and various other support facilities. The project area for construction projects associated with the proposed action is entirely within the developed portion of the flight line. Facilities supporting other air station functions, including housing and administration, operational support, community support, and recreational facilities, are located outside the airfield.

The air station is fenced, except for the Strait of Juan de Fuca shoreline. Access to the air station is restricted to military, civil service, contractor personnel, and authorized visitors.

3.4.2 Regional Land Use

Land adjacent to NAS Whidbey Island within Island County is rural, with large tracts of undeveloped forestland, agricultural land, and scattered residential subdivisions at higher densities. Other land uses in the vicinity of NAS Whidbey Island include:

- A mixture of residential, light industrial, and commercial uses south of NAS Whidbey Island in the City of Oak Harbor
- Commercial and light industrial uses along State Route 20, which runs along the eastern boundary of the air station
- Deception Pass State Park to the north of the air station and Joseph Whidbey State Park to the southwest
- Various public, private, and Navy-owned marinas, boat launches, campgrounds, beaches, hiking trails, and golf courses.

3.4.3 Land Use Controls

Development within and around NAS Whidbey Island is controlled, guided, or influenced by the following plans, programs, and policies:

- The NAS Whidbey Island Airfield Recapitalization Plan
- The 2004 NAS Whidbey Island Activity Overview Plan
- The NAS Whidbey Island Integrated Cultural Resources Management Plan (ICRMP)
- The NAS Whidbey Island 1996 Integrated Natural Resources Management Plan (INRMP)
- The Navy and Marine Corps AICUZ Programs
- The Island County 1998 Comprehensive Plan (updated in 2008) and Zoning Code
- The City of Oak Harbor 2009 Comprehensive Plan and Zoning Code.

Airfield Recapitalization Plan. In 2002, the Navy finalized the NAS Whidbey Island Airfield Recapitalization Plan. The purpose of the plan is to define long-term (25 to 50 years) needs for structural improvements and replacements within the airfield complex; to develop an implementation strategy to meet those needs; and to identify areas for future flight line expansion.

The Airfield Recapitalization Plan is a component of the Navy Region Northwest's Regional Overview Plan for the Puget Sound Regional Shore Infrastructure Plan. This plan addresses both a no-growth and a 15% growth scenario at NAS Whidbey Island associated with consolidation of regional facilities. In either case, this plan involves the VAQ aircraft squadrons remaining at NAS Whidbey Island.

NAS Whidbey Island Activity Overview Plan. The NAS Whidbey Island 2004 Activity Overview Plan is a comprehensive land use and facilities plan to support the long-range vision of NAS Whidbey Island. The Activity Overview Plan includes an analysis of the air station's potential airframe and squadron-loading scenarios, including replacement of the EA-6B with the EA-18G aircraft; existing conditions and future operational needs of the mission-critical, mission-support, and personnel-support departments; and existing land use constraints and potential areas for development.

The recommendations of the Activity Overview Plan are summarized in a Strategic Action Plan that identifies near-, medium-, and long-term construction, renovation, and demolition projects, and policy and planning actions. Among these recommendations is the demolition of surplus infrastructure and relocation of inappropriately sited functions and facilities. In addition, the Strategic Action Plan recommends that the efficiency of existing hangar utilization be evaluated to increase operational efficiency and maximize hangar space available for future uses.

Integrated Cultural Resources Management Plan, NAS Whidbey Island, Washington. The Navy has prepared an ICRMP that summarizes the archaeological and historic surveys at Ault Field, Seaplane Base, OLF Coupeville, Lake Hancock, and Northwest Training Range (NWTR) Boardman that have been completed and that identifies management actions in compliance with Section 106 and Section 110 of the NHPA.

NAS Whidbey Island Integrated Natural Resources Management Plan. NAS Whidbey Island prepared an INRMP in 1996, which is currently being updated in compliance with DOD Instruction 4715.3 and the Sikes Act (16 U.S.C. 670a, *et seq.*) (EA EST 1996). The INRMP is a management tool for restoring, protecting, preserving, and properly using natural

resources within the air station that are compatible with and in support of the military mission. The INRMP identifies land, water, plant, fish, and wildlife resources on Ault Field, Seaplane Base, Lake Hancock, and OLF Coupeville and provides recommendations on how to manage natural resources at each location.

AICUZ Program. The AICUZ Program was established in the 1970s by the DOD to analyze operational training requirements and to address communities' concerns about aircraft noise and accident potential. The purpose of the AICUZ Program is to achieve compatibility between air stations and neighboring communities by:

- Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations
- Protecting Navy and Marine Corps installation investment by safeguarding the installation's operational capabilities
- Reducing noise impacts caused by aircraft operations while meeting operational, training, and flight safety requirements
- Informing the public about the AICUZ program and seeking cooperative efforts to minimize noise and potential aircraft accident impacts.

An AICUZ study analyzes aircraft noise, accident potential, land-use compatibility, and operational procedures and provides recommendations for compatible development near air stations. Federal, state, regional, and local governments are encouraged to adopt guidelines promoting compatible development. The AICUZ study defines the noise zones and accident potential zones (APZs) that represent the area where land-use controls are needed to protect the health, safety, and welfare of those living near the air station and to preserve the military flying mission.

Noise. Under the AICUZ Program, noise zones are identified as the area between the calculated noise contours, based on operations occurring on an average annual day or average busy day. For land-use planning purposes, the noise zones are grouped into three zones. Noise Zone 1 (less than 65 dB DNL) is generally considered an area of low or no noise impact. Noise Zone 2 (65 to 75 dB DNL) is an area of increased noise impact where some land use controls are required. Noise Zone 3 (greater than 75 dB DNL) is the highest impacted area and requires the greatest degree of land use control.

Accident Potential Zones (APZs). The number and type of airfield operations are also used as the basis for identifying APZs around an airfield. While the likelihood of an aircraft mishap is remote, the Navy identifies areas of accident potential to assist in land use planning.

APZs are areas where an aircraft mishap is most likely to occur and is delineated based on historical data and departure, arrival, and pattern flight tracks on and near the airfield runways. The Navy recommends that local planning agencies plan for and construct developments that concentrate large numbers of people—such as apartments, churches, and schools—outside the APZs.

APZs include three restricted areas, with the areas nearest the runways having the most restrictions. These areas, the Clear Zone, APZ 1, and APZ 2, are configured as follows:

- **Clear Zone.** The Clear Zone extends 3,000 feet beyond the end of the runway; it measures 1,500 feet wide at the end of the runway and 2,284 feet wide at its outer edge.
- **APZ 1.** APZ 1 extends 5,000 feet beyond the Clear Zone, with a width of 3,000 feet at its outer edge. APZ 1 is typically rectangular, although it may curve to conform to the predominant flight track.
- **APZ 2.** APZ 2 extends 7,000 feet beyond APZ 1, with a width of 3,000 feet. This zone is typically rectangular, although it, too, may conform to the curve of the predominant flight track, such as the FCLP flight track.

Although ultimate control over land use and development in the vicinity of military facilities is the responsibility of local governments, the Navy recommends, through its AICUZ Program, that localities adopt programs, policies, and regulations to promote compatible development where appropriate and feasible near Navy and Marine Corps air installations. Such land-use recommendations are intended to serve as guidelines; they are based on the assumption that noise-sensitive uses (e.g., houses, churches, hospitals, amphitheaters, etc.) should be located outside the high-noise zones, and people-intensive uses should not be located within APZs. The purpose of the Navy's land-use recommendations is not to preclude productive use of land around Navy and Marine Corps air installations, but to recommend best uses of the land that are protective of human health, safety, and welfare. The Navy's recommendations can be implemented by ensuring that development restrictions are placed on noise-sensitive uses in high-noise zones and on people-intensive uses in APZs, as well as by fair disclosure in real estate transactions and use of sound-attenuating construction.

The NAS Whidbey Island AICUZ Program was established in 1977. This program was updated in 1986 and again in 2005 to account for changes in aircraft mix, tempo of aviation activity, and maintenance procedures. The APZs used in this EA are from the 2005 NAS Whidbey Island AICUZ update (U.S. Navy 2005a). The majority of the Clear Zones for NAS

Whidbey Island are located on the air station or offshore in the Strait of Juan de Fuca. The boundaries of APZ 1 and APZ 2 extend off-station into the local community.

Island County Comprehensive Plan. The Island County Comprehensive Plan was adopted in 1998 and updated in 2008 in accordance with the Washington State Growth Management Act. The plan was established to manage growth in the county through the year 2020. As mandated under Revised Code of Washington 36.70A.070, the elements addressed include land use, rural, housing, capital facilities, utilities, transportation, and shoreline management. Several optional elements are addressed in the plan as well, including parks, recreation and open space, natural lands, historic preservation, and water resources (Board of Island County Commissioners et al. 1998 [updated 2011]).

The Comprehensive Plan acknowledges the county's association with NAS Whidbey Island as well as the impacts associated with aircraft operations at Ault Field. The plan designates an "Airport and Aviation Safety Overlay," which recommends that future land use adjacent to Ault Field be maintained as rural and rural agricultural. These areas are designated rural and rural agricultural to encourage low-density development within the air station's noise zones.

Island County adopted the noise contours and APZs from the 2005 NAS Whidbey Island AICUZ Study, as well as adopted a closed loop APZ for FCLP pattern operations at Ault Field to implement the airport and aviation safety overlay district through the county's zoning ordinance and other elements of the Island County Code. Existing land uses and zoning are consistent with the Navy's recommendations for land uses within the APZs, although specific regulations have not yet been adopted for that purpose. However, the goals and policies in the county's Comprehensive Plan support the adoption of codes for compatible development within the APZs.

Consistent with the Comprehensive Plan for land uses impacted by aircraft operations, Island County has adopted a zoning ordinance; an airport and aircraft operations noise disclosure ordinance for property sold, rented, or leased within the noise zones around Ault Field and OLF Coupeville; and a noise-level reduction ordinance to specify minimum standards for building construction within the noise zones around Ault Field and OLF Coupeville. In addition, to help ensure the safety of aircraft operations, the county has adopted a signs and lighting ordinance that is designed to help preserve the dark skies and rural character of the county.

City of Oak Harbor Comprehensive Plan. The City of Oak Harbor Comprehensive Plan was adopted in 2003 and last updated in 2010 in accordance with the Washington State Growth Management Act. The plan was established to manage growth in the city through the

year 2020. As mandated under the Revised Code of Washington 36.70A.070, the elements addressed include land use, housing, capital facilities, utilities, transportation, and shoreline management, as well as several optional elements.

The Comprehensive Plan contains goals and policies that address the Navy's AICUZ land use compatibility recommendations and an element, "City of Oak Harbor and Naval Air Station Whidbey Island Community Cooperation," that supports growth and development compatible with operations at Ault Field. The AICUZ recommendations are implemented through the city's adopted aviation environs overlay zone, noise attenuation standards, and noise disclosure requirement in the municipal code. Land uses within the aviation environs overlay zone are designated for low-density development. The City of Oak Harbor adopted the noise contours from the NAS Whidbey Island 2005 AICUZ Study to implement the aviation environs overlay zone through the city's zoning ordinance and other elements of the municipal code. Existing land use and zoning are consistent with the Navy's recommendations for land use compatibility within the APZs, although specific regulations have not yet been adopted for that purpose. However, the goals and policies in the Comprehensive Plan support the adoption of codes for compatible development within the APZs.

3.4.4 Land Use Compatibility

To determine the compatibility of surrounding land uses with existing aircraft operations at NAS Whidbey Island, maps of the modeled 2011 baseline noise contours for the station were overlaid on the 2012 Island County zoning map. The 2011 baseline noise contours represent the best estimate of the current noise environs in the vicinity of NAS Whidbey Island and include the 2011 mix of EA-6B Prowler and EA-18G Growler aircraft operating at NAS Whidbey Island. Land-use designations within the modeled baseline 2011 noise contours were compared to the Navy/Marine Corps land use compatibility recommendations under its AICUZ Program.

Portions of the City of Oak Harbor and Island and Skagit counties are within the modeled 2011 baseline noise contours for NAS Whidbey Island (see Figure 3-2). Table 3-6 provides the total area, by land use category, within the 65- to 70-dB DNL, 70- to 75-dB DNL, and greater-than-75-dB DNL noise contours around Ault Field. According to the AICUZ guidelines, all land use categories in the less-than-65-dB DNL noise zone are considered to be compatible.

As shown in Table 3-6, approximately 97% of the land uses within the noise contours around Ault Field are considered compatible land uses, including agriculture, business park, industrial, light manufacturing, military, parks, roads, rural, rural service, and water.

Approximately 3% of the total area within the greater-than-65-dB DNL noise contour consists of residential and municipal uses (municipality, Oak Harbor residential, rural residential, and rural village), which are generally considered to be incompatible with aircraft operations.

Table 3-6 Existing Land Uses in the 2011 Baseline Noise Zones around Ault Field

Land Use	Noise Zone (acres)						Total Acres
	65 to 70 dB DNL	70 to 75 dB DNL	75 to 80 dB DNL	80 to 85 dB DNL	85 to 90 dB DNL	>90 dB DNL	
Agriculture	92	368	332	148	55	0	995
Commercial	0	57	16	1	0	0	74
Industrial/Light Manufacturing	10	120	342	0	0	0	472
Military	724	779	1,125	809	636	713	4,786
Parks	369	549	130	0	0	0	1,048
Residential	577	494	120	7	0	0	1,198
Rural	1,385	2,152	3,939	465	78	1	8,020
Forest/Open Space	403	9	0	0	0	0	412
Open Water	8,370	5,940	3,187	1,008	325	103	18,933
Total Acres (% of Total Land Use)	11,930 (33%)	10,468 (29%)	9,191 (26%)	2,438 (7%)	1,094 (3%)	817 (2%)	35,938

Source: Island County Land Use and Zoning Maps 2012; Wyle 2012

Note: Some totals may not sum exactly due to rounding.

Key:

dB = Decibel.

DNL = Day-night average sound level.

3.5 Air Quality

3.5.1 Air Quality Regulations

The Clean Air Act (CAA) is the primary federal statute governing the control of air quality. The CAA designates six pollutants as “criteria pollutants” for which National Ambient Air Quality Standards (NAAQS) have been established to protect public health and welfare. These include particles of 10 micrometers or less in diameter (PM₁₀), carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), lead, and ozone. Areas that do not meet NAAQS for criteria pollutants are designated “nonattainment areas” for that pollutant. Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided these are at least as stringent as the federal requirements. Table 3-7 summarizes the federal and state AAQS.

Table 3-7 National and Washington State Ambient Air Quality Standards

Pollutant	Federal Primary Standards		Washington State Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ¹	Same as Federal Standards	
	35 ppm (40 mg/m ³)	1-hour ¹		
Lead	0.15 µg/m ³	Rolling 3-month Average	Same as Federal Standards	
	1.5 µg/m ³ (note 2)	Quarterly Average		
Nitrogen Dioxide	0.053 ppm ^(note 3) (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Federal Standards	
	0.100 ppm	1-hour ⁴		
Particulate Matter (PM ₁₀)	150 µg/m ³	24-hour ⁵	Same as Federal Standards	
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual ⁶ (Arithmetic Mean)	Same as Federal Standards	
	35 µg/m ³	24-hour ⁷	Same as Federal Standards	
Ozone	0.075 ppm (2008 std)	8-hour ^{8,9c}	Same as Federal Standards	
	0.08 ppm (1997 std)	8-hour ^{9a,9b,9c}		
	0.12 ppm ^(note 10a,b)	1-hour (Daily Max)	0.12 ppm	1-hour (Daily Max) ^{10a}
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.02 ppm	Annual (Arithmetic Mean)
	0.14 ppm	24-hour ¹	0.10 ppm	24-hour
	75 ppb ¹¹	1-hour ¹	0.40 ppm	1-hour, more than once per year
			0.25 ppm	1-hour, more than twice per 7-day period
Total Suspended Particulate			60 µg/m ³	Annual
			150 µg/m ³	24-hour

Source: EPA 2010a; Washington State Department of Ecology 2010.

Notes:

- ¹ Not to be exceeded more than once per year.
- ² Final rule signed October 15, 2008.
- ³ The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard
- ⁴ To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective January 22, 2010).
- ⁵ Not to be exceeded more than once per year on average over 3 years.
- ⁶ To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.
- ⁷ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m³ (effective December 17, 2006).
- ⁸ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
- ^{9a} To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
- ^{9b} The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
- ^{9c} EPA is in the process of reconsidering these standards (set in March 2008).
- ^{10a} EPA revoked the [1-hour ozone standard](#) in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
- ^{10b} The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤1.
- ¹¹ Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Key:

- µg/m³ = micrograms per cubic meter.
- Max = maximum
- mg/m³ = milligrams per cubic meter
- PM_{2.5} = particulate matter 2.5 micrometers or less
- PM₁₀ = particulate matter 10 micrometers or less
- ppm = parts per million.
- ppb = parts per billion.
- std = standard

Under the General Conformity Rule, federal actions in nonattainment areas must conform to an applicable state implementation plan, and a general conformity analysis is prepared for that action. However, Island County is in attainment of the NAAQS for all criteria pollutants (EPA 2010a). Because the region is in attainment, the CAA General Conformity Rule does not apply, and a general conformity analysis and determination is not required. Mobile source emissions regulations are not applicable to this action (<http://www.epa.gov/air/genconform/faq.html>).

3.5.2 Existing Conditions

The Northwest Clean Air Agency (NWCAA), formerly the Northwest Air Pollution Authority (NWAPA), is the regional agency responsible for overseeing the state's operating permit program for Island, Skagit, and Whatcom counties. NAS Whidbey Island is the only major source of stationary emissions in Island County, although other major sources are located in Skagit and Whatcom counties. NAS Whidbey Island operates under a Title V Operating Permit approved by the NWCAA in 2005. The stationary sources regulated under the issued permit include all gasoline storage tanks; jet engine test cells; aircraft painting, cleaning, and repair operations; and boilers, furnaces, and generators. In accordance with the Title V Operating Permit, significant stationary source emissions are reported annually.

The activities associated with the proposed action that may be regulated under the Title V Operating Permit are limited to the modification and replacement of some buildings and test cell operations. Aircraft operations and personally owned vehicle emissions, as mobile sources, are not regulated by the NWCAA. However, mobile operations would result in the majority of new emissions associated with this action and have been quantified.

3.5.3 Climate Change and Greenhouse Gas Emissions

Climate change refers to any significant change in measures of climate lasting for an extended period. Climate change may result from natural factors such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; natural processes within the climate system; or from human activities that change the atmosphere's composition and/or the land surface. Global warming is an average increase in the temperature of the atmosphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human. Global climate change threatens ecosystems, water resources, coastal regions, crop and livestock production, and human health (EPA 2010b).

Many scientific studies correlate the observed rise in global annual average temperature and the resulting change in global climate patterns with the increase in greenhouse gases (GHGs) in the Earth's atmosphere. Worldwide use of fossil fuels is the primary cause of that increase (EPA 2010b). Most of our energy comes from non-renewable fossil fuels, such as oil, gas, and coal. These fuels are used primarily for electricity production and transportation. The American economy depends on energy, and our country's security is also closely intertwined with its energy use. A wisely planned sustainability policy that addresses issues of economy, conservation, and future viability will allow the United States to move toward a safer and more secure future (U.S. Department of Homeland Security 2010).

Federal agencies are required to address emissions of GHGs with analysis and emission reduction planning. Executive Order (EO) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, signed in October 2009 (*Federal Register* 2009), and the Energy Policy Act of 2005 require federal agencies to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources. Additionally, Washington Administrative Code (WAC), Chapter 173-441, establishes a mandatory GHG reporting requirement for facilities that emit 10,000 metric tons of carbon dioxide (CO₂) equivalents or more in a calendar year. A CO₂ equivalent is a metric used to compare emissions from various GHGs based upon their global warming potential.

In February 2010, the CEQ issued Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (CEQ 2010). In this guidance, the CEQ affirmed the requirements of NEPA and CEQ regulations and their applicability to GHGs and climate change impacts. The CEQ recommends that the environmental analysis and documents produced in the NEPA process should provide the decision-maker with relevant and timely information about the environmental effects of his or her decision and reasonable alternatives to mitigate those impacts. In regard to GHGs and climate change, this includes the consideration of GHG emission effects of the proposed and alternative actions and the relationship of climate change effects to the proposed action or alternatives. While GHG emissions occur locally, GHG impacts are both global in scale and cumulative over time. GHG emissions for the baseline and the proposed action are presented and assessed in Section 5, Cumulative Impacts.

3.6 Biological Resources

3.6.1 Wildlife

The flight line area at Ault Field currently contains paved surfaces (Hangar 10 and Hangar 12) or maintained lawn and landscaped areas (flight simulator building). These areas are expected to harbor limited wildlife and limited suitable habitat for wildlife (see Figure 2-1, Section 2). Landscaped areas are used by wildlife species able to acclimate to human disturbance. These include small mammals such as the raccoon (*Procyon lotor*), the house mouse (*Mus musculus*), squirrels, and moles; songbirds such as swallows and the American robin (*Turdus migratorius*); non-native birds such as the European starling (*Sturnus vulgaris*) and rock pigeon (*Columba livia*); and common reptiles such as garter snakes (*Thamnophis* spp. [EA EST 1996]).

Other habitats at Ault Field include grasslands, wet meadows, forests, coastal bluffs, beaches, dunes, freshwater wetlands, and marine and riparian habitats. The grasslands at Ault Field have little structural diversity and provide a low number of habitat niches for relatively few wildlife species. Similarly, the wet meadows at Ault Field lack structural diversity and the hydrologic regime necessary to provide surface water year-round and thus attract fewer species than areas with more complex wetland systems and deeper marsh and open water components. Wildlife that could be present in the Ault Field habitats includes migratory waterfowl, neotropical migratory songbirds, raptors, small burrowing mammals, and reptiles. The northern harrier (*Circus cyaneus*) is known to nest in undisturbed grasslands near the runway (EA EST 1996). Other species observed in these habitats during field surveys included the great blue heron (*Ardea herodias*) and black-tailed deer (*Odocoileus hemionus columbianus* [E & E 2007]).

The highest diversity of wildlife species at Ault Field occurs in the southwest portion of the installation, in the vicinity of Rocky Point. This area contains stands of mature forest, coastal bluffs, beach strand, native dune vegetation, and a large freshwater wetland. The freshwater wetland has been identified by the Washington Department of Natural Resources as a significant habitat for neotropical migratory birds (EA EST 1996).

Several small and two relatively large forest blocks are scattered throughout Ault Field. Common wildlife using the forested habitat include the black-tailed deer, cottontail rabbit (*Sylvilagus floridanus*), raccoon, coyote (*Canis latrans*), garter snakes, salamanders (*Ambystoma* spp.), frogs (*Rana* spp.), and numerous species of birds. Marine habitats are located adjacent to the western boundary of Ault Field and comprise intertidal and subtidal areas. Numerous marine

fishes, terrestrial and aquatic mammals, and invertebrates occur on beaches and in adjacent waters associated with these habitats. Cormorants (*Phalacrocorax* sp.), loons (*Gavia* sp.), grebes (*Podiceps* sp.), and various species of diving ducks are common year-round and/or are seasonal residents of the marine habitats (EA EST 1996). There is no access to freshwater spawning and rearing habitats along the shores of Ault Field for anadromous species (Miller 2007).

The riparian habitat along the runway ditches and Clover Valley Lagoon provides nesting areas for many bird species, including ducks, rails, coots, blackbirds, and kingfishers. Amphibians that live in the aquatic and riparian habitat of the runway ditches and lagoon include frogs and salamanders. Clover Valley Stream, which has been straightened and channelized on the air station but transitions to a natural feature east of the installation, is listed by the WDFW as a priority resident fish habitat for resident cutthroat trout (*Oncorhynchus clarki* [WDFW 2010]). Farther east, Dugualla Bay is home to the many species of flora and fauna that are typical in other inlets in Puget Sound.

3.6.2 Federally Protected Species

3.6.2.1 Threatened and Endangered Species

The ESA of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants and the habitats in which they are found. The Navy ensures that consultations are conducted as required under Section 7 of the ESA for any action that “may affect” a federally listed threatened or endangered species. Although protection of species listed at the state level as threatened or endangered is not legally mandated for federal agencies, the Navy encourages cooperation with states to protect such species where such protection is consistent with an installation’s mission.

Information on the potential occurrence of federally listed threatened and endangered species within and in the vicinity of NAS Whidbey Island and adjacent waters was obtained from the USFWS Western Washington Fish and Wildlife Office; the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) Northwest Regional Office; the Washington Department of Fish and Wildlife (WDFW); and the Washington State Department of Natural Resources, Natural Heritage Program (WDRNHP).

Each of these agencies maintains databases to track the occurrence of threatened and endangered species: the USFWS and WDFW provide species occurrences on a county level (USFWS 2010a; WDFW 2010, 2011a; WDRNHP 2010); the NMFS provides species occurrences by marine and estuarine waterbodies (NMFS 2010a, b; WDFW 2010, 2011a). For

the purposes of this EA, USFWS and NMFS databases were searched to identify the potential occurrences of federally listed threatened and endangered species within Island County and the waters surrounding Whidbey Island. A total of 13 ESA-listed species were identified as occurring within the vicinity of Ault Field (Table 3-8). The current status of the species listed in these areas by the USFWS and NMFS was verified through the WDFW and WDNRNHP.

Potential impacts would be related to a proposed increase in the number of flight operations and noise. Given the nature of the proposed action, all listed species are addressed in this document; however, the risk for the marbled murrelet is greater than all of the ESA-listed species because of the height at which the marbled murrelet flies and the speed of the aircraft. For this reason, marbled murrelets are discussed in a separate section below.

Golden Indian Paintbrush (*Castilleja levisecta*): This perennial herb occurs in open grasslands at elevations below 330 feet around the periphery of the Puget Trough (USFWS 2011b). Most populations occur on glacially derived soils. Primary threats to this species include competition with encroaching native and non-native species, habitat modification through succession of grassland to shrub and forest habitat, habitat conversion through residential or commercial development, and grazing by herbivores (USFWS 2011b).

Five populations of golden paintbrush occur on the north half of Whidbey Island. The largest population occurs near Forbes Point on the Seaplane Base at Crescent Harbor, approximately 4 miles southeast of Ault Field. No populations or individual occurrences of the golden Indian paintbrush have been identified on Ault Field. Furthermore, no suitable habitat to support the species occurs within the proposed construction area.

Coastal/Puget Sound Bull Trout Distinct Population Segment (DPS): There are no suitable spawning streams on Whidbey Island. Most bull trout found along the shoreline are traveling from the Skagit, Stillaguamish, and Snohomish River systems to forage (Miller 2007). It is thought that bull trout primarily use the shallower nearshore waters along the eastern shore of Puget Sound and occasionally use or cross deeper waters to access nearshore locations along the west side of the sound. Bull trout have reportedly been caught by fishermen in some nearshore areas of Whidbey Island (Washington Conservation Commission April 2000); however, this catch may have been Dolly Varden (*S. malma*), because bull trout and Dolly Varden are closely related char species native to Washington State. They coexist in many of the same drainages and, being similar in appearance, are extremely difficult to differentiate visually (USFWS 1997). The waters of the Puget Sound are critical habitat area for this species.

Table 3-8 Federally Threatened and Endangered Species that May Occur at or in the Vicinity of NAS Whidbey Island

Category	Common Name	Scientific Name	ESA Listing	Presence in the Action Area
Plants	Golden Indian paintbrush	<i>Castilleja levisecta</i>	Threatened	No populations or individual occurrences have been identified on Ault Field. No suitable habitat to support the species occurs in the action area.
Fish	Washington-Puget Sound bull trout	<i>Salvelinus confluentus</i>	Threatened	No suitable spawning streams on Whidbey Island. The waters adjacent to Ault Field are designated as critical habitat.
	Bocaccio	<i>Sebastes paucispinis</i>	Endangered	Juveniles and young adults may inhabit shallow waters adjacent to Ault Field. There is no critical habitat.
	Canary rockfish	<i>Sebastes pinniger</i>	Threatened	
	Yelloweye rockfish	<i>Sebastes ruberrimus</i>	Threatened	
	Puget Sound Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Threatened	No suitable spawning streams occur on Whidbey Island. The waters adjacent to Ault Field are designated as critical habitat.
	Puget Sound steelhead	<i>Oncorhynchus mykiss</i>	Threatened	No suitable spawning streams occur on Whidbey Island. The waters adjacent to Ault Field are designated as critical habitat.
	Eulachon (Columbia River smelt)	<i>Thaleichthys pacificus</i>	Threatened	No suitable spawning streams occur on Whidbey Island. Populations may inhabit waters adjacent to Ault Field.
	North American green sturgeon	<i>Acipenser medirostris</i>	Threatened	No suitable spawning streams occur on Whidbey Island. Adults may inhabit waters adjacent to Ault Field.
Mammals	Humpback whale	<i>Megaptera novaengliae</i>	Endangered	Low numbers of individuals are known to be present in waters adjacent to Ault Field and in the Strait of Juan de Fuca.
	Southern resident killer whale	<i>Orcinus orca</i>	Endangered	Individuals have been observed numerous times during spring, summer, and fall in the Strait of Juan de Fuca, including waters adjacent to Whidbey Island, including Ault Field.
	Steller sea lion	<i>Eumetopias jubatus</i>	Threatened	Low numbers of individuals are known to be present in waters adjacent to Ault Field and in the Strait of Juan de Fuca.
Birds	Marbled murrelet	<i>Brachyramphus marmoratus</i>	Threatened	Surveys indicate that marbled murrelet densities in shallow waters adjacent to Whidbey Island, including those off of Ault Field range from 2 to nearly 4 individuals per square mile.

Source: NMFS 2010a, b; USFWS 2010b; WDFW 2011a; WDNRNHP 2010

Puget Sound/Georgia Basin Bocaccio (*Sebastes paucispinis*) DPS and Puget Sound/Georgia Basin Canary Rockfish (*Sebastes pinniger*) DPS: Adult bocaccio and canary rockfish generally reside in water deeper than 160 feet, but juveniles and young adults inhabit shallow waters (NMFS 2011a, 2011b) such as those adjacent to Whidbey Island. No critical habitat has been designated for these species at this time.

Puget Sound/Georgia Basin Yelloweye Rockfish (*Sebastes ruberrimus*) DPS: Adult yelloweye rockfish generally reside in water deeper than 80 feet, and often more than 300 feet, but juveniles and young adults inhabit shallow waters (NMFS 2011c) such as those adjacent to Whidbey Island. No critical habitat has been designated for this species at this time.

Puget Sound Chinook Salmon (*Oncorhynchus tshawytscha*) Evolutionarily Significant Unit (ESU): There are no suitable spawning streams on Whidbey Island for Chinook salmon. However, the east and west coast of Whidbey Island, including Crescent Harbor, Skagit Bay, and the Strait of Juan de Fuca, is included in the Puget Sound Chinook salmon ESU critical habitat (NMFS 2011d).

Puget Sound Steelhead (*Oncorhynchus mykiss*) ESU: There are no suitable spawning streams on Whidbey Island for steelhead trout. However, naturally spawned steelhead populations occur in streams in the river basins of the Puget Sound, Strait of Juan de Fuca, and Hood Canal, Washington (NMFS 2011e). This anadromous fish² thus is likely to be present in the marine waters adjacent to Whidbey Island, which is designated steelhead critical habitat.

Southern Eulachon (*Thaleichthys pacificus*) DPS: The eulachon is anadromous, and in the continental United States most eulachon originate in the Columbia River basin (NMFS 2011f). Therefore, these eulachon would not pass through the Puget Sound or Strait of Juan de Fuca on the way to the ocean. However, because eulachon are occasionally recorded in the coastal rivers and tributaries of the Puget Sound (NMFS 2011f), they could occur in the waters off Whidbey Island. There is no suitable spawning habitat on Whidbey Island for this species.

Southern North American Green Sturgeon (*Acipenser medirostris*) DPS: The critical habitat for the southern North American green sturgeon DPS includes coastal United States marine waters up to 360 feet deep from Monterey Bay, California, north to Cape Flattery, Washington, including the Strait of Juan de Fuca (74 *Federal Register* [October 9, 2009]: 52300-52351). The adult green sturgeon resides in nearshore oceanic waters, bays, and estuaries (NMFS 2011g) and could occur in the waters off Whidbey Island.

² Anadromous fish are those that return to fresh water to spawn.

Humpback Whale (*Megaptera novaeangliae*): The outer shore of western Washington was historically inhabited by humpback whales. Currently, waters off of northern Washington may be areas where California, Oregon, Washington, and British Columbia whales mix (NMFS 1991). Feeding typically occurs over deep, oceanic waters during migration, while feeding and breeding habitats are mostly in shallow coastal waters over continental shelves (Clapham and Meade 1999). The species typically feeds on krill (*Euphausia pacifica*) and small schooling fish, including herring (*Clupea harengus*), mackerel, sand lance, sardines, anchovies, and capelin. Humpback whales are known to be present in the Strait of Juan de Fuca in low numbers and in recent years have been sighted, but only rarely, in Puget Sound (Miller 2007). They are now considered only occasional visitors to the area (Falcone et al. 2005). With regards to their hearing, while no tests on humpback whale hearing have been made, Houser et al. (2001) constructed a humpback audiogram using a mathematical model based on the internal structure of the ear and estimated sensitivity to frequencies from 0.7 to 10 kHz, with maximum relative sensitivity between 2 and 6 kHz.

Southern Resident Killer Whale (*Orcinus orca*) DPS: The southern resident killer whale resides in the inland waterways of Puget Sound in the spring, summer, and fall and has been observed numerous times in the Strait of Juan de Fuca, including areas adjacent to Whidbey Island (NMFS 2008). These waters provide critical habitat for this species (NMFS 2011h). When feeding, this species most commonly targets chinook salmon. It appears to consume other salmonids that appear less frequently, such as rockfish, halibut (*Hippoglossus stenolepis*), lingcod (*Opius elongatus*), and herring. Both behavioral and auditory brainstem response techniques indicate that killer whales have a frequency range of 1 to 100 kHz and are most sensitive at 20 kHz (Szymanski et al. 1999).

Steller Sea Lion (*Eumetopias jubatus*): Although no rookeries exist in the state of Washington, Steller sea lions are present throughout the year (WDFW 2000). Numbers vary seasonally throughout the year, with peak counts of 1,000 sea lions present during the fall and winter months. Haul-out sites are found on jetties, offshore rocks, and islands. Major haul-out sites are located along the outer coast from the Columbia River to Cape Flattery, as well as in the Strait of Juan de Fuca, and occasionally on navigation buoys in Puget Sound (WDFW 2000). Steller sea lions have been documented to haul out on Navy submarines in the Puget Sound (U.S. Navy 2001a). Steller sea lions are opportunistic predators, feeding primarily on fish and cephalopods, and their diet varies geographically and seasonally. No haul-out sites have been recorded on Whidbey Island (WDFW 2011a), although Steller sea lions have been known to

occur around the island. This area provides critical habitat for this species. When the underwater hearing sensitivity of two Steller sea lions was tested, the hearing threshold of the male was significantly different from that of the female. The range of best hearing for the male was from 1 to 16 kHz, with maximum sensitivity (77 decibels relative to 1 micropascal [dB re 1 μ Pa-m]) at 1 kHz. The range of best hearing for the female was from 16 to above 25 kHz, with maximum sensitivity (73 dB re 1 μ Pa-m) at 25 kHz. However, because of the small number of animals tested, the findings could not be attributed to individual differences in sensitivity or sexual dimorphism (Kastelein et al. 2005).

Marbled Murrelet. The marbled murrelet is federally listed as threatened under the ESA. The Migratory Bird Treaty Act (MBTA) also protects the marbled murrelet. According to a five-year review completed by the USFWS in 2009, the national marbled murrelet population has been declining (between 2.4% and 4.3% annually) (USFWS 2009). Primary causes of this species' decline are habitat degradation (e.g., human-induced and wild fires); fragmentation of forests; and over-harvesting of old-growth coastal forests. In the marine environment, factors contributing to its decline include oil spills and the use of gill-netting in inshore areas (Nelson 1997).

The marbled murrelet is an alcid (a web-footed diving bird with short legs and wings), less than 10 inches long. This species ranges from Alaska to western central California (Santa Cruz County), occurring mainly within 3 miles of shore. Distribution can vary depending on coastline topography, river plumes, the presence of coastal forest, and season (Falxa et al. 2009). The marbled murrelet nests in either forested or rocky areas, depending on its location in its range. More specifically, the species breeds in forested areas on sea-facing slopes, cliffs on islands, and cliffs along the coast (Nelson 1997). During the breeding season, murrelets are typically bound to their nesting sites. After breeding and during winter, the marbled murrelet tends to disperse and move farther offshore. The highest concentrations of murrelets still tend to occur close to shore and within protected waters.

In Washington State, the marbled murrelet breeds exclusively in forested habitats (Nelson 1997). Within these habitats, the optimal habitat for the marbled murrelet includes areas with the following characteristics:

- A greater number of potential nest platforms
- A greater percentage of dominant trees (trees 32 inches in diameter or larger) with moss

- A lower density of moss on dominant trees (as compared to a randomly chosen site in the same habitat)
- Low elevation
- The presence of old-growth western hemlock (*Tsuga heterophylla*).

The presence of these birds within Washington State decreases with increasing stand elevation, distance inland, lichen cover, and canopy cover (Nelson 1997).

Occurring in the waters adjacent to Whidbey Island, the marbled murrelet is considered an opportunistic feeder rather than a specialist, consuming prey that is most readily available at different times of the year, wherever prey is available. The marbled murrelet's foraging patterns vary seasonally. In the summer, the marbled murrelet forages within 3 miles of shore, generally preferring shallow water that is usually less than 200 feet deep. The foraging activity during this time is highest in areas of upwelling, shallow banks, mouths of bays, narrow passages between islands, over underwater sills, and within kelp beds. During summer, marbled murrelets in Puget Sound primarily forage on Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea pallasii*), and surf smelt (*Hypomesus pretiosus* [Penttila 2007]). Winter foraging habitat is similar to summer foraging habitat. Murrelet individuals typically forage in stratified waters (e.g., tidal rips or river mouths) within 3 miles of the shore (Nelson 1997). In winter, their dominant prey includes krill, mysid shrimp (*Americamysis bahia*), amphipods, and Pacific herring (Nelson 1997).

The marbled murrelet populations are split into six geographic areas, or Conservation Zones, from the Canadian border to approximately San Francisco Bay (USFWS 1997b). Two of these zones are in Washington: conservation zone 1, which includes the Strait of Juan de Fuca, Hood Canal, and the San Juan Islands; and conservation zone 2, which includes the outer Washington coast. The proposed action would occur within conservation zone 1.

In the Puget Sound region of northwest Washington State, the population estimate of marbled murrelets is 5,623 individuals (Falxa et al. 2009). This population declined 7.4% from 2001 to 2010 (WDFW 2011b). Marbled murrelets are distributed throughout the inland marine waters of Washington during the summer, with higher concentrations in the San Juan Islands, north Hood Canal, and south coast of the Strait of Juan de Fuca. In winter, the concentration shifts toward the more protected waters of the San Juan Islands, Hood Canal, Discovery Bay, Saratoga Passage, and Port Townsend (Strachan et al. 1995).

Surveys along the inner coastline of Whidbey Island (including Crescent Harbor) found that marbled murrelet densities were 3.73 per square mile during the 2000 to 2003 breeding season (Miller et al. 2006). However, monitoring data from 2005 showed the average density of marbled murrelets within the inland waters of Puget Sound was approximately 2.42 per square mile in areas close to shore (Raphael et al. 2007). Surveys indicate that marbled murrelets likely occur in Crescent Harbor and Floral Point (Naval Base Kitsap-Bangor) throughout the year, as these alcids were also sighted in winter (Nysewander et al. 2005; Falxa et al. 2009). The Puget Sound Ambient Monitoring Program reported a 1.84-fold increase in densities between summer and winter (Nysewander et al. 2005). Densities begin increasing in late fall/early winter and start to decline in late winter/early spring (Miller et al. 2006).

The marbled murrelet's preferred habitat type—old-growth coniferous forests near coastal areas—occurs only in small patches at NAS Whidbey Island. None of these small patches have been identified as supporting marbled murrelet nesting (U.S. Navy 2005b). Also, no marbled murrelet occupancy sites are currently known to be present at Ault Field. This species has been known to forage in the inshore marine environment and has been observed foraging in the waters next to Ault Field (U.S. Navy 2005b).

3.6.2.2 Marine Mammals

All marine mammals are protected under the MMPA of 1972, amended in 1994. The MMPA is administered by the NMFS and the USFWS. This act generally prohibits “take” of marine mammals in U.S. waters by any person and by U.S. citizens in international waters. “Take” under MMPA is defined as harass, hunt, capture, kill, or collect, or attempt to harass, hunt, capture, kill or collect. However, there are certain exceptions to the take prohibitions. MMPA allows lawful activities to incur incidental take if an incidental take permit is obtained. In accordance with this act, the Navy does not deliberately take a marine mammal.

Harassment as defined under military readiness activities in the MMPA is classified as either Level A or Level B. MMPA Level A harassment includes any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild. MMPA Level B harassment for military readiness activities is “any act that disturbs or is likely to disturb a marine mammal or marine mammal stock by causing disruption of natural behavioral patterns including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering to a point where such behaviors are abandoned or significantly altered.”

Six marine mammals that are not listed under the ESA but that receive protection under the MMPA may occur in the waters adjacent to Ault Field: minke whale (*Balaenoptera acutorostrata*), gray whale (*Eschrichtius robustus*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), California sea lion (*Zalophus californianus*), and harbor seal (*Phoca vitulina richardii*).

Minke Whale: The minke whales found in waters off California, Oregon, and Washington appear to be resident in that area and to have home ranges, whereas those farther north are migratory. Minke whales typically feed on krill, Japanese anchovy (*Engraulis japonicus*), Pacific saury (*Cololabis saira*), herring, sand lance (*Ammodytes* sp.), and walleye pollock (Perrin and Brownell 2002).

Within the Puget Sound, there is an area of primary occurrence around the San Juan Islands and in the Strait of Juan de Fuca (see Figure 1-1 for geographic locations). This occurrence extends into Admiralty Inlet on the west side of Whidbey Island. Dorsey et al. (1990) noted minke whales feeding in locations of strong tidal currents in inland waters of Puget Sound; prey included juvenile herring and probably sand lance (Hoelzel et al. 1989). While no empirical data on the hearing ability of this species are available, Ketten (1997) hypothesized that mysticetes (large whales with baleen such as this species) are most adapted to hear low to infrasonic frequencies.

Gray Whale: Widely distributed in the Pacific, from the Bering Sea (feeding grounds) to the Gulf of Mexico (during breeding), some gray whales enter Puget Sound during their migration. In recent years, gray whales have been sighted in the southern part of Puget Sound, particularly in Elliott Bay. Gray whales are known to enter Puget Sound in spring and remain there through the early summer months; some are present in the region as early as January (Calambokidis et al. 1994). The area of primary occurrence extends from the outer coast into the Strait of Juan de Fuca to north of the Kitsap Peninsula, including the area around Whidbey Island. Gray whales are sensitive to low noise levels. The threshold for inducing feeding interruptions from air gun noise was a received level of 173 dB re 1 μ Pa-m. For continuous industrial noise, the threshold for inducing avoidance was a received level of 120 dB re 1 μ Pa-m (Malme et al. 1984).

Harbor Porpoise: Harbor porpoise are generally found in cool temperate to subarctic waters over the continental shelf in both the North Atlantic and North Pacific. They feed primarily on Pacific herring, market squid, and smelts (Gearin et al. 1994; Read 1999). The harbor porpoise used to be common throughout Puget Sound (Scheffer and Slipp 1948; Flaherty

and Stark 1982). However, most recent sightings in Puget Sound have been limited to the central portion, with several sightings north of Whidbey Island (Calambokidis et al. 1992; U.S. Navy 2006; Raum-Suryan and Harvey 1998). Recent psycho-acoustic studies of harbor porpoise found the range of best hearing to be 16 to 140 kHz, with a reduced sensitivity around 64 kHz and maximum sensitivity between 100 and 140 kHz (Kastelein et al. 2002).

Dall's Porpoise: Feeding primarily on small fish and squid, the Dall's porpoise is the most common cetacean in northern Puget Sound, occurring often off of the northern end of Whidbey Island (Osborne et al. 1988). There are no published data on the hearing abilities of this species. However, based on the morphology of the cochlea, the upper hearing threshold is estimated to be about 170 to 200 kHz (Awbrey et al. 1979).

California Sea Lion: In the non-breeding season, adult and subadult males of this species migrate northward along the coast to the Pacific Northwest, including Washington. They feed on a wide variety of prey, including many species of fish and squid (Antonelis et al. 1990; Lowry et al. 1991). Present in Puget Sound from around September through May, they have been observed hauled out on log booms, navigation buoys, and U.S. Navy submarines (NMFS 1997; Jeffries et al. 2000; U.S. Navy 2001a). Their range of maximum hearing sensitivity underwater is between 1 and 28 kHz, and they show relatively poor hearing at frequencies below 1 kHz (Schusterman et al. 1972; Kastak and Schusterman 1998). In air, the effective upper hearing limit is approximately 36 kHz, and the best range of sound detection is from 2 to 16 kHz (Schusterman 1974).

Harbor Seal: As opportunistic feeders, feeding on fish and invertebrates, harbor seals are a coastal species, rarely found more than 12 miles from shore. Haul-out areas can include intertidal and subtidal rock outcrops, sandbars, sandy beaches, peat banks in salt marshes, and manmade structures such as log booms, docks, and recreational floats (Schneider and Payne 1983; Jeffries et al. 2000). Human disturbance can affect haul-out choice (Harris et al. 2003). Harbor seals hear nearly as well in air as underwater (Kastak and Schusterman 1998). In water, they hear frequencies from 1 to 180 kHz and are most sensitive to frequencies below 50 kHz. In air, they hear frequencies from 0.25 kHz to 30 kHz and are most sensitive to 6 to 16 kHz (Richardson 1995; Terhune and Turnbull 1995; Wolski et al. 2003).

3.6.2.3 Bald and Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act of 1940, as amended in 1978. This act prohibits anyone without a permit issued by the Secretary of

the Interior from “taking” bald or golden eagles, including their parts, eggs, or nests. It defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb” (16 U.S.C. 668-668d). “Disturb” means “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior” (50 CFR Part 22). Inactive eagle nests, which may become active again, are also protected under the act.

Recovery of the bald eagle has been especially dramatic in Washington State, where the number of occupied nests increased from 105 in 1980 to 840 in 2005. Bald eagle nesting territories are now found along much of the shorelines of Puget Sound. Washington State also supports the largest wintering population of bald eagles in the continental U.S. (Stinson et al. 2001).

According to WDFW priority species habitat maps, a number of bald eagle territories are present in and around Ault Field. Bald eagles are often observed along NAS Whidbey Island’s shoreline perched in trees on the top of shoreline bluffs. Three bald eagle nests are located on or immediately adjacent to Ault Field: one is in the southwest portion of the installation along the coastline at Rocky Point, and two are adjacent to the northern boundary of Ault Field (WDFW 2012). A study completed in 1996 (EDAW, Inc. 1996) found that eagles use most of the Ault Field shoreline bordering the Strait of Juan de Fuca. Five areas of concentrated bald eagle use were identified at Ault Field:

- The area immediately surrounding Rocky Point
- The point north of Cliffside Park
- The 1 mile of shoreline adjacent to the sewage treatment pond
- The pilings/approach lights on and just offshore of the approach (northwest) end of Runway 15
- The area along the northern boundary of Ault Field near the North Gate.

A number of nests also have been located along the western shoreline of Whidbey Island. It is believed that eagles nesting at these various locations frequently forage in Oak and/or Crescent Harbors.

Golden eagles are foraging, transient visitors to NAS Whidbey Island during migration periods. There are no known nests of golden eagles on the installation (NAS Whidbey Island 2012).

3.6.2.4 Migratory Birds

The MBTA is the primary legislation in the United States established to conserve migratory birds. The MBTA prohibits taking, killing, or possessing migratory birds except under the terms of a valid permit issued pursuant to federal regulation. Under 50 CFR Part 21, the Armed Forces are authorized to take migratory birds during military readiness activities; however, the Armed Forces must confer and cooperate with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects of military readiness activities if it determines that such activities may have a significant adverse effect on a population of migratory birds. Congress defines military readiness as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem.

Military readiness activities include operation and maintenance of the aircraft at an airfield. However, construction of support infrastructure operations is not considered a military-readiness activity. Migratory bird conservation in relation to non-military readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with EO 13186, “*Responsibilities of Federal Agencies to Protect Migratory Birds*”, signed January 10, 2001. This memorandum between the DOD and the USFWS outlines the responsibility of federal agencies to protect migratory birds and how to incorporate conservation efforts into their routine operations and construction activities and was recently re-signed to cover DOD activities through 2013.

In 1994, the Navy conducted a point-count for neotropical migratory songbirds at NAS Whidbey Island in cooperation with the Student Conservation Association. The most frequently observed neotropical migratory songbirds at the station included the American robin, savannah sparrow (*Passerculus sandwichensis*), song sparrow (*Melospiza melodia*), marsh wren (*Cistothorus palustris*), American goldfinch (*Spinus tristis*), bushtit (*Psaltriparus minimus*), rufous hummingbird (*Selasphorus rufus*), European starling, American crow (*Corvus*

brachyrhynchos), chestnut-backed chickadee (*Poecile rufescens*), golden-crowned kinglet (*Regulus satrapa*), Swainson's thrush (*Catharus ustulatus*), red-winged blackbird (*Agelaius phoeniceus*), common yellowthroat (*Geothlypis trichas*), and house finch (*Carpodacus mexicanus* [EA EST 1996]).

3.6.3 Bird/Aircraft Strike Hazard

The presence of resident and migratory birds creates a BASH risk at NAS Whidbey Island. NAS Whidbey Island comprises diverse habitat structures. When habitat diversity increases, the number of species attracted also increases. This diverse habitat structure is desirable for many avian species but can be hazardous to flight operations. The greatest risk occurs at Ault Field due to the presence of water-filled ditches, freshwater wetlands, marine shoreline, perch sites, tall brush, and short grass in the vicinity of the runways, all of which attract numerous bird species.

From a wildlife management perspective, diverse habitats provide all three of the essential items for birds: food, water, and shelter. Food is in the form of small mammals and/or fruit/seed bearing vegetation. The existing shelter provides hiding, loafing, nesting, and thermal cover, as well as excellent habitat for a thriving prey base of insects, mice, voles, and rabbits. The prey base is the main attractant for many bird species, including several species of raptors such as bald eagles, red-tailed hawks (*Buteo jamaicensis*), rough-legged hawks (*B. lagopus*), and northern harriers (*Circus cyaneus*), which create an airstrike hazard.

In FY2011, a total of 64 birds were struck by aircraft during flight operations at NAS Whidbey Island, with the highest number of strikes (25) occurring in September (Queen 2012). Bird species struck included dark-eyed junco (*Junco hyemalis*), Vaux's swift (*Chaetura vauxi*), rock dove/pigeon (*Columba livia*), dunlin (*Calidris alpina*), various thrush, ring-billed gull (*Larus delawarensis*), MacGillivray's warbler (*Oporornis tolmiei*), American goldfinch (*Carduelis tristis*), mallards, barn swallow (*Hirundo rustica*), western meadowlark (*Sturnella neglecta*), mourning dove (*Zenaida macroura*), savannah sparrow (*Passerculus sandwichensis*), great horned owl (*Bubo virginianus*), Arctic tern (*Sterna paradisaea*), red-tail hawk, northern harrier, and numerous unknown species.

3.7 Cultural Resources

3.7.1 Regulatory Framework

Section 106 of the NHPA of 1966, as amended, requires federal agencies to integrate consideration of historic preservation into the early stages of project planning. Under Section 106, the head of any federal agency having direct or indirect jurisdiction over a proposed federal or federally financed undertaking is required to account for the effects of the proposed action on any district, site, building, structure, or object that is included or is eligible for inclusion in the NRHP. Eligibility determinations are based on NRHP criteria (Table 3-9) for historic significance and National Park Service (NPS) criteria (Table 3-10) for architectural integrity.

Table 3-9 National Register of Historic Places Criteria for Historic Significance

36 CFR 60.4, Part I
The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:
<ul style="list-style-type: none"> A. That are associated with events that have made a significant contribution to the broad patterns of our history; or B. That are associated with the lives of persons significant in our past; or C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or D. That have yielded, or may be likely to yield, information important in prehistory or history.
36 CFR 60.4, Part II
Ordinarily, cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the NRHP. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:
<ul style="list-style-type: none"> A. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or B. A building or structure removed from its original location but which is significant primarily for architectural value or which is the surviving structure most importantly associated with a historic person or event; or C. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or D. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or E. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan and when no other building or structure with the same association has survived; or F. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or G. A property achieving significance within the past 50 years if it is of exceptional importance.

Table 3-10 National Park Service Criteria for Architectural Integrity

Criteria	Definition of Architectural Integrity
Location	Must not have been moved.
Design	Must retain historic elements that create the form, plan, space, structure, and style of the property.
Setting	Setting must retain its historic character.
Materials	Must retain the key exterior materials dating from the period of its historic significance.
Workmanship	Methods of construction from its time of significance must be evident.
Feeling	Physical features must convey its historic character.
Association	Must be the actual place where a historic event or activity occurred and must be sufficiently intact to convey that relationship to an observer.

Source: NPS 1995.

The Advisory Council on Historic Preservation (ACHP) has published regulations detailing the Section 106 consultation process in 36 CFR Part 800. Pursuant to these regulations, the federal agency must determine and document the area of potential effect (APE), defined in § 800.16(d) as “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.” For the purposes of the Section 106 consultation process, the Navy has determined that the APE for the proposed action consists of Hangar 8 (Building 2642); Hangar 10 (Building 2699) and its six auxiliary buildings (R-42, R-55, R-56, 2705, 2893, and 2894); Hangar 12 (Building 2737); and the flight simulator building (Building 2593). All historic resources at Ault Field are individually eligible; there are no historic districts in the flight line area (U.S. Navy 2002a; Houser 2010).

3.7.2 Architectural Resources

In a letter dated January 26, 2010, the Washington SHPO determined that Ault Field is not eligible as a historic district. However, Ault Field does contain some resources that are individually eligible for the NRHP (Houser 2010).

The buildings in the APE—Hangar 8 (Building 2642), Hangar 10 (Building 2699), Hangar 12 (Building 2737), and the flight simulator building (Building 2593)—were determined not eligible for the NRHP by the Washington SHPO (Houser 2010). Hangar 10’s six auxiliary buildings (R-42, R-55, R-56, 2705, 2893, and 2894) also are not eligible because Buildings 2705, 2893, and 2894 are less than 50 years old and Buildings R-42, R-55, and R-56 are temporary buildings that are less than 50 years old.

Figure 2-1 (Section 2) shows the facility modifications that would occur under the three action alternatives. These facility modifications would include the following:

■ **All three action alternatives.**

- Demolition of four of Building 2699's (Hangar 10) auxiliary buildings (R-42, R-55, R-56, and 2705)
- Relocation of two of Building 2699's (Hangar 10) auxiliary buildings (2893 and 2894) from their current location between Buildings 2699 and 2642 (Hangar 8) to a previously disturbed area between Hangars 10 and 12 (Buildings 2699 and 2737, respectively)
- Construction of an approximately 32,500-square-foot addition to Building 2699 (Hangar 10)
- Construction of an approximately 9,200-square-foot facility as a flight simulator building.

■ **Alternative 1.** No additional facility modifications.

■ **Alternative 2.** Construction of an approximately 25,200-square-foot addition to Building 2737 (Hangar 12).

■ **Alternative 3.** Construction of an approximately 4,300-square-foot addition to Building 2737 (Hangar 12).

The APE for this undertaking is defined as these buildings.

Of the ten buildings included in the action alternatives, four have been previously evaluated and determined not eligible for listing in the NRHP (Reference Log # 012610-05-USN). These include 2593 (flight simulator), 2642 (Hangar 8), 2699 (Hangar 10), and 2737 (Hangar 12). Buildings 2705, 2983, and 2894 do not need evaluations as they are less than 50 years old, built in 1986, 2006, and 2006, respectively. Buildings R-42, R-55, and R-56 are temporary buildings and are not eligible for the NRHP.

3.7.3 Archaeological Resources

The Navy has evaluated information for archaeological resources at Ault Field that is included in the *Historic and Archaeological Resources Protection Plan* (Dames and Moore 1994), the *Archaeological Resources Assessment and Protection Plan*, and the *Integrated Cultural Resources Management Plan* (U.S. Navy 2002a) for NAS Whidbey Island. Ault Field was evaluated for the potential presence of archaeological resources in 1994 and 1997, which included limited field reconnaissance. Results of these evaluations indicated that while there are a number of archaeologically sensitive areas at Ault Field, they are all located in relatively undeveloped areas at the perimeter of the airfield. Based on subsequent archaeological resource assessments of NAS Whidbey Island, archaeological resources were identified, but none are in the APE and none of the archaeological sites at Ault Field are eligible for the NRHP (U.S. Navy 2002a).

Based on this evaluation, the Navy has determined that the APE is located in an area of Ault Field that is not considered archaeologically sensitive. The APE would have sustained prior surface and subsurface ground disturbance during construction of the runways and associated buildings and structures at Ault Field between 1940 and 1989, such that it is unlikely that any intact archaeological deposits are present.

3.8 Water Resources

3.8.1 Surface Water

Ault Field is located in the upper Puget Sound basin, at the eastern end of the Strait of Juan de Fuca. Defined by the U.S. Geological Survey (USGS) as a 95-mile-long channel, the Strait of Juan de Fuca is the principal outlet for the Georgia Strait and Puget Sound, connecting both to the Pacific Ocean (USGS 2007). NAS Whidbey Island includes 15.5 miles of shoreline bordering the inland estuarine waters of Puget Sound. These waters include the Strait of Juan de Fuca, Admiralty Inlet, Oak Harbor, Crescent Harbor, and Saratoga Passage. The eastern end of Ault Field is approximately 2 miles west of Dugualla Bay, a waterbody on the northeast corner of Whidbey Island that leads into the larger Skagit Bay to the east.

No naturally occurring rivers, streams, lakes, or ponds are present on Ault Field. The original shallow, meandering watercourses that were present on Ault Field have been channelized and straightened into a series of ditches that now comprise the station's stormwater conveyance system. These ditches have a total length of approximately 20 miles (EA EST 1996).

NAS Whidbey Island complies with its National Pollutant Discharge Elimination System (NPDES) permit for release of stormwater from various industrial facilities located at the station. As part of the permit program, NAS Whidbey Island has prepared a stormwater pollution prevention plan to control stormwater discharges from the station that may adversely affect the water quality in the Strait of Juan de Fuca and Dugualla Bay. The plan identifies potential sources of stormwater contamination and describes the BMPs that are used to prevent or minimize exposing stormwater to pollutants. Structural BMPs are used at on-base industrial and process areas such as vehicle or aircraft maintenance, wash-down, and fueling areas; material storage, loading, and unloading areas; and waste disposal areas that are exposed to stormwater. Structural BMPs include erosion and sediment controls, berms or dikes around critical areas, retention/detention basins, oil/water separators, and leak detection systems. Non-structural BMPs include preventive maintenance practices, regular inspections, spill prevention and

response, procedures and practices for significant materials storage and handling, and regular pavement cleaning to remove oil and grease.

3.8.2 Groundwater

Groundwater beneath NAS Whidbey Island is present in three main aquifer systems: the shallow, intermediate, and deep aquifers. The aquifers are composed of sand or sand and gravel with confining layers of till, clay, and silt. The shallow aquifer is a major water-bearing zone on Whidbey Island and generally ranges in depth from 20 to 145 feet below ground surface (bgs); the intermediate aquifer extends throughout the northern portion of Whidbey Island, and its water levels are generally 5 to 20 feet beneath the shallow aquifer; the deep aquifer (or sea-level aquifer) is a continuous water-bearing zone on Whidbey Island, with water levels ranging from 11 to 17 feet above sea level (Simonds 2002).

The EPA has designated the Whidbey Island aquifer system as a sole-source aquifer: it is the only supply of potable water for at least half of the residents. There is no viable alternative source of drinking water for those using groundwater, and the aquifer boundaries have been defined (URS 1995).

Water-level data from environmental investigations at NAS Whidbey Island and regional studies indicate that groundwater flow at Ault Field generally follows surface topography. Most of the groundwater underlying Ault Field converges in the central runway areas and likely discharges eastward to Dugualla Bay. Groundwater along the western side of Ault Field appears to discharge westward to the Strait of Juan de Fuca (EA EST 1996).

NAS Whidbey Island does not use groundwater as a source of drinking water. Rather, treated surface water is piped to the installation from the Skagit River. The City of Oak Harbor uses the Skagit River for 75% of its drinking water, with the remaining 25% supplied by three municipal wells. Island County residents near Ault Field who are not located in the Oak Harbor water district use private wells for drinking water.

In the mid-1990s, contaminated groundwater was found to be migrating off site toward private water supply wells. The source of this groundwater contamination was a former landfill located in the southeastern portion of the installation. In response, the Navy designed an extraction and treatment system to treat and control the migration of contaminated groundwater. All private wells in the vicinity of the contaminant plume were closed, and the residences were connected to public water supplies (Agency for Toxic substance and Disease Registry [ATSDR] 1993).

3.8.3 Floodplains

EO 11988, *Floodplain Management*, requires federal agencies to identify and consider practicable alternatives for locating incompatible facilities in areas identified as floodplains. The EO defines the term “floodplain” as “the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a 1% or greater chance of flooding in any given year.” This zone of a 1% or greater chance of flooding in any given year is also commonly referred to as the 100-year floodplain because flooding is expected to occur once every 100 years, on average. Where practicable alternatives to siting federal facilities in the 100-year floodplain are not available, the facilities must be constructed in accordance with and be consistent with the intent of the standards and criteria of the National Flood Insurance Program.

According to the Island County Planning and Community Development, areas within the 100-year floodplain at Ault Field have been mapped by the Federal Emergency Management Agency (FEMA) as Zone V (Griffin 2012). Zone V are areas along coasts subject to inundation by the 1% annual-chance flood event with additional hazards associated with storm-induced waves (FEMA 2012). Storm-related tidal flooding occasionally occurs east of the runways, next to the eastern boundary of the installation, during winter storms when high winds combine with extreme high tides on Dugalla Bay to bring the tidal surge farther inland than normal (EA EST 1996). The runway ditch network handles stormwater drainage for Ault Field and the surrounding area. None of the proposed construction areas at NAS Whidbey Island are prone to flooding from stormwater flow through the airfield ditch system.

3.9 Socioeconomics

Oak Harbor and Island County, Washington, are in the Seattle-Tacoma-Bellevue metropolitan statistical area (MSA). Approximately 25% of Island County residents commute beyond the county limits for employment, primarily to Snohomish, King, and Skagit counties (State of Washington Office of Financial Management 2004). However, because of concerns about limited off-island linkages, Island County is working to develop more commercial centers and light industry that would provide employment opportunities for county residents (U.S. Navy 2005b).

NAS Whidbey Island is a major employer in the county, both directly and indirectly. Table 3-11 summarizes the air station’s direct economic impact in Island County. Besides employment in the federal, state, and local government sectors, Island County employment

includes the retail, construction, real estate, health care, and accommodation and food services sectors (U.S. Navy 2005b).

Table 3-11 Direct Economic Impacts of NAS Whidbey Island on Island County

Employment, uniformed and civilian personnel	10,066 personnel
Payroll	\$399.1 million
Military retiree pensions	\$91.1 million
TriCare payments to private providers	\$14.1 million
Contracts for goods and services	\$12.2 million
On-station retail spending	\$22.0 million
Net direct spending ¹	\$516.5 million

Source: State of Washington Office of Financial Management 2004

Note:

¹Reduced by on-station retail spending.

Environmental Justice and Protection of Children

In 1994, EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (Environmental Justice)*, was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income populations. This EO was also established to ensure that, if there were disproportionately high and adverse human health or environmental effects of federal actions on these populations, those effects would be identified and addressed. Environmental justice is achieved if minority and low-income communities are not subjected to disproportionately high or adverse environmental effects.

In 1997, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children)*, was issued to identify and address issues that affect the protection of children. Children may suffer disproportionately more environmental health and safety risks than adults because of a variety of factors, including children's neurological, digestive, immunological, and other bodily systems that are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's behavior patterns may make them more susceptible to pollution and accidents because they are less able to protect themselves; and children's sizes and weights may diminish their protection from standard safety features.

As shown on Table 3-12, the study area (Island and Skagit Counties) has a lower than national and state percentage of minority populations, and also a lower percentage of the population living below the poverty level. Island County likewise has a lower percentage of

children compared to either the national or state percentages. Skagit County is below the national percentage for child populations and equal to the state percentage.

Table 3-12 Baseline Minority, Low Income, and Child Populations

Jurisdiction	Total Population	Percent Population Total Minority	Percent Population Below Poverty Level	Percent Population Aged 19 or Younger
United States	308,745,538	27.6	15.3	30.0
Washington State	6,724,540	22.7	13.4	26.3
Island County	78,506	13.9	9.4	23.0
Skagit County	116,901	16.6	11.5	26.3

Source: U.S. Census Bureau, 2010 Census

Table 3-13 presents data on the minority, low-income, and children populations living underneath the baseline noise zones for NAS Whidbey Island. The affected population under these areas was determined using U.S. Census Bureau 2010 data to calculate the total affected area within each census bloc, and then used to proportion the percentage of the population affected for that area.

Table 3-13 Baseline Minority, Low Income, and Child Populations Underlying NAS Whidbey Island Noise Zones

Noise Zone (dB DNL)	Total Population	Percent Population Total Minority	Percent Population Below Poverty Level	Percent Population Aged 19 or Younger
65-70	4,743	37.9	8.8	24.5
70-75	2,843	28.1	8.7	23.6
75-80	2,789	21.8	8.1	24.3
80-85	209	17.7	13.3	21.1
85-90	34	20.6	17.6	23.5
>90	1	0	0	0

Source: U.S. Census Bureau, 2010 Census

¹ Minority is defined as individual(s) who are members of the following population groups: American Indian or Alaska Native; Asian; Native Hawaiian or Pacific Islander; Black or African American, not of Hispanic origin; or Hispanic.

3.10 Environmental Management

This section discusses ongoing environmental management and restoration programs at NAS Whidbey Island, including petroleum storage.

3.10.1 Regulatory Overview

NAS Whidbey Island is managing hazardous wastes and hazardous materials and substances and is remediating any contamination resulting from past operations in accordance with the following programs:

- **The Resource Conservation and Recovery Act (RCRA)** regulates the treatment, storage, transportation, handling, labeling, and disposal of hazardous waste. The Hazardous and Solid Waste Amendments of 1984 added the requirement for treatment, storage, and disposal facilities with permits issued after November 8, 1984, to include corrective actions.
- **The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** requires federal agencies to conduct any needed response actions to clean up contamination from past releases of hazardous substances causing an unacceptable risk to human health and the environment. The military complies with CERCLA under the Installation Restoration Program (IRP). This program is used to manage inactive hazardous waste sites and hazardous material spills.

3.10.1.1 Management of RCRA-Defined Hazardous Waste

NAS Whidbey Island is a large-quantity generator of hazardous waste, as defined by RCRA, a status applying to facilities generating 2,200 pounds (1,000 kilograms) or more of hazardous waste. In CY2008, NAS Whidbey Island generated 114,700 pounds of hazardous waste. Hazardous waste-generating activities for aircraft and vehicle repair and maintenance include painting; solvent-based cleaning and degreasing; mechanical and chemical paint and rust removal; fluids change-out; electroplating; metal casting; machining; and welding or soldering. If not consumed during use, these materials and possibly their containers eventually may be disposed of as a solid or hazardous waste. As required by Chapter 15, Paragraph 5.3, of OPNAVINST 5090.1C, the *Navy Environmental and Natural Resources Program Manual*, NAS Whidbey Island maintains a hazardous waste management plan to establish procedures and provide guidance regarding hazardous waste generation, accumulation, and disposal at the installation (Naval Facilities Engineering, Northwest 2009).

Hazardous wastes are accumulated at less-than-90-day satellite accumulation points throughout the station before being transferred to permitted storage facilities. These wastes are collected and stored on-site in accordance with NAS Whidbey Island's RCRA permit. The Defense Reutilization and Marketing Office is responsible for contracting for off-site disposal of most hazardous waste.

The DOD collects all annual hazardous- and solid-waste generation data for each Navy, Marine Corps, Army, and Air Force installation in order to track its progress in meeting its goals for waste reduction. Waste categories in the pollution prevention annual data summary are

defined by the source of the waste, such as a plating shop (electroplating and circuit-board manufacturing processes), fluids change (i.e., used solvents, hydraulic fluids, lubricants), facility operations (i.e., cleaning and maintenance, pest-management applications, used batteries), chemical paint-stripping, painting operations, and rust and coating removal.

3.10.1.2 Management of Hazardous Materials and Substances

NAS Whidbey Island uses hazardous materials and substances during aircraft and vehicle repair and maintenance and building and grounds maintenance. Materials used include petroleum, oils, and lubricants; solvents and thinners; caustic cleaning compounds and surfactants; cooling fluids (antifreeze); adhesives; acids and corrosives; paints; and herbicides, pesticides, and fungicides. Hazardous materials are controlled by Navy procedures such as OPNAVINST 5100.23G, *Navy Safety and Occupational Health (SOH) Program Manual*, and technical contracting requirements.

Asbestos-containing materials are subject to regulation under the federal Toxic Substances Control Act of 1976 (40 CFR 763) and by the State of Washington under its asbestos regulations (WAC Chapter 296-62 Part I-1).

Lead-based paint is commonly found in demolition debris (exterior painted wood, siding, window frames, and plaster) from buildings constructed before 1960. Once removed from a building, lead-based paint is typically managed as a hazardous waste and, as such, is subject to regulation by the EPA under its hazardous waste regulations (40 CFR 260 to 265). The State of Washington considers lead-based paint a potentially dangerous waste and regulates its disposal under WAC Chapter 173-303, *Dangerous Waste Regulations*.

Mercury is found in fluorescent light bulbs, neon bulbs, ultraviolet bulbs, and high-intensity discharge bulbs (used for outdoor lighting and in commercial buildings). Mercury is also found in older temperature- and pressure-measuring devices, clocks, switches, and other items. The Mercury Education and Reduction Act of 2003 banned the sale of most mercury-containing products and mandated labeling mercury-containing light bulbs. Mercury is regulated by the EPA under its hazardous waste regulations (40 CFR 260 to 265) and by the State of Washington as a dangerous waste under WAC Chapter 173-303.

Polychlorinated biphenyls (PCBs) are regulated under the Toxic Substances Control Act of 1976 (40 CFR Part 761). In Washington, PCBs are regulated as a dangerous waste under WAC Chapter 173-303. PCBs were used as coolants and lubricants in electrical transformers

manufactured between 1929 and 1977 and in fluorescent light ballasts manufactured through 1979 (U.S. Navy 2010a).

3.10.2 Installation Restoration Program Sites

Hazardous waste disposal sites at NAS Whidbey Island are investigated under the DOD's IRP, established in 1980, in compliance with the requirements of CERCLA for former waste sites and RCRA for sites associated with ongoing operations. The program's mission is to protect human health and the environment by identifying, characterizing, and cleaning up contamination on military installations resulting from formerly accepted use and disposal practices for hazardous waste.

NAS Whidbey Island has 23 sites in various stages of investigation and remediation under the IRP. No sites are located at or beneath Hangar 8, 10, or 12. The closest IRP site, northeast of the existing aircraft parking apron and runways and approximately 1,100 feet northeast of Hangar 10, is a complex of ditches consisting of approximately 9 miles of connected ditches and culverts draining the runway area and receiving discharges from many of the station's storm drains. Previous dumping and spills have contaminated the ditch sediments with total petroleum hydrocarbons, lead, arsenic, and pesticides. An ROD was signed in April 1995, and approximately 6,000 cubic yards of contaminated sediments were excavated from the ditch complex and disposed of before being capped. In May 1996, the Navy completed construction work, including restoration.