

# Joint Base Lewis-McChord (JBLM) Joint Land Use Study (JLUS)



## *Existing Conditions Report*

### *Final*

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SOUTH SOUND MILITARY &  
COMMUNITIES PARTNERSHIP

September 2015

# Existing Conditions Report

## Joint Base Lewis-McChord Joint Land Use Study

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### Executive Summary

The Joint Base Lewis-McChord (JBLM) Joint Land Use Study (JLUS) is a collaborative process among local, state, and regional jurisdictions; the public; federal, state, and regional agencies; and military installations within the South Puget Sound region of the State of Washington. The JLUS presents recommendations for consideration by local and state governments that promote development compatible with military presence and protecting public health, safety, and welfare while also protecting the ability of the military to accomplish its vital training and operational missions presently and over the long-term. The study is designed to create dialogue around the complex issues such as land use, economic development, infrastructure, environmental sustainability, and the operational demands and mission changes of military entities. The intent of the study is to highlight common interests such as economic growth, more efficient infrastructure, healthier environments, improved quality of life, and the protection of Department of Defense (DoD) and civilian investments and missions.

The Final JLUS Report will provide a series of recommendations to guide future decisions and policy actions by public agencies, military installations, and other partners. The purpose of the Existing Conditions Report is to summarize existing compatibility issues and identify other issues that may develop in the future under the current planning framework.

The JLUS study area is defined as the area within 2 miles of the JBLM installation boundary, as shown in Figure 1.1. The 2-mile study area encompasses the communities of Tacoma, Lakewood, University Place, Steilacoom, DuPont, and unincorporated areas within Pierce County; Lacey, Yelm, Rainier, Roy, and unincorporated areas within Thurston County; and the Nisqually Indian Reservation. Camp Murray, which is home to the Washington National Guard, is within the study area as well.

JBLM is the largest military installation on the west coast, encompassing over 90,000 acres including the main cantonment area (approximately 10,000 acres) and close-in training ranges (approximately 80,000 acres). JBLM is a major economic engine in Washington State and, as of 2012, is the second largest employer in the state and the largest employer in Pierce County. JBLM reports that, as of June 2015, the on-base population stands at 23,700. Region-wide, the JBLM-supported population, which includes full-time military, family members, and dependents; DoD employees; and civilian contractors; living on base and in neighboring communities, stands at more than 130,000.

A variety of information was reviewed, including population and economic data, JBLM plans and policies, local community comprehensive plans and development regulations, and environmental documents. Additional input was provided by stakeholders, Subject Matter Experts (SMEs), and the general public.

Upon review of this information, several key compatibility issues were identified:

- Incompatible land uses exist in the McChord Field North Clear Zone (NCZ) and Accident Potential Zones (APZs). Some private property has been acquired.
- Federally listed threatened and endangered prairie species and their habitat exist on and off installation. The need to manage this habitat presents an encroachment threat to military operations on base, while impacting use of land off base.

- Noise impacts from aircraft and training operations affect areas off the installation resulting in potentially incompatible land uses.
- Future urban growth (planned or projected) near the installation boundaries increases the possibility of future conflicts.
- Regional transportation impacts continue as both JBLM and the region have experienced growth.
- Trespass and unauthorized use of JBLM training lands threatens the training mission of the base and the safety of soldiers and civilians. Continued management of JBLM training lands is needed to limit unauthorized uses while permitting authorized, compatible public uses.
- There is a need to maintain and increase communication among JBLM and the surrounding communities.

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### Acronyms and Abbreviations

65 Ldn	65 decibel, day-night average sound level
AC1	Air Corridor 1
AC2	Air Corridor 2
ACUB	Army Compatible Use Buffer
ADPs	Area Development Plans
AIA	Artillery Impact Area
AICUZ	Air Installation Compatible Use Zone Study
AIR	Airport Overlay
APZs	Accident Potential Zones
AR	Army Regulation
BASH	Bird/Wildlife Aircraft Strike Hazard
BEA	U.S. Bureau of Economic Analysis
BMPs	best management practices
BNSF	Burlington Northern-Santa Fe
BRAC	Base Realignment and Closure Commission
CAB	Combat Aviation Brigade
CAO	critical areas ordinance
CNLM	Center for Natural Lands Management
CZ	Clear Zone
dB	decibel
DHR	Directorate of Human Resources
DIN	dissolved inorganic nitrogen
DNL	Day-Night Average A-Weighted Sound Level
DoD	Department of Defense
DPS	Distinct Population Segment
DPTMS	Directorate of Plans, Training, Mobilization, and Security
DPW	Directorate of Public Works
EIS	Environmental Impact Statement
EOC	Elected Officials Council
ESMPs	Endangered Species Management Plans
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
FR	Federal Register
FY	Fiscal Year
GAAF	Gray Army Airfield
GMA	Growth Management Act
GSA	General Services Administration
HCP	Habitat Conservation Plan
HQ	Headquarters
HTAs	Helicopter Training Areas
I-5	Interstate 5
IDP	Installation Development Plan
IMCOM	Installation Management Command
INRMP	Integrated Natural Resources Management Plan
IONMP	Installation Operational Noise Management Plan
JBLM	Joint Base Lewis-McChord

JLUS	Joint Land Use Study
LUPZ	Land Use Planning Zone
MIA	Military Influence Area
ML	Military Lands
MPP	Multi-county Planning Policy
MR	Military Reservation
MWR	Morale, Welfare, and Recreation
NCZ	North Clear Zone
NEPA	National Environmental Policy Act
NGO	non-governmental organization
NLR	noise level reduction
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NZ	Noise Zones
OEA	Office of Economic Adjustment
PAO	Public Affairs Office
PHAM	Prairie Habitat Assessment Methodology
PSRC	Puget Sound Regional Council
RCMP	Range Complex Master Plan
REPI	Readiness and Environmental Protection Integration
RFP	Request for Proposals
RLM	Rural Military Lands
RWDS	reclaimed water distribution system
SHARP	Species and Habitat Asset and Risk Prioritization
SME	subject matter expert
SPP	Sustainability in Prisons Program
SPSSEG	South Puget Sound Salmon Enhancement Group
SR 18	State Route
SSMCP	South Sound Military and Communities Partnership
TA	Training Area
TRPC	Thurston Regional Planning Council
TWG	Technical Working Group
U.S.C.	United States Code
UAS	Unmanned Aircraft System
UGAs	urban growth areas
UML	Urban Military Lands
USDA	U.S Department of Agriculture
USDOI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance
VA	Veterans Administration
WADS	Western Air Defense Sector
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WWTP	wastewater treatment plant
YTC	Yakima Training Center



## 1. Study Purpose and Background

### 1.1. Study Purpose and Goals

The Joint Base Lewis-McChord (JBLM) Joint Land Use Study (JLUS) is a collaborative process among local, state, and regional jurisdictions; the public; federal, state, and regional agencies; and military installations within the South Puget Sound region of the State of Washington. The JLUS presents recommendations for consideration by local and state governments that promote development compatible with military presence and protecting public health, safety, and welfare while also protecting the ability of the military to accomplish its vital training and operational missions presently and over the long-term. The study is designed to create dialogue around complex issues such as land use, economic development, infrastructure, environmental sustainability, and the operational demands and mission changes of military entities. The intent of the study is to highlight common interests such as economic growth, more efficient infrastructure, healthier environments, improved quality of life, and the protection of Department of Defense (DoD) and civilian investments and missions.

The JLUS process emphasizes coordination and communication as a way to strengthen the relationship among the study area partners and to build a framework for successful implementation and monitoring of recommendations around shared goals. The Final JLUS Report will provide a series of recommendations to guide future decisions and policy actions by public agencies, military installations, and other partners. Recommendations are not binding, but participants are asked to make a good faith effort to implement those recommendations.

The overall goals of the JLUS are to:

- Clearly establish a Military Influence Area (MIA) that considers jurisdictional boundaries, economic influences, environmental assets, and multimodal transportation routes, including those to major ports.
- Jointly analyze the factors that can restrict range and training missions as a result of incompatible land use development adjacent to JBLM.
- Increase engagement and communication among JBLM, local jurisdictions, and property owners to address the long-standing issue of encroachment in the North Clear Zone (NCZ) of McChord Field.
- Cooperatively develop a set of recommendations that encourage land uses that are compatible, acceptable, and feasible for land in the vicinity of military airfield ranges, including aircraft Accident Potential Zones (APZs) and areas affected by noise.
- Protect the public health, safety, and welfare of the civilian and military communities by promoting safe and compatible growth.
- Provide for increased engagement and communication among the following entities in all stages of the planning process: JBLM and other local military facilities; federal, state, county, and municipal government agencies; Tribes; landowners; and other interested parties.
- Continue to strengthen the highly successful role that the South Sound Military and Communities Partnership (SSMCP) has played in encouraging regional communication and cooperation, and use this existing structure as an enduring forum for cooperative land use planning and implementation of study recommendations.
- Address community concerns with noise associated with the installation's aircraft operations and missions, which evolve over time.

- Define military installation compatibility within the context of the Washington State Growth Management Act (GMA) and leverage the ongoing planning efforts of local communities to implement JLUS recommendations in their upcoming comprehensive plan updates.
- Seek creative solutions that preserve habitat for threatened and endangered species while preserving range and training capabilities, including building upon the JBLM Readiness and Environmental Protection Integration (REPI) Sentinel Landscapes challenge project and the Army Compatible Use Buffer (ACUB) program.
- Develop an implementation plan that applies land use planning and policy tools, strategies, and techniques that fairly allocate land use impacts with respect to federal, state, and local governments; private landowners; and the military community.

## **1.2.Purpose of Existing Conditions Report**

To establish a baseline for the broader planning context, an initial step of the JLUS planning process was to analyze existing conditions in the study area. The purpose of the Existing Conditions Report is to summarize existing compatibility issues and identify other issues that may develop in the future under the current planning framework. Research for the Existing Conditions Report focused on a review of the following:

- Community growth and land use patterns.
- Current and foreseeable military missions.
- Current land use policy and regulatory measures.
- Stakeholder and subject matter expert input.

The publication of this Existing Conditions Report completes Phase I of the JLUS process. Issues or topics identified in this report as needing further study will become the focus of Phase II of the process, the Compatibility Analysis.

## **1.3.Study Area**

For the purposes of this report, the JLUS study area is defined as the area within 2 miles of the JBLM installation boundary, as shown in Figure 1.1. The 2-mile study area encompasses the communities of Tacoma, Lakewood, University Place, Steilacoom, DuPont, and unincorporated areas within Pierce County; Lacey, Yelm, Rainier, Roy, and unincorporated areas within Thurston County; and the Nisqually Indian Reservation. Camp Murray, which is home to the Washington National Guard, is within the study area as well. The Yakima Training Center (YTC), which is under the administration of JBLM, is not considered within the study area.

## **1.4.Formal Study Partners**

The JBLM JLUS is made possible through a grant from the DoD Office of Economic Adjustment (OEA) to the City of Lakewood and coordinated by the SSMCP. The study area is a geographically large and diverse region, featuring a complex pattern of land tenure statuses combined with varied economic and resource interests, and multiple operational and mission needs. To reflect this complexity, a wide array of partners will be involved in the study process, including but not limited to:

- DoD OEA
- JBLM Headquarters and staff
- Washington State Department of Commerce
- Nisqually Indian Tribe
- Thurston Regional Planning Council (TRPC)

- Pierce County
- Thurston County
- City of DuPont
- City of Lacey
- City of Lakewood
- City of Rainier
- City of Roy
- Town of Steilacoom
- City of Tacoma
- Tacoma-Pierce County Chamber
- Tacoma-Pierce County Health Department
- City of Yelm

The JLUS is an inclusive, community-driven process designed to engage residents, local businesses, landowners, and others beyond the list of formal study participants. The JLUS is being conducted to identify strategies that enable meaningful input from the broadest possible cross-section of stakeholders and affected communities.

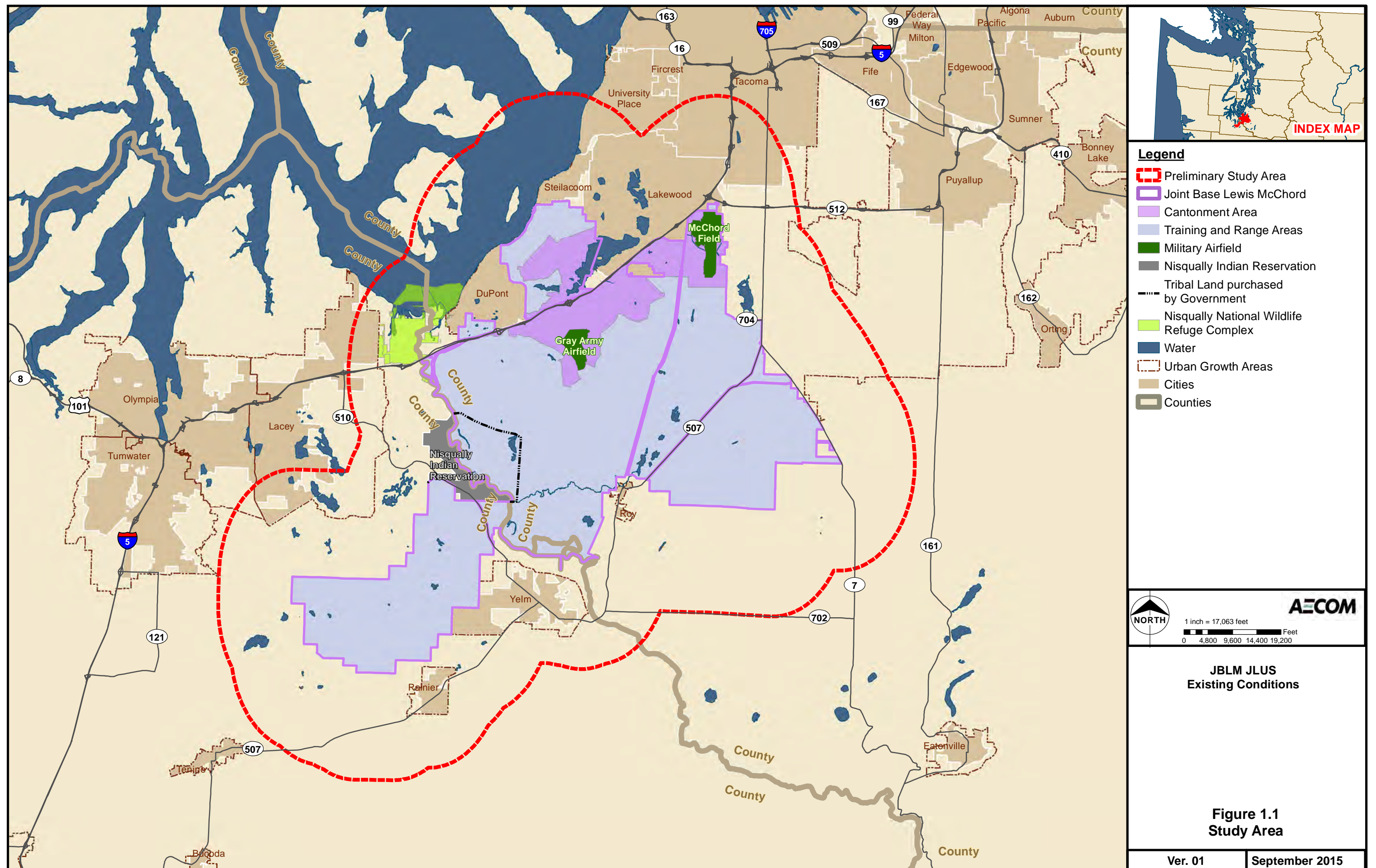
### **1.5. JLUS Committees**

JLUS stakeholders are organized into three levels of formal engagement, as follows: the JLUS Subcommittee (Subcommittee) of the SSMCP, the Technical Working Group (TWG), and the Elected Officials Council (EOC). This Existing Conditions Report was prepared with the input and guidance of these groups.

### **1.6. Stakeholder and Public Engagement**

In addition to the input gathered during committee meetings, information was solicited from various stakeholders, Subject Matter Experts (SMEs), and the general public. Individual interviews were conducted with stakeholders and SMEs, a small group meeting was held with the Nisqually Indian Tribe, and three public open houses were held. These efforts, and the issues and concerns identified as a result, are summarized in Chapter 9 of this report.





## 2. Initial Compatibility Issues

Several initial compatibility issues have been identified thus far during the course of this study. These issues were identified through three primary sources. Several issues were identified during the previous JLUS (the 1992 Fort Lewis and McChord Air Force Base JLUS) and remain as significant compatibility challenges. The Request for Proposals (RFP) for the current JLUS identified four primary issues intended to be the focus of the current study. Two other issues were raised through the stakeholder and public engagement process of this study, while the issue of transportation impacts is an ongoing issue that is primarily addressed by other studies and is not the focus of this JLUS. Table 2.1 identifies these initial compatibility issues and summarizes their status.

Table 2.1. Initial Compatibility Issues.

Issue	Source
Incompatible existing land uses in the McChord Field NCZ and APZs.	1992 JLUS/JLUS RFP
Federally listed threatened and endangered prairie species and habitat on and off installation.	JLUS RFP
Noise impacts from aircraft and training operations.	1992 JLUS/JLUS RFP
Future urban growth (planned or projected) near the installation boundaries.	JLUS RFP
Regional transportation impacts.	1992 JLUS/JLUS RFP
Trespass and unauthorized use of JBLM training lands.	Public/stakeholder input
Need to maintain and increase communication among JBLM and communities.	1992 JLUS and public/stakeholder input

### 2.1. 1992 McChord Air Force Base and Fort Lewis JLUS

In 1992, a JLUS was completed for Fort Lewis and McChord Air Force Base. During the more than 20 years since that study, the two military installations have formed a joint base and grown considerably, missions have changed, and significant urban growth has occurred in the region. While some specific compatibility issues addressed in the previous study are no longer relevant, there are several persistent issues.

The 1992 JLUS resulted in several successful implementation actions. Most significantly, both Pierce County and the City of Lakewood have addressed land use impacts related to JBLM within their comprehensive plans and development regulations, particularly with regard to land uses in the McChord NCZ and APZs. Acquisition of private property by the U.S. Air Force within the NCZ and APZs has occurred to mitigate the presence of incompatible land uses. However, incompatible land uses still exist, regional transportation impacts continue to pose a significant challenge, and noise impacts remain as missions have evolved. The following discussion summarizes the 1992 JLUS and the status of the identified compatibility issues.

The 1992 JLUS examined issues and made recommendations relating to seven topic areas:

- Aircraft Safety
- Aircraft Noise
- Training and Artillery/Small Arms Safety
- Artillery Noise
- Circulation
- Growth Management
- Communication

Of the compatibility issues identified in the 1992 study, those with the most relevance to this current study relate to:

- Development in NCZ and APZs
- Aircraft Noise & Artillery Noise
- Circulation
- Growth Management
- Communication

#### Development in NCZ and APZs

The McChord Field NCZ, is a 3,000 by 3,000 foot zone at the end of the runway where there is the highest statistical possibility of aircraft accidents. Development should be prohibited in this zone. However, pre-existing private development exists in the NCZ, including some industrial uses and storage condominium units.

The 1992 JLUS recommended two complementary approaches to this issue:

- Use public funds to acquire private property.
- Apply zoning restrictions to limit incompatible development.

The City of Lakewood has recognized the NCZ and instituted zoning controls to limit incompatible development. Lakewood's zoning and development regulations are described in further detail later in this report (see Section 6.3).

Funding acquired through the DoD Readiness and Environmental Protection Integration (REPI) program, along with other funding from the State of Washington, Pierce County, and the cities of Lakewood and Tacoma, has been used to acquire seven parcels (out of 36 total) as well as 27 condominium storage units (out of 49 total). These parcels have been transferred to Pierce County ownership.

#### Aircraft Noise & Artillery Noise

The existence of noise impacts on surrounding communities resulting from aircraft operations and artillery firing and other training operations is an intrinsic characteristic of military installations and was noted as a key compatibility issue in 1992.

Recommendations of the 1992 JLUS included:

- Zone to limit noise-sensitive uses in high noise zones.
- Limit night operations.
- Evaluate flight routes.
- Provide public notifications.
- Encourage noise attenuation measures in new construction.
- Encourage real estate disclosures of noise impacts.

Since that time, a number of steps have been taken both on and off the installation. JBLM has an established public notification system of potential noise impacts, managed by the Joint Base Headquarters (HQ). Some limits have been placed on night training activities. Flight routes have generally been established to minimize noise impacts. In neighboring communities, there are inconsistent requirements for noise impact disclosures or noise attenuation requirements for new construction.

#### Circulation

The Interstate 5 (I-5) corridor is the primary transportation artery in the region, with JBLM and densely developed population centers clustered along the corridor. Traffic circulation was identified as a compatibility issue in 1992 and has continued to present a challenge as both JBLM and the surrounding communities have continued to grow.

The 1992 JLUS recommended:

- Improving freeway interchanges.
- Including JBLM in regional transportation planning efforts.

Ongoing I-5 corridor work is addressing interchanges, base access, and including JBLM as a partner in regional transportation planning.



### Growth Management

The 1992 JLUS addressed growth management planning as a key issue and potential tool for mitigating compatibility challenges.

Recommendations included:

- Consider JBLM as an affected agency for land use planning decisions.
- Periodic meetings between military and local, state, and federal elected officials.
- Military should provide statistical data to local planners.

Since 1992, JBLM has been a proactive partner in engaging local communities in planning efforts, while the SSMCP has provided an invaluable forum for regional communication and cooperation.

### Communication

The 1992 JLUS noted the importance of communication between the installation and the surrounding community. The JLUS recommended that the installation expand their public information program. Today, JBLM has an active public information program through the JBLM HQ Public Affairs Office (PAO).

## **2.2. McChord Field North Clear Zone**

While some progress has been made on the issue of incompatible private development in the McChord Field NCZ, as noted above, the issue has not been fully resolved and remains one of the primary compatibility issues for this study.

## **2.3. Threatened and Endangered Species**

The presence of several federally listed threatened or endangered species on JBLM and in the study area presents a significant compatibility challenge. Several species of anadromous fish occupy habitat in the Nisqually River, in the Puget Sound, and in several other fish-bearing streams on and off the installation, including Chambers Creek, the Sequim Creek watershed, and others. Protection of these species has direct impacts for land uses adjacent to fish-bearing streams as well as indirectly through water quality impacts at a watershed scale. For example, stormwater management on and off the installation is affected by the need to protect fish habitat, as are projects with regional impacts such as a proposed new wastewater treatment plant at Solo Point.

In 2013 and 2014, three prairie species were listed as threatened or endangered: the Mazama pocket gopher, Taylor's checkerspot butterfly, and streaked horned lark. These prairie species present perhaps the most critical compatibility challenge to the installation. Suitable native prairie habitat is concentrated on JBLM range and training lands. The presence of native prairie off installation represents a challenge for private landowners. Mitigating threats to these species will require cooperative actions by multiple area stakeholders, including JBLM, local jurisdictions, Tribes, private landowners, and nonprofit organizations.



## **2.4.Noise Impacts**

Noise impacts on surrounding communities resulting from aircraft operations and training activities continue to exist, although the issue is generally well-managed by limiting the extent and timing of activities, and through public notification through the JBLM PAO.

## **2.5.Urban Growth**

JBLM is located in a rapidly urbanizing region with significant growth potential, especially near the southern and eastern installation boundaries. Urban growth near a military installation is an inherent compatibility challenge. More development and more population near an installation increase the likelihood that conflicts will occur over noise impacts, traffic, incompatible development, or environmental impacts. Such conflicts can present a threat to the military mission, if training and other operations are curtailed to minimize real or perceived conflicts with the quality of life of neighboring residents.

## **2.6.Regional Transportation Impacts**

Regional transportation impacts continue to be a challenge. Several ongoing studies and construction projects are occurring along the I-5 corridor. Transportation is not the focus of this study because of these separate efforts. However, the connection between transportation and land use will continue to be assessed as this study progresses.

## **2.7.Trespass and Unauthorized Use of JBLM Training Lands**

Comments received during the three public open houses conducted in the initial phase of this study revealed that public uses of JBLM range lands are a potentially important consideration. JBLM actively manages its extensive, unfenced range and training lands to allow certain public uses based on a system of permits and general authorizations. Such uses include hunting, horseback riding, hiking, and other recreational uses. Unauthorized uses also pose a problem, in particular illegal dumping and illicit drug manufacturing. The maintenance of authorized public uses will not only continue to provide benefits to the neighboring communities, but can also help to minimize unauthorized uses. For instance, authorized users can spot illegal uses, help to clean up trash, and act as stewards for range lands, when they are not in use for training activities. Public uses of JBLM training lands pose burdens and risks to the military, however. The military lacks personnel to patrol public uses and is at risk in the event of public accidents or injury on federal land.

## **2.8.Regional Communication and Cooperation**

The need for continued, effective regional communication and cooperation is a key overarching consideration of this study. The SSMCP has played an invaluable role in providing a forum for communication and cooperation regarding military related issues. The SSMCP will continue to play a vital role as the JLUS recommendations are implemented. JBLM has been a proactive partner with the surrounding community and must continue to communicate with its neighbors through a variety of means.

### 3. Study Area Profile

#### 3.1. Study Area Description

The JLUS study area is situated within the south Puget Sound region and encompasses a diverse geographic area. The study area is bisected by I-5, the major transportation corridor in western Washington. The western portion of the study area is characterized by a high degree of urbanization and population density. The eastern and southern portions of the study area contain rural areas, including agricultural and residential areas, forested and prairie land, several small urban areas, and the Nisqually Indian Reservation. A diversity of natural areas exists throughout the study area, including Puget Sound itself, and the Nisqually National Wildlife Refuge.

#### 3.2. Regional and Community Population Trends

The south Puget Sound region has experienced rapid population growth, as indicated in Table 3.1 and depicted on Figure 3.1. The region is expected to continue to grow, with a more than 30% population increase over 2010 levels by 2040, as indicated in Table 3.2. The majority of the population within the study area is clustered around the I-5 corridor, as shown on Figure 3.2.

Table 3.1. Population Change Since 2000.

	Population 2000	Population 2010	% Change
<b>JBLM</b>	19,089*	23,700**	24.2%
<b>Washington (State)</b>	5,894,143	6,724,540	14.1%
<b>Pierce County</b>	700,818	795,225	13.5%
<b>DuPont</b>	2,452	8,199	234.4%
<b>Lakewood</b>	58,211	58,163	-0.01%
<b>Roy</b>	260	793	205.0%
<b>Steilacoom</b>	6,049	5,985	-1.1%
<b>Tacoma</b>	193,556	196,800	1.7%
<b>Thurston County</b>	207,355	252,264	21.7%
<b>Lacey</b>	31,226	42,393	35.8%
<b>Olympia</b>	42,514	46,478	9.3%
<b>Tumwater</b>	12,698	17,371	36.8%
<b>Yelm</b>	3,289	6,848	108.2%

Source: U.S. Census Bureau

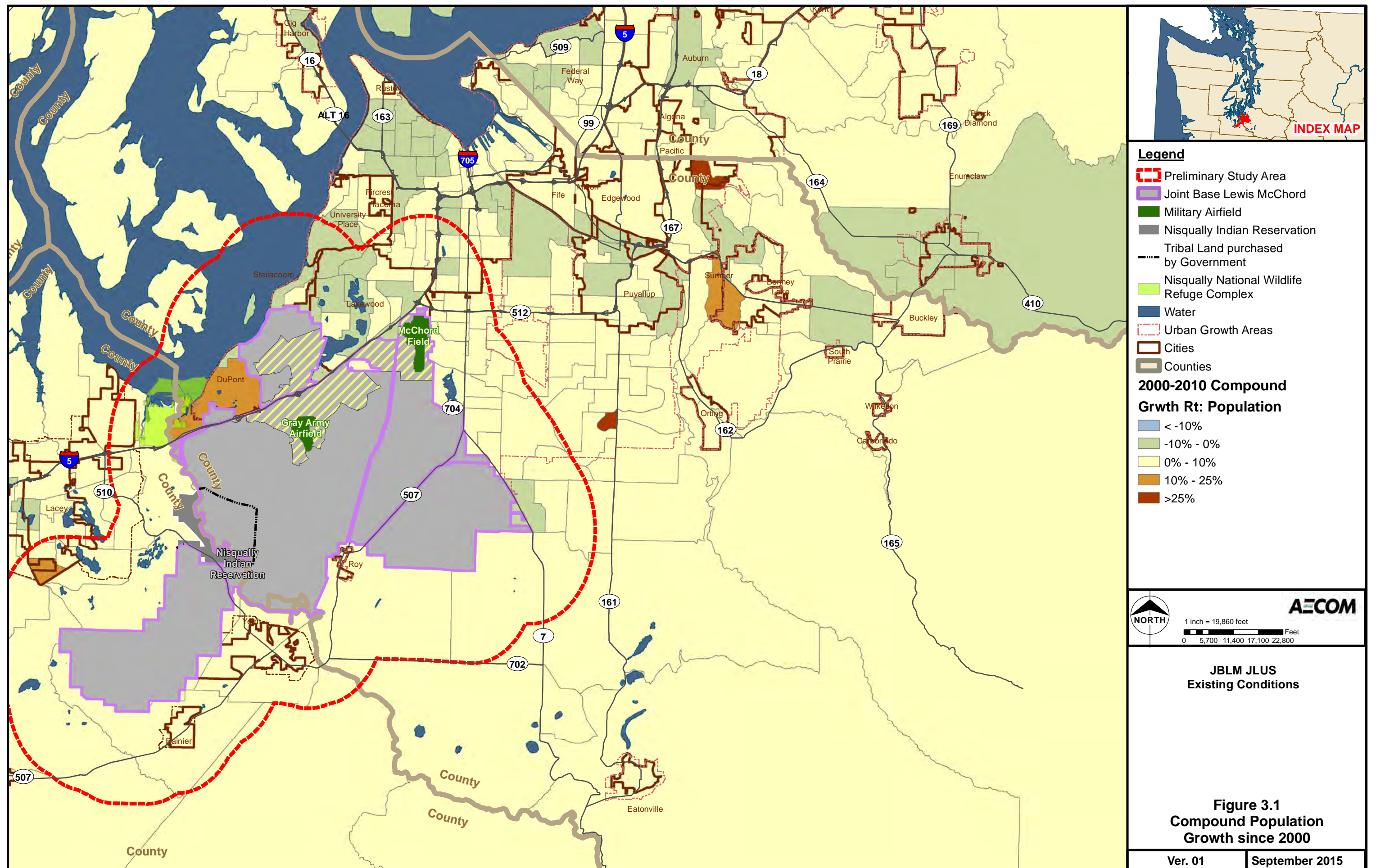
\*Source: U.S. Census Bureau. 2000 on-base population.

\*\*Source: JBLM. 2015 on-base population.

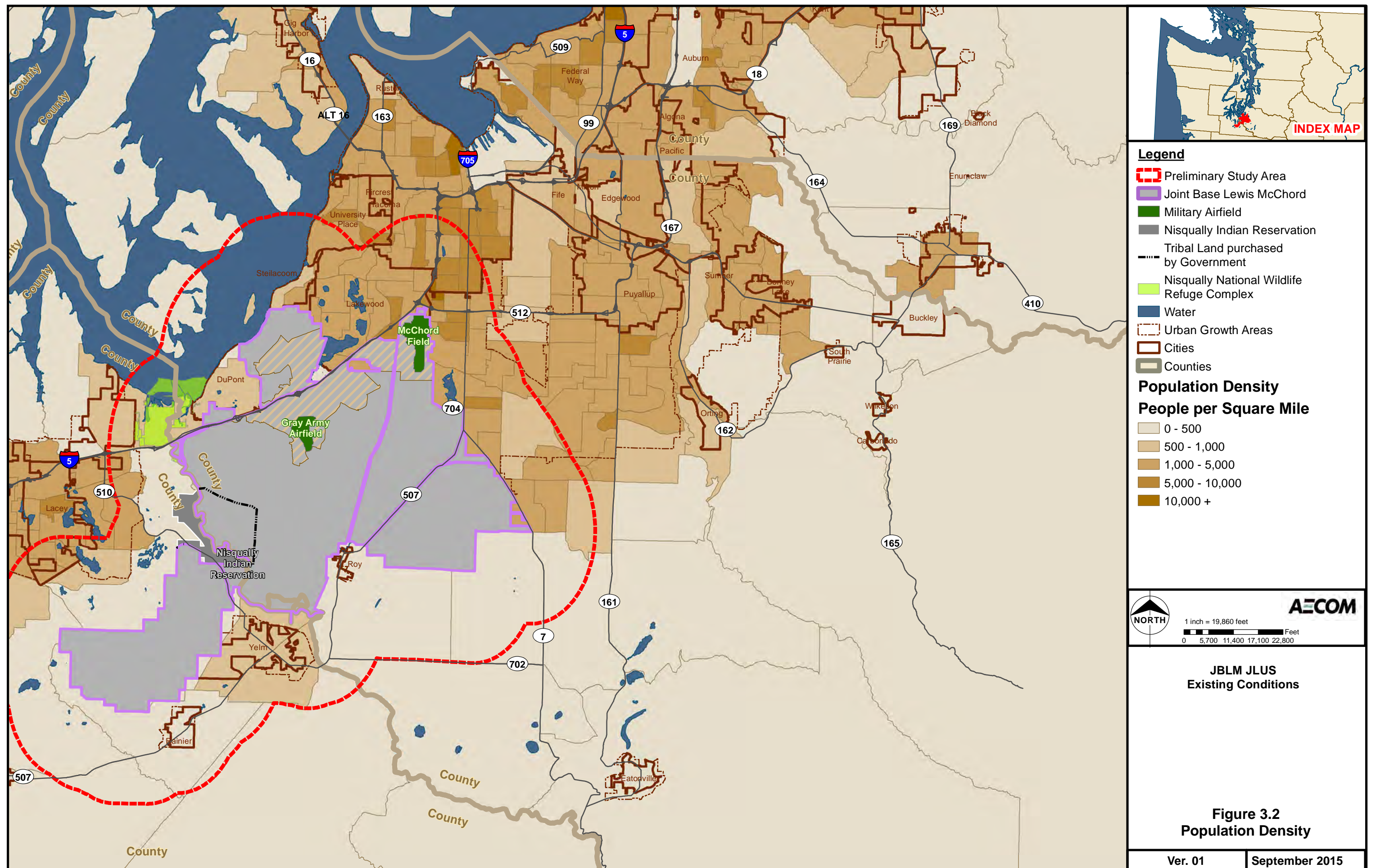
Table 3.2. Population Projections.

	Population 2020	Population 2030	Population 2040	% Change 2010- 2040
<b>Washington (State)</b>	7,411,977	8,154,193	8,790,981	30.7%
<b>Pierce County</b>	876,565	967,601	1,042,341	31.1%
<b>Thurston County</b>	288,265	326,426	358,031	41.9%
Source: Washington State Office of Financial Management				









### 3.3.Existing Land Use

Buildable lands analyses for Pierce and Thurston counties were reviewed to provide a baseline understanding of existing land uses and future development capacity. These analyses are summarized below.

#### 3.3.1. Pierce County

Pierce County adopted urban growth areas (UGAs) in accordance with the Washington State GMA. The UGAs must be of sufficient size to accommodate the anticipated population growth for 20 years following adoption. The UGAs reflect local comprehensive plans, urban population forecasts, and population capacity analyses. Pierce County Countywide Planning Policies specifically address the sizing of the urban growth boundary, the allocation of the projected housing need, and appropriate average density within the UGAs, along with complementary guidance, including efficient land use patterns and the conservation of natural resources.

The Buildable Lands Program is a collaborative effort among Pierce County and its 23 cities and towns to collect and assess annual development permitting data and wetlands and steep slope information, and to inventory developable land. The County's analysis encompassed unincorporated lands, while the cities' and towns' analyses focused on the lands within their respective municipal boundaries. The program evaluates two aspects of growth management – accommodating projected population growth during the 20-year planning period, and ensuring the availability of commercial and industrial land to support employment activity.

The County has adopted targets for housing units and jobs needed to accommodate projected population increases. The housing and jobs targets are compared to the projected land use capacity for future housing and employment growth to identify whether the targets can be met. The overall analysis demonstrates that the adopted UGA offers sufficient capacity to meet the 2030 urban housing and employment targets for the County and its incorporated communities. Pierce County needs 115,483 additional housing units to accommodate the 2030 urban housing target, while the estimated housing capacity equals 184,962. To satisfy its 2030 total urban employment target, the County needs 160,885 additional jobs compared to an estimated employment capacity of 319,386.

The analysis, however, notes that 10 jurisdictions may need to adopt “reasonable measures” to correct inconsistencies between housing/employment targets and estimated growth capacity. The report identifies housing capacity deficiencies in the cities of DuPont and Roy and employment-related capacity shortfalls in the cities of Lakewood and University Place. While the analyses indicate that these jurisdictions fall short of accommodating their growth targets, the excess capacity in many other jurisdictions more than compensates for the individual jurisdiction deficits, when considering the County as a whole.

The report also notes that the adopted 2030 housing and employment targets and assumptions applied in the housing and employment capacity analyses reflect a redirection of growth through redevelopment and higher density residential projects in cities and towns.



Development activity also generally indicates that the market is constructing urban density housing within the UGA.

The overall adequacy of capacity in the Pierce County UGA and the trend of redevelopment and higher density growth suggest that the County and its municipalities have flexibility to absorb future growth.

### **3.3.2. Thurston County**

The 2014 Buildable Lands Program for Thurston County addresses three key growth-related issues:

- If residential development in the UGAs is occurring at the densities envisioned in local comprehensive plans.
- The adequacy of land supply in the UGAs to accommodate anticipated population growth.
- The adequacy of land supply in the UGAs to meet future growth in employment.

The report also highlights related countywide planning policies that seek to concentrate development in growth areas through infill, phasing urban development outward from core areas, establishing mechanisms to ensure sufficiently high average residential densities, and designating rural areas for low intensity uses.

Thurston County is approximately 735 square miles, including water bodies. As of March 2014, 6.6 percent of this land area is vacant. Another 23 percent is in residential uses but development density could increase over time. Almost 15 percent of land is in forest or agriculture uses, but is zoned to allow for future residential development.

The south Puget Sound is one of the fastest growing areas in the State of Washington. Thurston County expects an additional 120,000 people by 2035, a high growth rate sustained by a stable economy, quality of life, a lower cost of living compared to areas closer to the center of the Seattle metropolitan area, and major employers such as JBLM. The County also anticipates adding another 60,000 jobs by 2035. The County will add about one-third of its future jobs and housing over the next 20-years, indicating the potential for a dramatic transformation of the built environment.

The analysis demonstrates that the land supply is sufficient to accommodate population growth in Thurston County's urban areas, and that each urban jurisdiction has designated an adequate amount of land to meet the projected 2035 residential population. The report notes, however, that federal endangered species listings could affect the available supply of land. The results also highlight that there is enough vacant, partially used, or redevelopable land to support the employment growth forecast.

In terms of its overall development patterns, Thurston County urban jurisdictions are achieving urban densities greater than the rule of thumb threshold of four dwelling units per acre. This

threshold is identified by the state as a minimum development density that must be met to support growth management goals. Close to one-third of Thurston County's households live in the rural areas. However, the trend of housing development in rural areas has decreased as more development is focused in urban areas.

The overall adequacy of capacity in the Thurston County UGA and the trend of concentrated development suggest that the County and its municipalities have flexibility to absorb future growth.

### 3.4.Economic Profile

Table 3.3 summarizes employment characteristics in the study area. State and local governments, retail trade, and health care and social services are major employers in both counties. The per capita average income in Pierce and Thurston counties in 2010 was \$40,500 and \$40,736, respectively, as compared to an average income of \$42,589 in Washington State.

Table 3.3. Employment in Washington State, Pierce County, and Thurston County.

Employment by Industry, Number of Jobs	Washington State	Pierce County	Thurston County
Direct JBLM Employment*	75,043	-	-
Farm employment	83,537	1,846	1,846
Non-farm employment	3,710,031	378,675	127,443
Forestry, fishing, and related activities	36,226	947	929
Mining	6,779	416	114
Utilities	5,300	685	180
Construction	200,663	23,255	5,623
Manufacturing	277,335	18,129	3,099
Wholesale trade	133,450	12,397	3,245
Retail trade	383,760	39,149	14,658
Transportation and warehousing	108,207	12,398	2,311
Information	113,007	3,667	1,284
Finance and insurance	166,015	14,972	4,605



Employment by Industry, Number of Jobs	Washington State	Pierce County	Thurston County
Real estate and rental and leasing	173,021	17,259	5,473
Professional, scientific, and technical services	272,870	16,582	6,854
Management of companies and enterprises	34,261	1,009	730
Administrative and waste management services	186,278	18,803	5,381
Educational services	69,909	7,064	2,669
Health care and social assistance	384,753	43,411	14,365
Arts, entertainment, and recreation	90,052	7,358	2,752
Accommodation and food services	240,984	23,041	8,270
Other services, except public administration	195,140	21,377	7,375
Government and government enterprises	632,021	96,756	37,526
Federal, civilian	75,691	13,201	1,009
Military	81,698	37,547	812
State and local government	474,632	46,008	35,705
State government	151,725	11,791	24,276
Local government	322,907	34,217	11,429

Source: U.S. Bureau of Economic Analysis (BEA) 2012

\*Source: JBLM Department of Public Works. 2013 data includes all on-installation employment (military & civilian).

JBLM is a major economic engine in Washington State and, as of 2012, is the second largest employer in the state and the largest employer in Pierce County. The economic impact of JBLM includes wage and salary payments to military and civilian employees, construction contractor payments, and operating costs such as rent and lease payments for various types of equipment, utilities, telephone services, office supplies, and non-construction contracts. It is estimated that

70-75 percent of JBLM Soldiers live off base, bringing large revenue and jobs to surrounding communities.

The Washington Economic Development Commission conducted an analysis in 2010 to determine the economic impact of Washington's military bases and defense-related economy, identify new and emerging business opportunities, and build on the state's significant military presence.

According to the report, installation spending in 2009 resulted in an estimated \$8.5 billion of economic activity within Washington State, including payroll, contracts, pensions, and other expenditures. DoD contracting produced an estimated \$3.7 billion in total output. The total defense activity created nearly \$12.2 billion in total output in the state and supported approximately 191,600 jobs and nearly \$10.5 billion of labor income. At JBLM specifically, payroll and other expenditures equaled \$3.5 billion in 2009. In the same year, businesses in Pierce County also received \$862,361,235 in defense contracts.

Aside from quantifiable economic impacts, military-related activity provides numerous benefits to the state and regional economies, including generating employment opportunities for a wide range of individuals, providing skilled workers in the form of retiring military personnel, creating supplementary markets for firms whose principal focus is not defense, offering relative insulation from the volatility of market demand, and spurring technological innovation.

## 4. JBLM Profile

### 4.1. Installation Profile

Joint Base Lewis-McChord (JBLM) was formally established in 2010, combining Fort Lewis and McChord Air Force Base into a single administrative unit. JBLM is home to the U.S. Army I Corps and 7<sup>th</sup> Infantry Division, the U.S. Air Force 62<sup>nd</sup> Airlift Wing, Madigan Army Medical Center, 1<sup>st</sup> Special Forces Group, U.S. Navy and U.S. Marine Corps elements, and other commands and tenant organizations. JBLM reports that, as of June 2015, the on-base population stands at 23,700. Region-wide, the JBLM-supported population, which includes full-time military, family members, and dependents; DoD employees; and civilian contractors; living on base and in neighboring communities, stands at more than 130,000. JBLM is the largest military installation on the west coast, encompassing over 90,000 acres including the main cantonment area (approximately 10,000 acres) and close-in training ranges (approximately 80,000 acres). There are two airfields on the installation: McChord Field, which is home to C-17 transport fleet, and Gray Army Airfield (GAAF), which supports mainly helicopter operations. JBLM has a rail loading complex that connects to the Burlington Northern-Santa Fe (BNSF) line. The training lands on JBLM include 115 live-fire training ranges. Convoy routes to YTC use I-5 to State Route (SR 18) to I-90 to I-82. The ports of Olympia, Tacoma, and Seattle provide deep water seaport capabilities. Figure 4.1 depicts land use on the installation.

JBLM is a premier power projection platform with many strategic advantages, including its location on the Pacific Rim, home to the I Corps and its historical Asia/Pacific focus, deep water port access, global airlift capabilities, and extensive training ranges.

The topography of the base allows troops to train in both hilly and flat terrain. Forests provide the dense vegetation needed for concealment, while grasslands and oak woodlands provide open areas for equipment, smoke, artillery, and maneuvers training. The Nisqually River provides suitable conditions for training in river crossing maneuvers, while the Puget Sound coastline at Solo Point is used for amphibious maneuvers. Water drops and pickups involving personnel and equipment are conducted in Puget Sound and at American, Sequelitchew, and Lewis Lakes.

JBLM shares borders with Camp Murray (Washington Army National Guard) and the American Lake Veterans Administration (VA) Hospital. The Yakima Training Center (YTC) encompasses over 300,000 acres of range and training lands in central Washington. YTC is considered a sub-installation of JBLM, but is outside the scope of this JLUS.



## 4.2. Current Mission

JBLM's mission is to:

- Provide state-of-the-art training and infrastructure, responsive quality of life programs, and fully capable mobilization and deployment operations for the Army, Navy, Air Force, and Marines.
- Manage resources efficiently and equitably to support mission readiness and execution, and the well-being of service members, families, and civilians.
- Sustain and protect the environment as a fully integrated community partner in the lower Puget Sound, with a highly trained and motivated workforce.

## 4.3. History

### Fort Lewis

Fort Lewis began as a gift of land from the Pierce County electorate in 1917 for use as a military training camp for Soldiers entering World War I. On May 26, 1917, Captain David L. Stone and his staff arrived to begin initial construction of "Camp Lewis," named after Captain Meriwether Lewis of the famed Lewis and Clark expedition. In 1924, Congress authorized the permanent construction of facilities and renamed the encampment Fort Lewis. During this period of construction, the principles of landscape architects Frederick Law Olmsted, Jr. and George B. Ford were used to develop the land. They created the area now called the Historic Downtown, or the garrison, as well as the parade field and close-in housing areas.

In 1936, Brigadier General David L. Stone, who as a Captain had supervised the original construction of Fort Lewis, returned to the site as Commanding General. During the next several years, an Army airfield (later McChord Air Force Base) was constructed. The installation greatly expanded during World War II and continued to expand through the Vietnam and Cold Wars. At the conclusion of the Cold War, when many military installations were downsizing, Fort Lewis continued to grow due to its strategic location in the Pacific Northwest region.

### McChord Air Force Base

McChord Field was established as an airfield supporting Fort Lewis in 1930, originally named Tacoma Field. In 1940, after the airfield was officially transferred to the U.S. Government, it was renamed McChord Field in honor of Colonel William Caldwell McChord, Chief of the Training and Operations Division in HQ Army Air Corps, who died in 1937. After the bombing of Pearl Harbor in December 1941, nearly all new heavy bomb groups were organized and trained at McChord Field. In 1946, McChord was assigned to the new Air Defense Command. The new installation mission was air defense of the United States, and McChord was the first of 28 stations forming part of the permanent air defense radar network.

Today, the Western Air Defense Sector (WADS) is a major tenant at McChord Field. It is one of two air defense sectors responsible for the security and integrity of U.S. air space. In

1947, with the inception of the United States Air Force, McChord Field became independent of Fort Lewis, and was re-designated McChord Air Force Base. Since then, the primary mission at McChord has been airlift, and today the 62nd Airlift Wing is the primary Air Force active duty unit at the installation. Together with the Reserve 446<sup>th</sup> Air Wing, McChord Field can provide strategic airlift capabilities 24 hours a day, 7 days a week, 365 day a year.



## **5. Federal, State, and Regional Policy Context**

### **5.1. Department of Defense Joint Land Use Study Program**

The JLUS program, managed by the Office of Economic Adjustment (OEA), operates under congressional authorization given to DoD in 1985 for the purpose of incorporating noise and aircraft safety data into local planning programs. A JLUS is a cooperative land use planning effort between military installations and local communities intended to support the implementation of compatible development measures that prevent urban encroachment, safeguard the military mission, and protect the public health, safety, and welfare.

### **5.2. Washington State Growth Management Act**

The Washington State Growth Management Act (GMA) directs cities and counties in the state to plan for future growth. Communities required to plan under GMA must adopt a comprehensive plan and supporting development regulations, which include zoning, subdivision, and environmentally critical areas ordinances, among others. Cities and counties must coordinate to establish UGAs that can accommodate 20 years of housing and employment growth based on population projections. Urban growth must be directed within UGAs. Development at urban densities, including urban services such as urban sanitary sewer service, is prohibited outside of UGAs.

The GMA also requires comprehensive plans to be periodically updated. Pierce County and the City of Tacoma are required to adopt updated Comprehensive Plans in 2015, while the remaining communities within the study area are required to adopt updates in 2016.

### **5.3. South Sound Military and Communities Partnership**

In 2010, The City of Lakewood led the JBLM Growth Coordination Plan, an OEA-funded study intended to address the rapid growth on JBLM that was occurring at the same time that many of its neighboring communities were also growing. The South Sound Military and Communities Partnership (SSMCP) was formed as a result of a Growth Coordination Plan recommendation to “establish a regional partnership to coordinate community and military planning services.” The mission of the SSMCP is to foster effective communication, understanding, and mutual support with one point of coordination for the resolution of issues that transcend the specific interests of the military and civilian communities of the JBLM region. The SSMCP is comprised of a coalition of south Puget Sound area city and county governments, military installations, social service organizations, and private associations, and regional planning councils. Washington State agencies, local businesses, and nonprofit organizations support and advise the SSMCP. The SSMCP has been an effective organization in securing funding for projects such as this JLUS, transportation-related studies, and other projects related to the interface of military issues and community planning. The SSMCP will continue to play a vital role in facilitating the implementation of JLUS recommendations.

## 6. Overview of Community Plans and Regulatory Policy

JBLM is bordered by a number of cities as well as unincorporated urban and rural lands in both Pierce and Thurston counties. As the communities around the base grow, development patterns can emerge that result in more people living and working in very close proximity to the base. This can create a land use conflict known as encroachment, in which civilian uses put pressure on military installations to modify their operations, possibly threatening the ability of the DoD to conduct training necessary for achieving and maintaining combat readiness. Higher intensity uses of land near installation boundaries, such as major employment and service centers, public assembly facilities, and high density housing, can pose the potential for conflict. Uses that emit airborne substances or electrical currents, or that attract birds, can also cause conflicts in areas located within the Clear Zones and APZs of military airfields. Training and readiness activities at JBLM produce various impacts that can diminish the quality of life in surrounding communities, including noise and the risk of aircraft accidents. Zoning in the study area is depicted on Figure 6.1.

Local government tools such as growth management policies and land use regulations can help ensure land use compatibility with military installations by mitigating known impacts and preventing future encroachment. For this analysis, the existing major land use policy documents and the land use regulations of the cities, counties, and regional governments in the JBLM JLUS study area were reviewed. A complete list of those plans and regulatory codes is provided in Table 6.1. In general, the policy plans were more likely than the codes to contain policies and regulations focusing on land use compatibility with JBLM.



**Table 6.1. Plans and Codes Reviewed**

<b>Geographic Area Covered</b>	<b>Title</b>	<b>Date</b>
City of DuPont	City of DuPont Comprehensive Land Use Plan	2001
City of DuPont	DuPont Municipal Code	2014
City of Lacey	City of Lacey and Thurston County Land Use Plan for the Lacey Urban Growth Area	2008
City of Lacey	Lacey Municipal Code	2014
City of Lakewood	City of Lakewood Comprehensive Plan	2000
City of Lakewood	City of Lakewood Municipal Code	2014
Nisqually Indian Reservation and Off-Reservation Service Areas	Nisqually Indian Tribe Community Vision Plan	2013
Pierce County	Pierce County Comprehensive Plan	2011
Pierce County	Pierce County Code	2013
Pierce County	Pierce County Countywide Planning Policies	2012
King, Kitsap, Pierce and Snohomish Counties	Vision 2040 (Puget Sound Regional Council)	2009
City of Rainier	Comprehensive Plan for Growth Management and Joint Comprehensive Plan with Thurston County for Growth Management in the Rainier Urban Growth Area	2007
City of Rainier	Rainier Municipal Code	2012
City of Roy	City of Roy Comprehensive Plan	2004
City of Roy	Roy City Code	2014
Town of Steilacoom	Town of Steilacoom Comprehensive Plan	2012
Town of Steilacoom	Steilacoom Municipal Code	2013
City of Tacoma	City of Tacoma Comprehensive Plan	2014
City of Tacoma	Tacoma Municipal Code	2014
Thurston County	Thurston County Comprehensive Plan	2008
Thurston County	Thurston County Code	2014
Thurston County	Thurston County Countywide Planning Policies	2002
Thurston County	Thurston 2025 Regional Transportation Plan	2004
City of Yelm	City of Yelm Comprehensive Plan and Joint Plan with Thurston County	2009
City of Yelm	Yelm Municipal Code	2014
City of Yelm's Master Plan Zoning District	Thurston Highlands Final Environmental Impact Statement	2008

Findings of the review are summarized in Table 6.2 and described in greater detail below. Most of the cities, counties, and regional governments in the study area have land use policies or regulations in place that promote a harmonious relationship with JBLM. These generally fall into three categories:

1. Promoting compatibility by regulating land use intensities or by encouraging collaborative planning with JBLM.
2. Mitigating negative off-base impacts through techniques such as noise attenuation.

3. Recognizing the unique nature of military installations located within local municipal boundaries.

Some of the policies and regulations reference Fort Lewis or McChord Air Force Base because they pre-date the formation of JBLM. For the purposes of this analysis, these were considered to apply to JBLM.

All of the cities and counties in the study area are in the process of updating their comprehensive plans, as required by the GMA. The state deadline for Pierce County jurisdictions to complete their periodic comprehensive plan updates is 2015. The deadline for Thurston County jurisdictions is 2016. There may be new policies and regulations adopted by local governments in the near future that address JBLM. The JLUS offers an opportunity to develop guidance in conjunction with these planning efforts.

**Table 6.2. Summary of Findings**

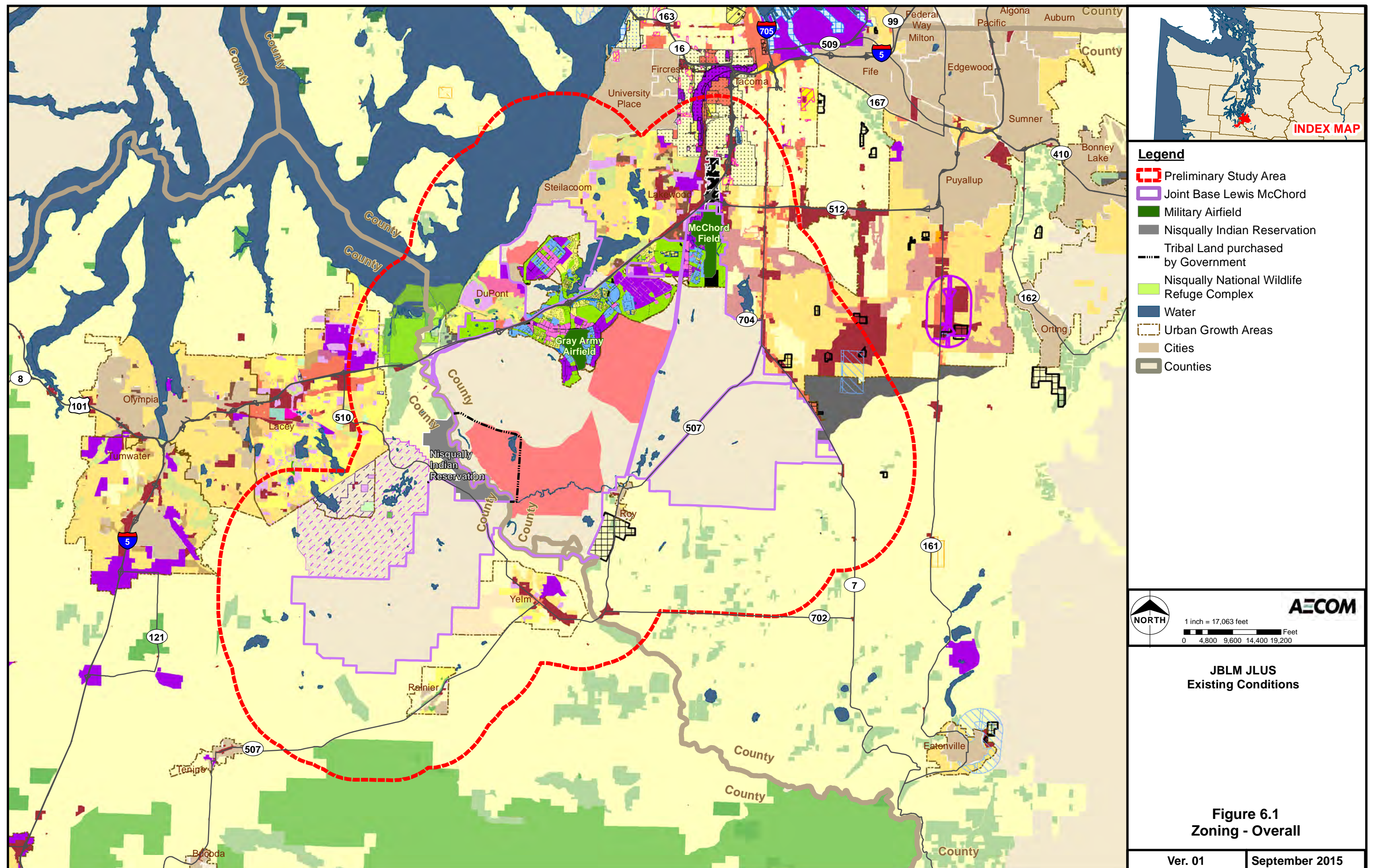
Government or Regional Planning Council	Borders Base	Within Clear Zone, APZ I, or APZ II	Types of Policies or Regulations			Other Mention of JBLM
			Compatible Land Use Patterns	Mitigation of Off-Base Impacts	Military Installations within Municipality	
DuPont	X				X	X
Lacey						X
Lakewood	X	X	X	X	X	X
Nisqually Indian Tribe	X				X	X
Pierce County	X	X	X	X	X	X
Puget Sound Regional Council	NA	NA	X			X
Rainier						X
Roy	X			X		X
Steilacoom	X			X		X
Tacoma		X	X	X		X
Thurston County	X		X	X		X
Thurston Regional Planning Council	NA	NA	X	X		X
Yelm	X		X			X

Key findings of the analysis include:

- Lakewood has established zoning designations for Military Lands (ML), Clear Zone (CZ), Air Corridor 1 (AC1), and Air Corridor 2 (AC2), but grandfathered uses exist and permitted uses may allow for additional incompatible development.
- Pierce County created an Airport Overlay (AIR) designation intended to minimize land use incompatibilities in CZ and APZs and requires noise insulation and disclosure of noise within areas where noise impacts are considered significant.

- Tacoma encourages the use of noise reduction techniques to mitigate impacts of aircraft noise and encourages lower density development in APZs.
- Thurston County requires disclosure of noise impacts (from military operations and other sources like airfields) on deeds.
- Yelm has zoned 1,200 acres for future residential development as part of a potential Thurston Highlands master planned community, which borders heavily used JBLM training areas.
- Other jurisdictions reference JBLM but have few specific land use regulations that address impacts to the joint base.







### 6.1.Pierce County

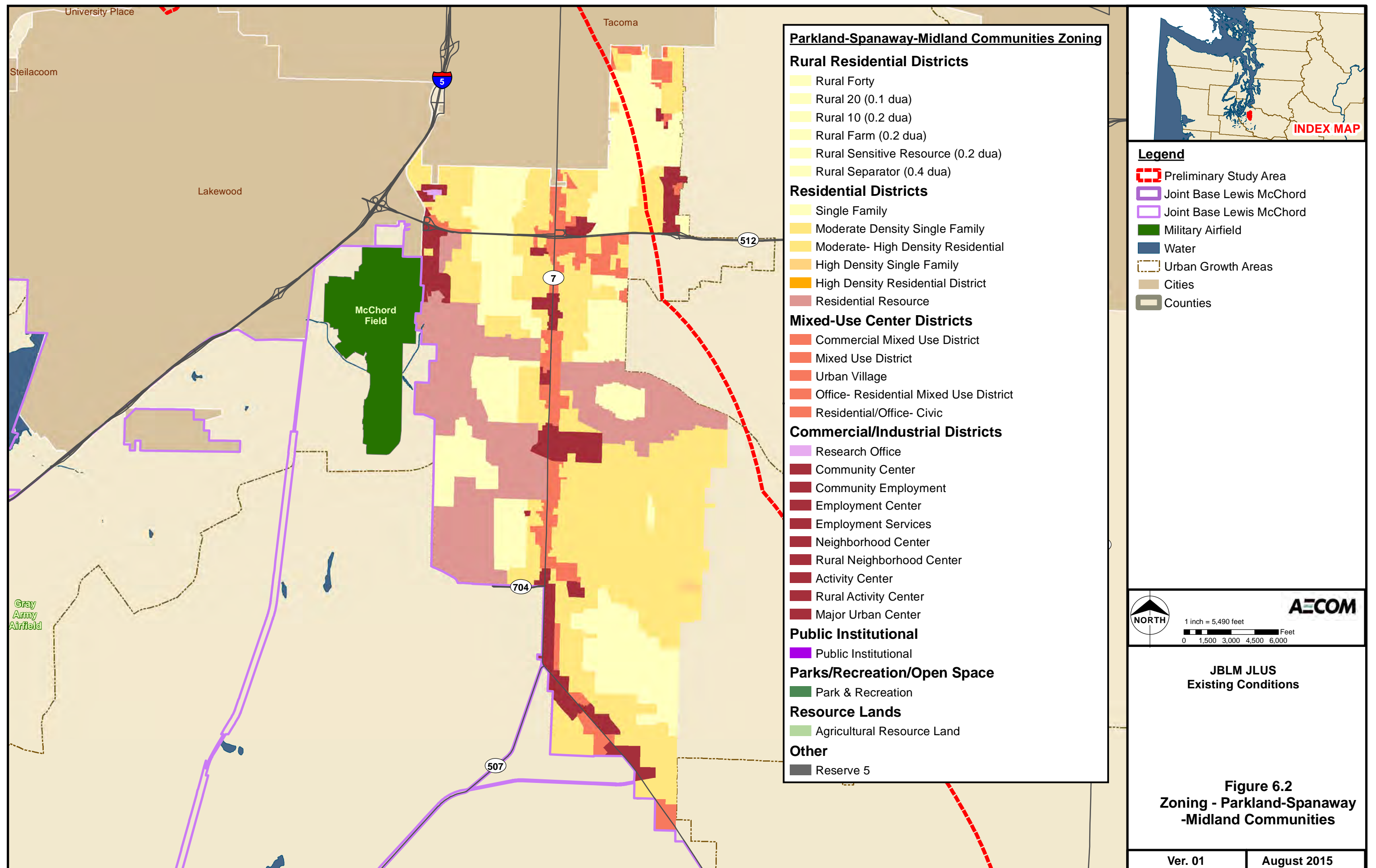
A large portion of JBLM is bordered by unincorporated Pierce County. Unincorporated urban county lands adjacent to JBLM are primarily located along the northeastern edge of the base. Figure 6.2 depicts zoning in this area. Uses in this area are primarily residential, and also include mixed uses, community employment uses, and a rural reserve area (an area currently zoned for rural land uses, but identified for potential future urban growth). The County's zoning map shows that a small portion of unincorporated urban county lands (less than 15 acres) are within the McChord APZ 1; the majority of this area is zoned for residential uses. Unincorporated rural county lands adjacent to JBLM are primarily located along the southeastern edge of the base.

The County's comprehensive plan (2011) includes significant discussion and policy language regarding JBLM. One reason for this is that in 1992 the Pierce County Council passed Resolution No. R92-103, adopting the initial JLUS study for Fort Lewis and McChord Air Force Base, conducted by the County and published in 1992. R92-103 also directed the County to integrate JLUS recommendations into the updates of land use regulations. The comprehensive plan includes eight objectives that specifically address land use compatibility issues. LU-JLUS Objectives 74, 75, and 76 address the Clear Zone, APZ I, and APZ II and include provisions for regulating incompatible land uses and mitigating impacts. LU-JLUS Objective 76 is specifically focused on noise impacts. ENV Objective 11 also addresses noise impacts; it calls for the County to address development activities and land use designations in areas adjacent to airports and military installations to ensure that noise impacts on residents are minimized. LU-JLUS Objective 77 recognizes safety issues associated with training, artillery, and small arms activities on the base, and includes provisions for regulating incompatible land uses and mitigating impacts. LU-JLUS Objective 79 calls for providing military installations with opportunities to participate in the review and development of land use programs, policies, and decisions that affect them. LU-UML Objectives 80 and 81 address military installations on County lands. They recognize the unique character of land uses associated with military operations, and clarify how military lands will be treated in the analysis of residential land capacity within the Pierce County Comprehensive Urban Growth Area.

There are additional objectives regarding JBLM in the comprehensive plan. These include objectives for cooperating with the base in developing plans for transportation circulation improvements around installations (LU-JLUS Objective 78), recognizing the possibility of military lands reverting back to Pierce County (LU-UML Objective 82), providing guidance for designating other military lands (LU-UML Objective 83), and recognizing the portions of federal military installations that lie outside of the UGA (LU-RML Objective 84).

The Pierce County Code includes regulatory language about military lands and the McChord air corridor, which are those areas within the NCZ and APZs. Section 18A.10.110 establishes the Urban Military Lands (UML) and Rural Military Lands (RLM) zoning classifications and recognizes that the autonomy associated with the federal ownership in combination with the unique character of the military operations and support structures is not typical of civilian land uses. Section 18A.10.100 establishes airport overlays, which are intended to minimize land use incompatibilities associated with operations at McChord Air Force Base and Pierce County's Thun Field. Section 18A.60.020 prohibits large concentrations of people in the McChord APZ I, as well as new residential uses. Section 18A.60.040 includes provisions for noise insulations that apply to uses within the 65 Ldn (65 decibel, day-night average sound level) Noise Contour, the Clear Zone, the APZ I, and APZ II for McChord Air Force Base. Section 18A.60.050 provides performance criteria for use in determining the compatibility of a use, the project design, and any mitigation measures with aircraft operations within Clear Zones or within the APZs.

In addition to the County's comprehensive plan and regulatory code, there are the Pierce County Countywide Planning Policies. The Washington State GMA requires counties and the municipalities inside of their boundaries to develop countywide planning policies. These policies establish a countywide framework for comprehensive plans, and are intended to ensure that county and municipal plans are consistent. The Pierce County Countywide Planning Policies include a policy that encourages compatible land use patterns around JBLM. Policy UGA-9 states that the County and each municipality neighboring JBLM should develop planning provisions, including development regulations that encourage adjacent land uses that are compatible with military uses.



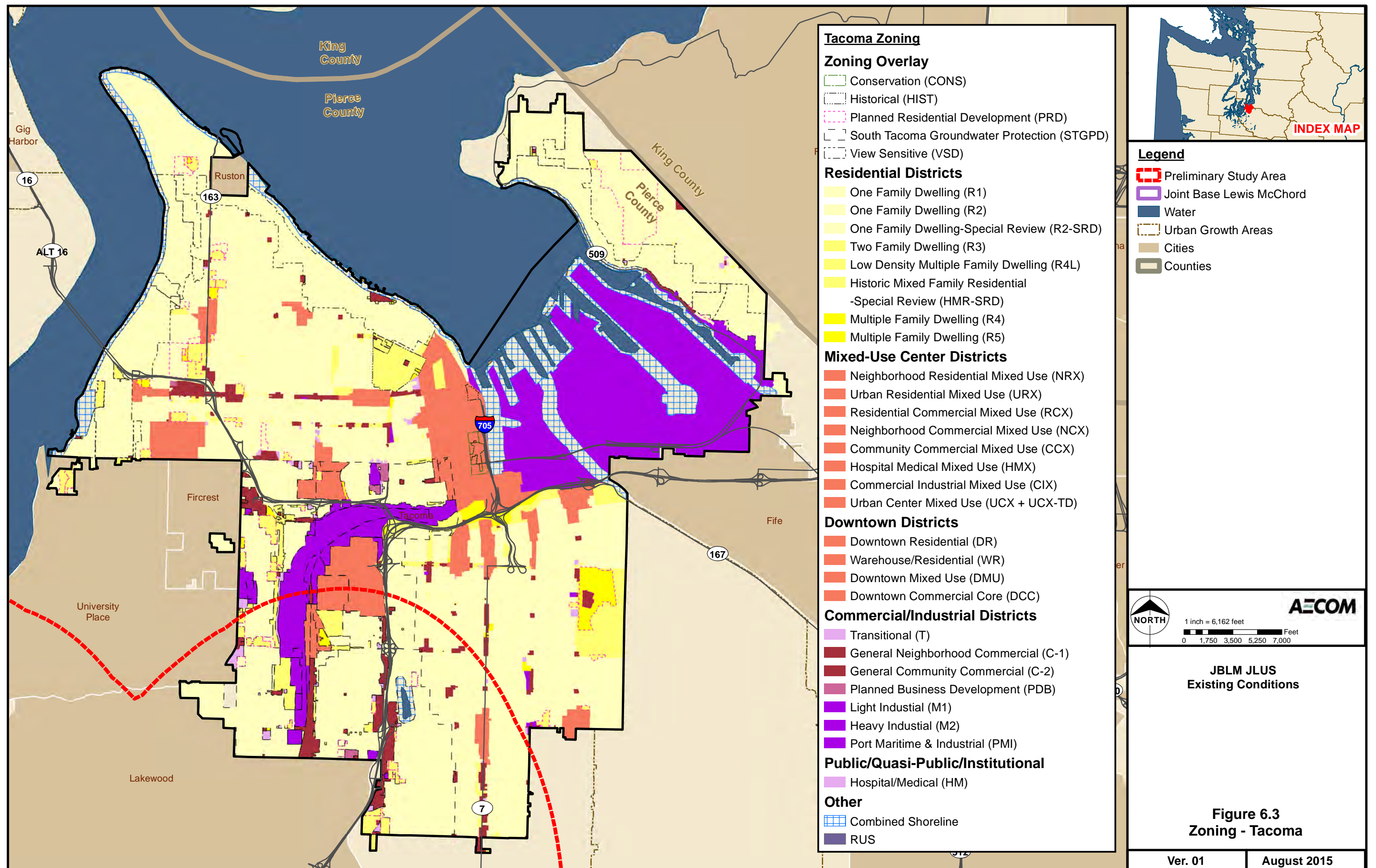
## 6.2. City of Tacoma

The City of Tacoma does not abut JBLM; however, a small portion of the southern part of Tacoma is within the McChord Field APZ II area. Tacoma zoning is shown on Figure 6.3. This area is zoned for residential, commercial, and business uses; it contains an elementary school and two parks.

The City's comprehensive plan (2014) includes goals and policies that address impacts associated with the APZ II area. Goal ST-8 promotes the use of noise reduction techniques to protect citizens against the adverse effects of noise, including noise generated by McChord Field operations. Specific policy provisions include buffering noise sources, using construction techniques that reduce noise, discouraging uses that will significantly increase noise levels in areas that are already noise-impacted, and discouraging noise-sensitive uses in noise-impacted areas. Goal ST-9 promotes lowering residential densities and identifying flight hazards in the APZ II zone to limit injury and property damage in the event of an Air Force aircraft accident. Supporting policies include establishing procedures to notify the commander of McChord Field concerning proposed land use changes; discouraging concentrations of more than 25 people and housing densities greater than 6 units per acre; restricting flight hazards such as airborne substances, light, electrical currents, and bird-attracting uses; and minimizing incompatible uses such as public assembly facilities.

The City's comprehensive plan also includes a general policy about planning for compatible land use development. Policy LU-UGA-8 calls for the City to coordinate planning with Pierce County and other adjacent jurisdictions for land use development, transportation, and services within UGAs to ensure that development is orderly, compatible, sufficiently served, and consistent with City plans.





### 6.3. City of Lakewood

The City of Lakewood's southwestern border is adjacent to JBLM. Most of the City's southeastern border is just across I-5 from JBLM. There is also a small area of land across from I-5 that is within the City's jurisdiction, known as the Woodbrook Area. The easternmost tip of Lakewood is within the McChord Field NCZ, APZ I, and APZ II (also referred to as the "air corridor"). The City's zoning and land use maps show that the parcels adjacent to the base are designated for a variety of uses, including open space, single-family residential, multi-family residential, mixed use, commercial, institutional, and industrial. There are also designations for military lands within the City's jurisdiction, and for the NCZ, APZ I, and APZ II. Lakewood zoning is shown on Figure 6.4.

The City's comprehensive plan (2000) and municipal code have policies and regulations in place to address military lands and the air corridor. Military lands are defined in the comprehensive plan as the portions of the federal and state military installations within the City. Goal LU-35 and its corresponding policies recognize that military lands require unique consideration and coordination by the City. Policy LU-35.2 adopts by reference the official federal and state military installation master plans addressing military lands within the City. Goal LU-36 and its corresponding policies support a strong community relationship with military installations. Policy LU-36.2 states that the City will promote an active planning and funded mitigation effort to improve the isolated communities adjacent to military installations.

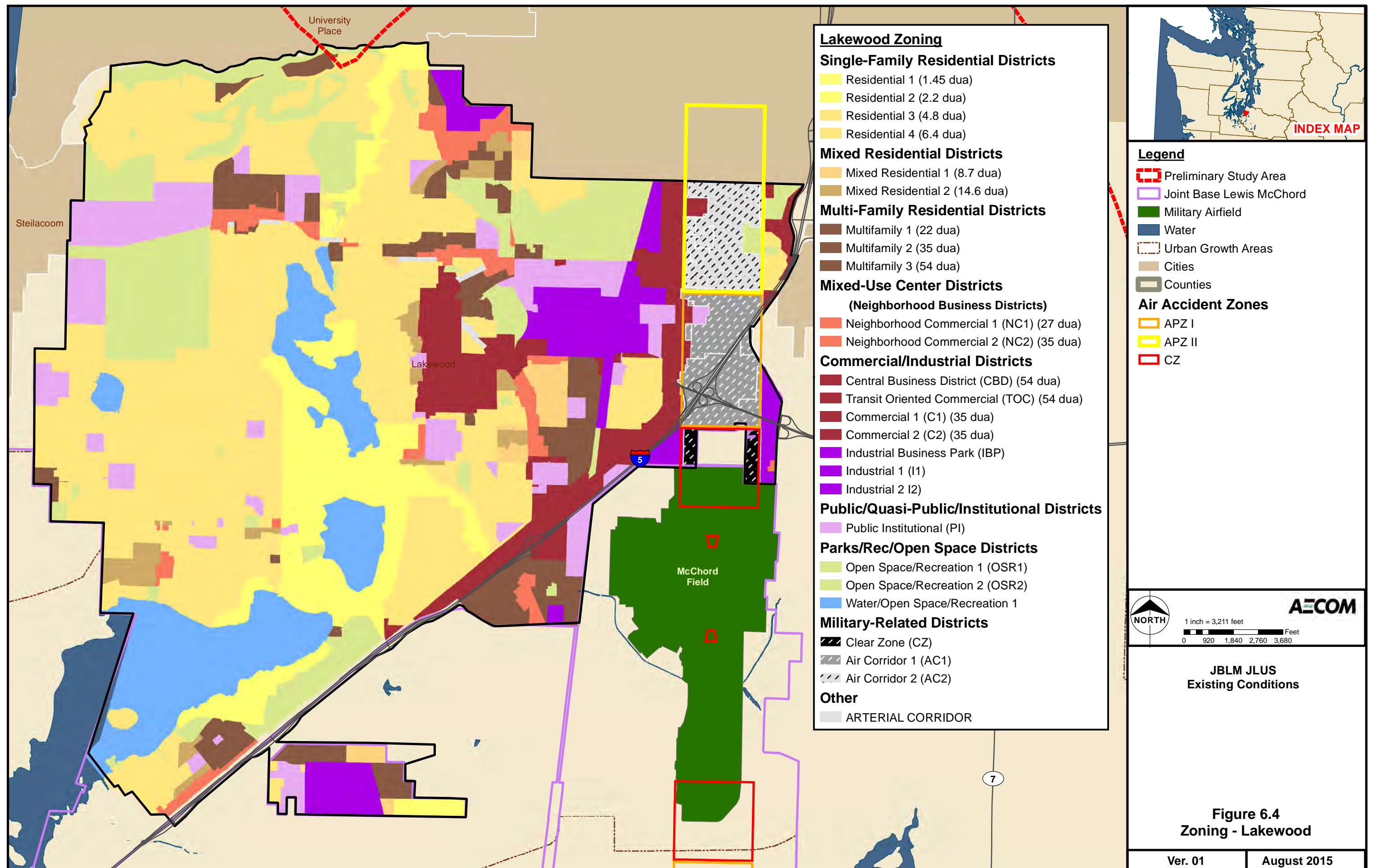
Goals LU-37 through LU-39 address the air corridor areas that extend northward from the McChord Field runway and that are subject to noise and safety impacts of military flight operations. Goal LU-37 is to minimize the risk to life and property from potential hazards associated with military flight operations. Policies in support of this goal include coordinating with JBLM on mitigation measures; controlling the type, intensity, and design of uses within the corridor; identifying areas of restricted development; and promoting the acquisition of the parcels in the NCZ by JBLM. Goal LU-38 is to identify appropriate land uses within the air corridor. Supporting policies include promoting the conversion of existing higher-density housing to less intense land uses and encouraging the siting of appropriate land uses within the air corridor such as warehousing and open space. Goal LU-39 and its corresponding policies have to do with minimizing the negative impacts of aircraft noise through actions such as working with the base to identify noise impact contours and developing design and construction guidelines.

Sections 18A.30.700 through 18A.30.790 of the City's municipal code describe the City's military-related zoning districts: Military Lands (ML), Clear Zone (CZ), Air Corridor 1 (AC1), and Air Corridor 2 (AC2). The purpose of the ML zoning district is to recognize the autonomy associated with federal and state ownership of the military installations adjacent to and within Lakewood, which are not typical of civilian land uses and require special

consideration by the City as a host community. The purpose of the CZ, AC1, and AC2 zoning districts is to promote land use and development that is compatible with the aircraft noise and accident potential associated with the proximity to JBLM aircraft flight operations. Section 18A.30.790 addresses noise attenuation and establishes requirements for building design and construction in the CZ, AC1, and AC2 zoning districts, such as sound insulation. Section 18A.30.770 includes provisions to limit the intensity of development patterns; the intensity limit for the CZ zoning district is 10 people per acre, the limit for AC1 is 25 people per acre, and the limit for AC2 is 50 people per acre. Section 18A.30.780 establishes land use regulations to help prevent poor visibility and obstructions that could lead to aircraft crashes, such as the generation of steam, dust, or smoke, and attracting flocks of birds.

Section 18.A.30.730 describes permitted uses in military-related zoning districts. In the CZ, AC1, and AC2 zoning districts, continuation of uses that legally existed at the time the ordinance was adopted is permitted. Thus, while new development must comply with the standards mentioned above to ensure compatibility with military aircraft operations, there may be some existing, permitted uses that are less compatible.





#### 6.4. City of DuPont

JBLM borders the City of DuPont on the northeast, east, and southeast. Along the northeastern border, DuPont has lands designated for military use, open space, and a residential reserve area that has been identified for potential future residential growth. To the east, lands are designated for a variety of uses, including military, open space, residential, commercial, industrial, and manufacturing and research. The City's Town Center is in the southeast, along the I-5 corridor. This area includes mixed uses, office, commercial, residential, and open space. The remainder of the southeastern border with JBLM includes residential uses and some open space. DuPont zoning is shown on Figure 6.5.

The City's comprehensive land use plan (2001) does not specifically discuss land use compatibility with JBLM; however, Policy LU-35 states that two industrial areas will be established to the west and south of the lands designated for military uses within the City. The policy discussion points out that industrial uses tend to have lower employee densities than other uses. Lower intensity land uses are generally compatible with military installations. The comprehensive plan also mentions JBLM's impacts on traffic patterns and the environment. For instance, Policy ESA-12 calls for working with Fort Lewis, the Washington State Department of Ecology (Ecology), and other affected parties to re-establish historic flows through Sequelitchew Creek.

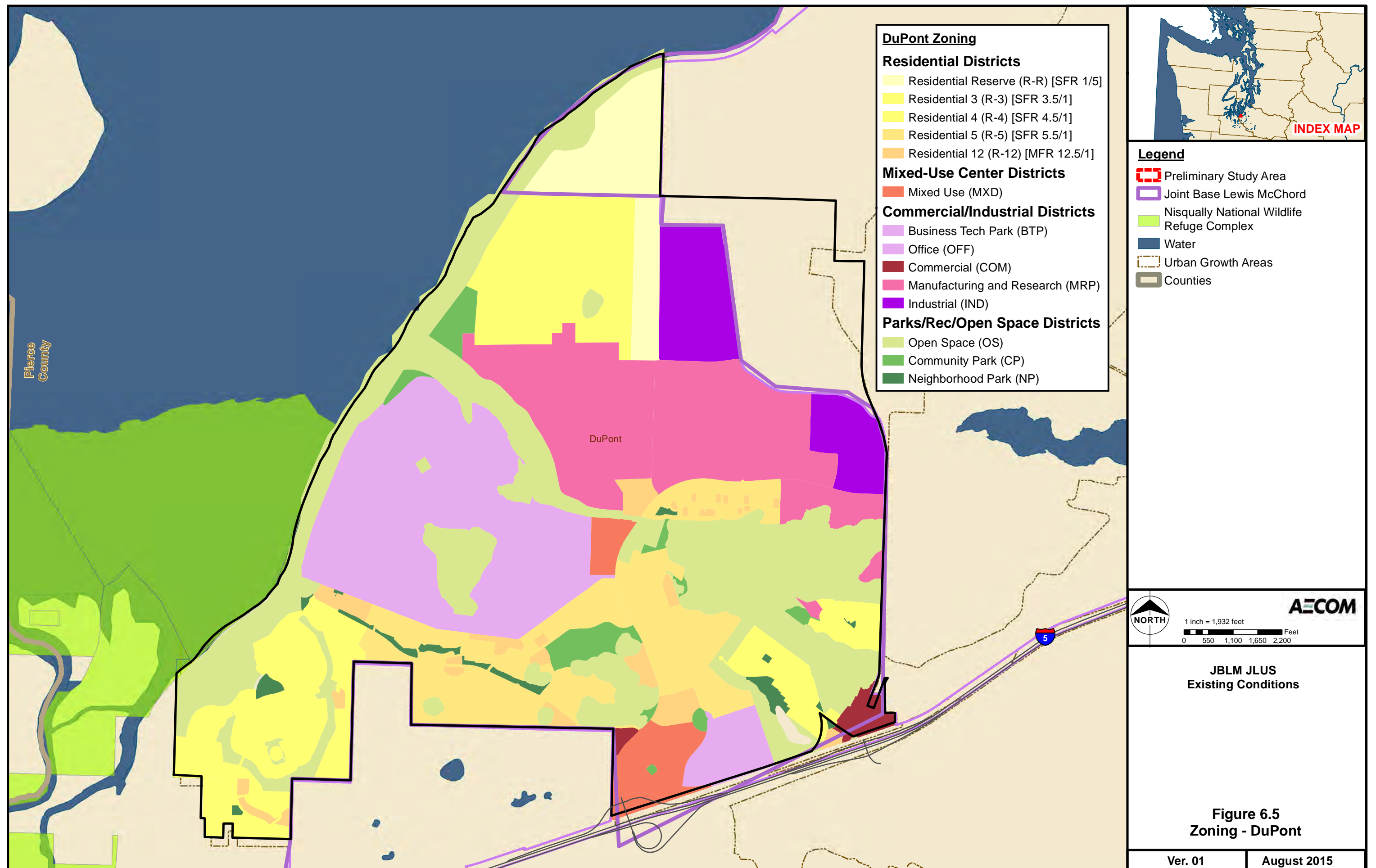
The City's municipal code describes the lands within DuPont that are designated for military uses. Section 25.57.010 recognizes that there are federal military installations within the DuPont city limits, that these lands have unique character and uses associated with military operations, and that these lands are managed by the federal government rather than the City.

#### 6.5. Town of Steilacoom

A portion of the Town of Steilacoom's southern border is adjacent to JBLM. The Town's current zoning and land use maps show that the parcels adjacent to the base are designated for open space and single-family residential uses.

There are mentions throughout the Town's comprehensive plan (2012) of JBLM's impacts on the demographics, economy, services, and traffic of Steilacoom. There is also some discussion of land use compatibility. The plan mentions that military aircraft from the base frequently fly over Steilacoom, and that flight patterns are restricted to minimize noise impacts in residential areas. Also, Policy 7.3 states that the Town supports interlocal planning agreements that help to mitigate impacts associated with development outside of the Town boundaries.





### 6.6. City of Roy

A portion of the City of Roy's western border is adjacent to JBLM. The City's zoning map shows that the parcels adjacent to the base are zoned for single-family, multi-family, and light industrial uses. Applied zoning designations are consistent with the future land use designations found in the comprehensive plan.

Policy 7-3 in the City's comprehensive plan (2004) aims to prevent conflicts between base missions and the community. It states that the City will work with JBLM officials to mitigate noise impacts caused by military activities. The comprehensive plan also notes that Roy has limited options for expansion, because it is bordered on all sides by JBLM; a proposed Roy Mitigation Site (for western gray squirrel habitat), a proposed Nisqually River Interpretive Center; and various critical areas.

### 6.7. Thurston County

The majority of JBLM land in Thurston County is adjacent to unincorporated Thurston County land, with the exception of Yelm and the Nisqually Indian Reservation. The County's zoning map shows that the parcels adjacent to the east, south, and west of the base are zoned for resource use, agriculture, or low density single family. Most of the parcels adjacent to the north of the base are part of the McAllister Geologically Sensitive Area, which allows low density residential, commercial, and agricultural uses that minimize the potential for contamination or significant loss in recharge capacity of a vulnerable groundwater aquifer and potable water source of importance to the general public. According to the County's comprehensive plan, zoning designations and future land use designations are consistent with each other.

Thurston County's comprehensive plan (2008) encourages cooperation with JBLM, as well as other governmental jurisdictions, in Land Use Goal 3, Objective D, Policy 1. Additionally, Land Use Goal 3, Objective D, Policy 2 states that the JBLM base commander is to be adequately notified of any changes to a comprehensive plan or development regulation amendment so that the current land use and long-range goals of the base are considered in any final action.

Noise impacts are mentioned several times in the County's comprehensive plan. Land Use Goal 1, Objective A, Policy 18 aims for the siting of uses adjacent to the base to take into account any noise impacts. Policy 4 of the Air Quality Goal in the Natural Environment section call for the County to minimize noise impacts from noise-producing sources, such as military firing ranges, by designating noise impacted lands for use as forestry, agriculture, public reserves, industrial, and, as a last priority, low-density residential (the deed, title, or covenant for lots in new residential subdivisions must contain statements notifying prospective purchasers that the property will be affected by noise). Noise impact areas identified in the plan primarily include agricultural lands, the McAllister Geologically Sensitive Area, and low-density residential.



The Thurston County Code establishes the Military Reservation (MR) zoning district, which includes the portion of JBLM that is in Thurston County. Section 20.08F recognizes that the primary purpose of the base is the military mission of training and national defense. It also states that a secondary purpose is natural resource production, and that Thurston County does not have regulatory authority over federally owned lands.

The Thurston County Countywide Planning Policies do not contain any policies specific to JBLM or military installations.

### **6.8.City of Yelm**

Yelm's southwest border is adjacent to JBLM. Yelm area zoning, including the Nisqually Indian Reservation, is shown on Figure 6.6. The southwest portion of the City is currently undeveloped, but it is zoned for a master planned community. A Final Environmental Impact Statement (FEIS) was published in 2008 for this area, for a development called Thurston Highlands. The FEIS studied potential impacts such as noise and light from military operations on residents. It found that these could be mitigated and that no significant unavoidable adverse impacts were identified that would affect compatibility between the proposed master planned community and JBLM. The development has not moved forward since publication of the FEIS, due to economic challenges posed by the recession.

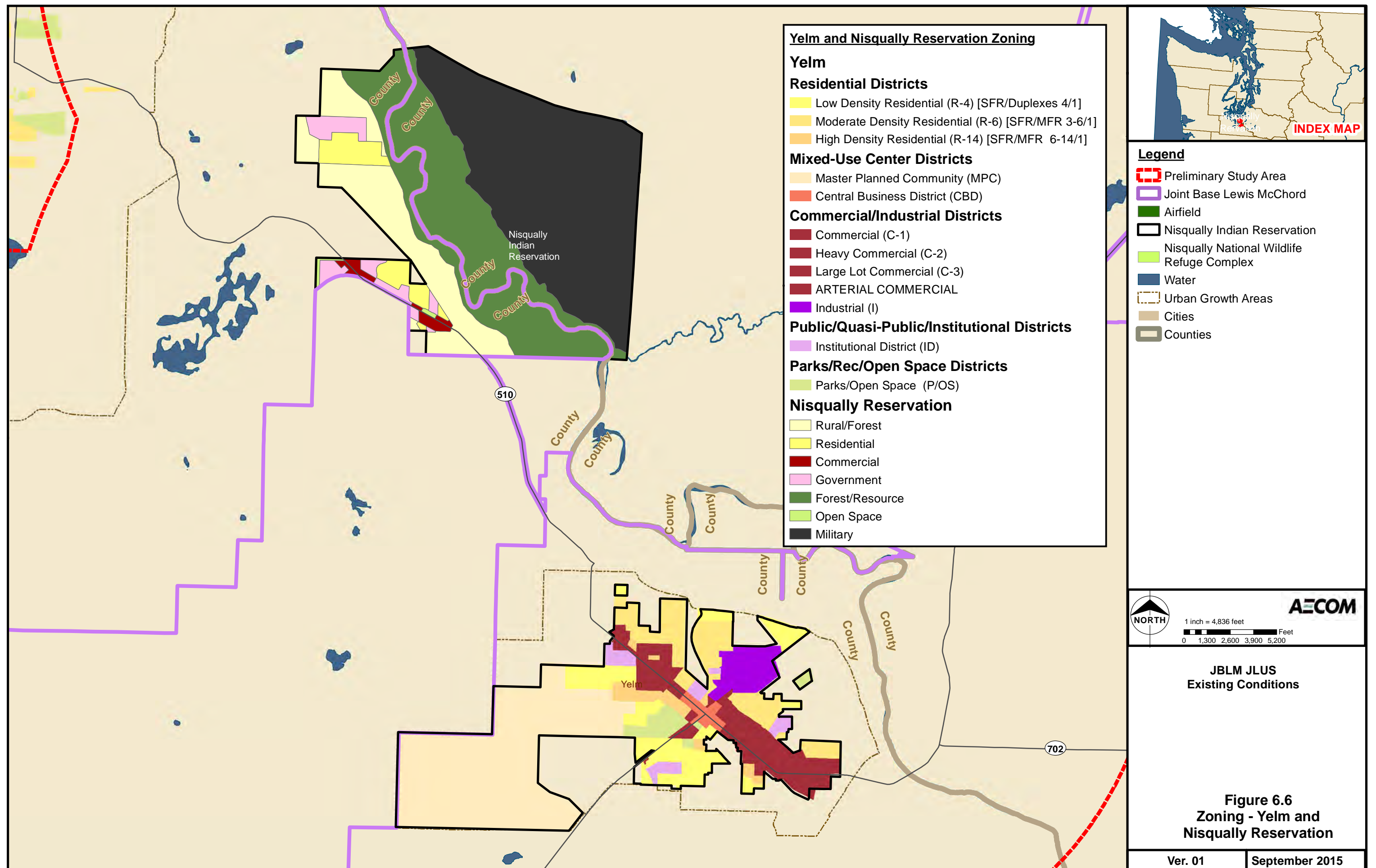
The City's comprehensive plan (2009) contains language that the City will cooperate with governmental jurisdictions, including the Joint Base Commander and neighboring jurisdictions, on land use planning efforts, and will provide notification and opportunity to comment prior to final action on a comprehensive plan or development regulation amendment. The plan also contains policy language for cooperating with neighboring jurisdictions to address regional transportation issues and improved access to JBLM.

### **6.9.City of Rainier**

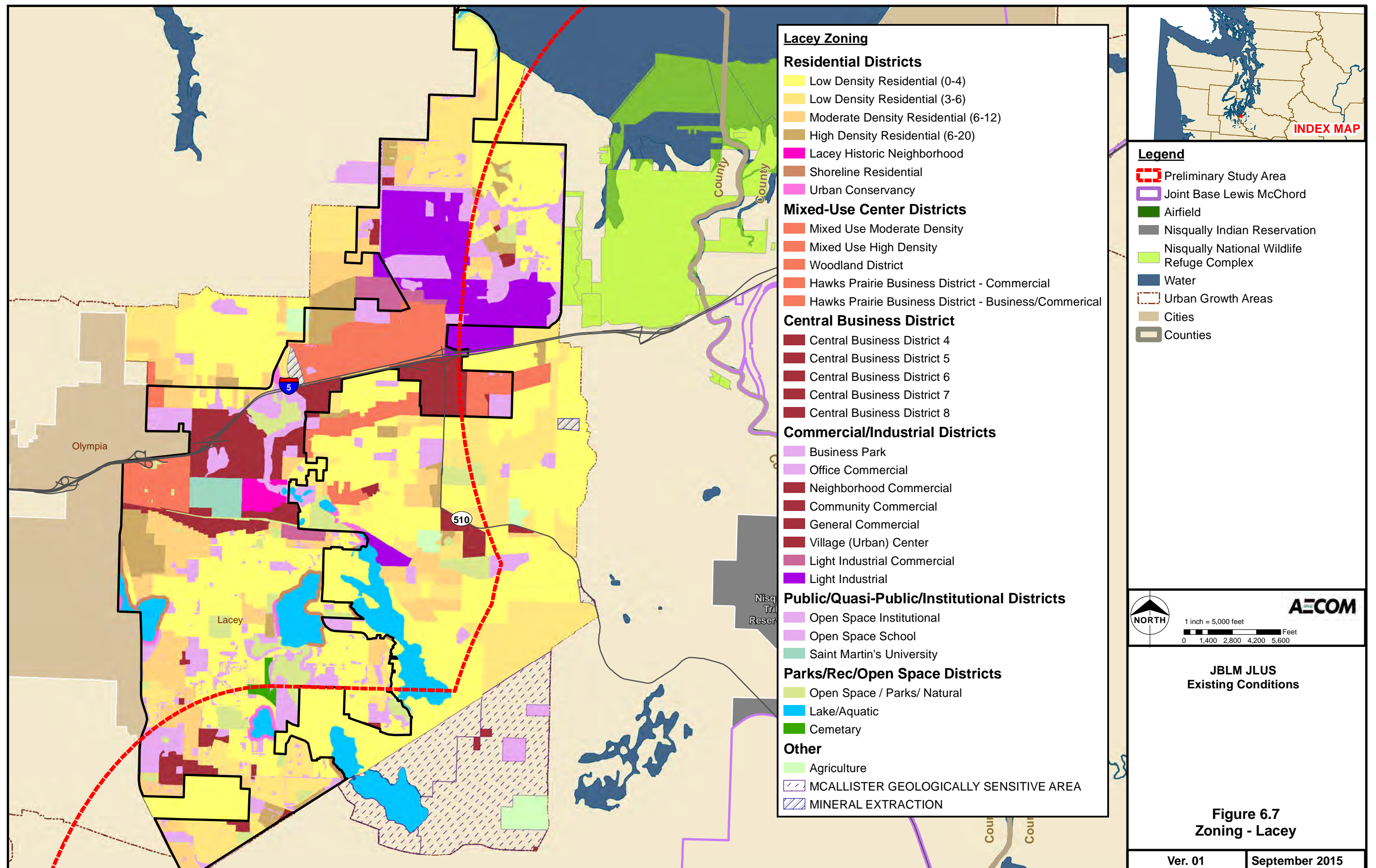
The City of Rainier and the Rainier UGA do not directly border JBLM, although the western and northern boundaries are separated from the base only by a small area of unincorporated Thurston County. The City's current zoning and land use maps show that the parcels near the base are designated for low- and medium-density residential uses. The City's comprehensive plan (2007) does not contain any policies directly related to JBLM.

### **6.10. City of Lacey**

The City of Lacey does not directly border the base but is within the JLUS study area. Lacey zoning is shown on Figure 6.7. The City's comprehensive plan (2008) does not contain any policies or regulations directly related to JBLM. However, the City profile and history reference proximity to the base, and the resulting number of active duty military personnel living in Lacey, as a significant historic and present-day growth pressure.







### **6.11. Nisqually Indian Tribe**

The Nisqually Indian Reservation is located along the Nisqually River at the junction of Pierce and Thurston counties. It is bordered to the north, east, and south by JBLM. The reservation lands to the south and west of the river are controlled by the Tribe and include residences and the Tribal Center. The reservation lands north and east of the river are controlled by JBLM and serve as an artillery impact area.

The Nisqually Indian Tribe Community Vision Plan includes a few mentions of JBLM, but does not include any policy language specific to the base. It does include policies about building partnerships to protect natural resources such as habitat areas, shorelines, and forested lands.

### **6.12. Puget Sound Regional Council**

The Puget Sound Regional Council (PSRC) is the planning agency for a four-county region including King, Kitsap, Pierce, and Snohomish counties. PSRC works with local governments, businesses, and citizens to build a common vision for the region's future, expressed through three connected major activities: VISION 2040, the region's growth strategy; Transportation 2040, the region's long-range transportation plan; and Prosperity Partnership, which develops and advances the region's economic strategy.

VISION 2040 addresses land use compatibility issues related to military installations. Multi-county Planning Policy (MPP) DP-52 states that counties and jurisdictions in the region will protect military lands from encroachment by incompatible uses and development on adjacent land. The plan also includes a discussion of the fact that encroachment of incompatible land uses around airports is a significant problem, and that Washington State law calls for the protection of both general aviation airports and military airfields from incompatible land uses.

In 2014, PSRC began to evaluate whether the VISION 2040 and Transportation 2040 frameworks should recognize military facilities as regional employment centers. The initial draft report, published in September 2014, provides background on military facilities in the region; describes how these facilities are currently included in each of the economic, land use, and transportation planning programs at PSRC; and offers recommendations to the Growth Management Policy Board.

The report recognizes that military facilities play a major role in the central Puget Sound region's economy. The Regional Economic Strategy lists military facilities as an industry cluster due to these economic impacts. The military cluster, which includes direct employees and related industries, provides more than \$3.1 billion annually in total payroll to 91,000 people in the four-county area. Secondary impacts are also significant, with local sales associated with military employment estimated at nearly \$24 billion. The estimated yearly impact of JBLM is \$6.18 billion (2010 data). The Regional Economic Strategy

establishes various implementation activities, some of which reflect the important economic interaction between the installations and surrounding communities. Goals include the retention of existing talent serving at military installations, continued support for the military mission, and the protection of military lands from encroachment and incompatible uses.

In addition to describing economic impacts, recent military sector reports identify other issues, challenges, and opportunities associated with a large military sector, including communication, information sharing, creating subarea plans, and addressing site-specific concerns through community outreach. Land use compatibility and the maintenance of public infrastructure that supports the military are among the specific issues highlighted.

VISION 2040 is the regional growth management, environmental, economic, and transportation plan for the central Puget Sound region. The primary military-related issue of concern of VISION 2040 is incompatible development. The plan, however, does not currently mention military facilities in the discussion of designated centers and only considers military facilities as part of existing infrastructure in Transportation 2040. Though there are no examples of military-sponsored projects in PSRC's Transportation Improvement Program, the Recognizing Military Facilities report notes that the military can partner with any eligible jurisdiction and submit an eligible project, including roads or transit projects that provide access to the military facilities.

In March 2015, the PSRC adopted the following Policy Position:

*In recognition of their importance in the central Puget Sound region, the Puget Sound Regional Council recognizes military facilities as regionally significant employment areas. This recognition means the following:*

**(2015-2016) PSRC Transportation Project Selection:** *The PSRC Project Selection Task Force should ensure that military communities have a voice at the Task Force. As part of this process, the Task Force is asked to consider whether the 2015 PSRC project selection criteria should be amended so that projects terminating at military facilities be scored as equivalent to locally defined centers in **countywide** funding competitions. Per federal statutes, military facilities will be able to partner with eligible applicants in countywide competitions but not be the sole applicant.*

**(2015-2016) PSRC Tiered Centers Framework Project:** *Based on the recommendations adopted in the 2013 Regional Centers Monitoring Report, PSRC will be implementing multicounty planning policies that call for the establishment of a common framework among the countywide processes for designating sub regional centers to ensure compatibility within the region. The role and inclusion of military facilities will be further considered as part of this regional conversation on a tiered centers framework.*

***(2016-2017) PSRC Data Collaboration:*** Multiple comments were made regarding the need for better data sharing and coordination. As part of the 2016-2017 Biennium Budget and Work Program, PSRC data staff will look for opportunities to gather data from, and share data with, military facilities.

***(2016-2017) PSRC/EDD Regional Economic Strategy Update:*** Military facilities and stakeholders are the most fully integrated into PSRC's economic development planning. The sector is recognized as an industry cluster, a military liaison has a seat on the Economic Development District Board, and a major activity in the current work program was completed through the establishment of a military sector organization. Staff will continue this high level of engagement in the 2017 update and through its participation in the Washington Military Alliance.

***(2016-2018) PSRC Long-Range Transportation Plan:*** The 2018 update of Transportation 2040 will include enhanced outreach and coordination with military facilities to create a fuller understanding of specific near-base transportation project needs. Military facilities will be recognized in the plan's text, maps, and project lists.

***Reflect Military Facilities in PSRC Plans:*** PSRC has begun, and will continue, to reflect military facilities in all of its plan maps and other appropriate plan elements.

### **6.13. Thurston Regional Planning Council**

The Thurston Regional Planning Council (TRPC) is a council of governments in Thurston County that carries out regionally focused plans and studies on topics such as transportation, growth management, and environmental quality. TRPC also provides information and education regarding the region and its emerging planning issues.

TRPC does not have a regional land use or growth management plan. TRPC does have a regional transportation plan, and is working to develop strategies for improving traffic flow along the section of I-5 that crosses JBLM, between Lacey and Lakewood.



## 7. Overview of JBLM Plans and Policies

The JLUS existing conditions research included review of several documents produced by JBLM, with relevance to land use compatibility. These documents include:

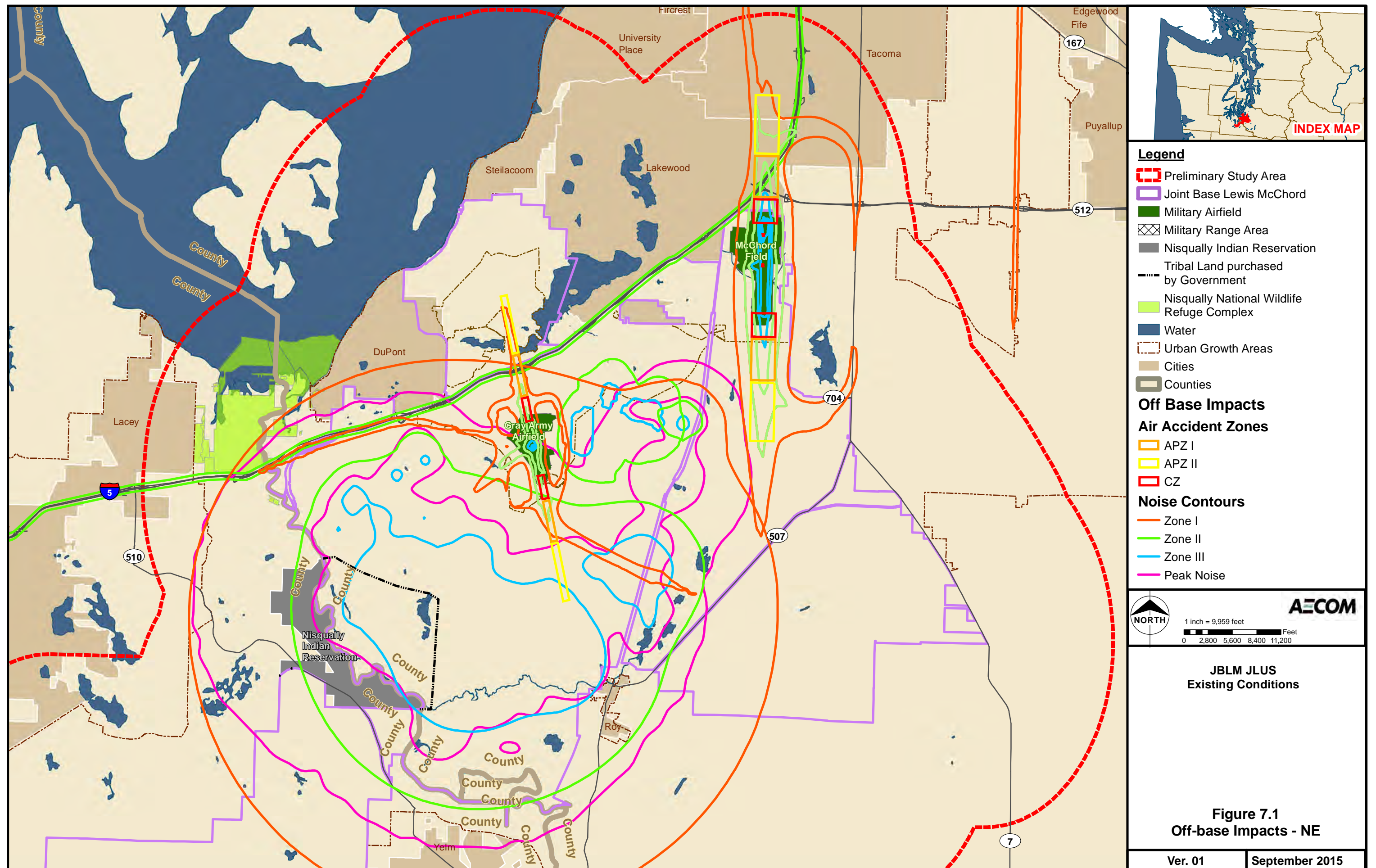
- Draft JBLM 2014 Master Plan and Supporting Documents.
- Draft Air Installation Compatible Use Zone Study (AICUZ) – 2014.
- Draft Installation Operational Noise Management Plan (IONMP) – 2014.  
*Note: Master Plan, AICUZ, and IONMP are draft pending completion of an Environmental Assessment.*
- Range Complex Master Plan (RCMP).

The Draft AICUZ and Draft IONMP studies are of particular importance to the JLUS; noise contour data generated by those reports will affect subsequent analyses of land use compatibility. As of May 2015, both of these documents are currently in draft form and are being updated to account for additional C-17 training flights. The final information is hereby incorporated by reference upon finalization. A summary of off-base impacts derived from the preliminary data is shown on Figures 7.1 and 7.2.

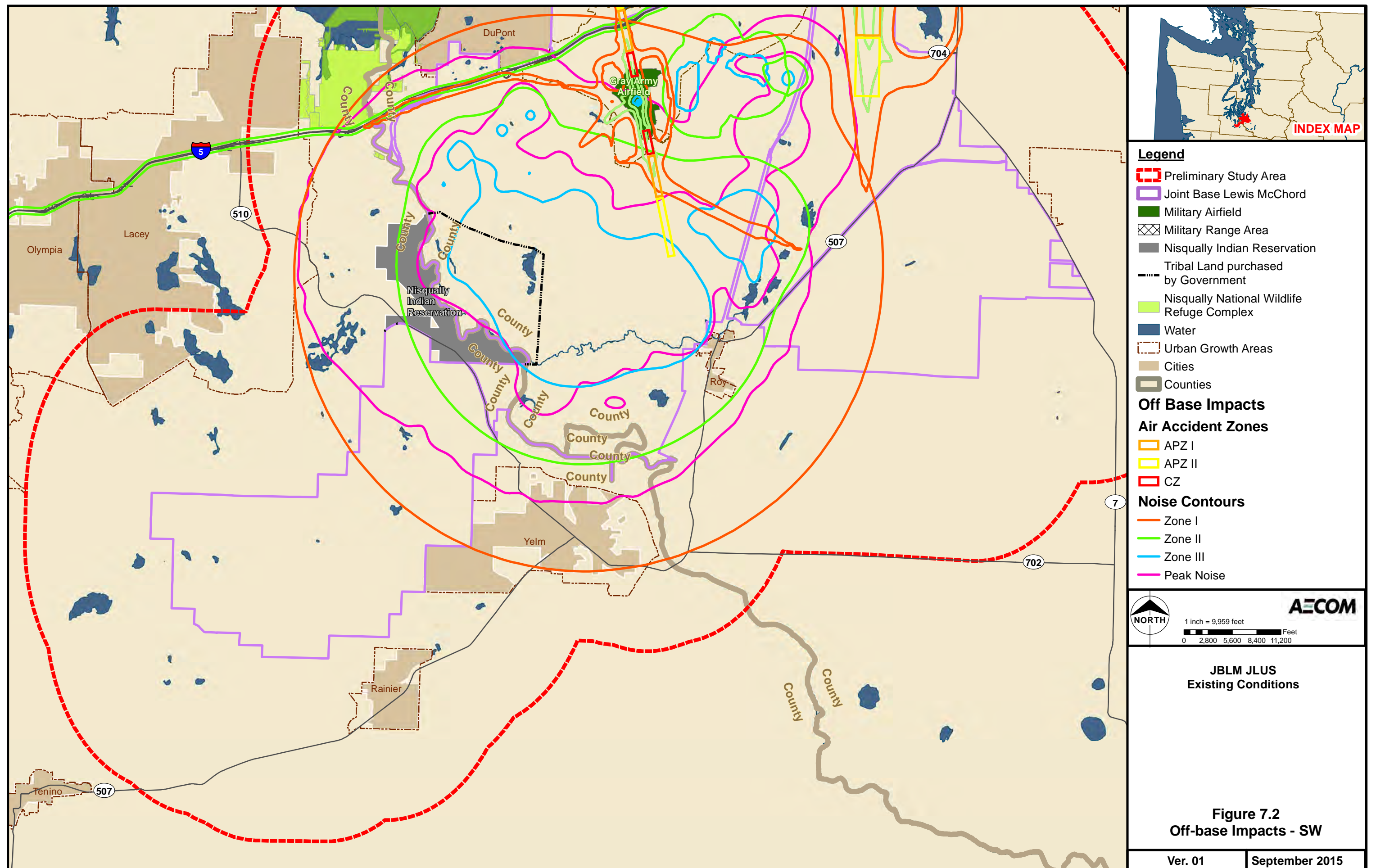
The Draft JBLM Master Plan identifies priorities for future base growth over the next 20 years and is thus of importance when evaluating potential land use conflicts. The RCMP describes range and training activities and their locations.

Key themes and issues that emerged from review of the JBLM documents include the following:

- Incompatible land uses exist to the north of McChord Field within the NCZ and APZs, and within areas subject to aircraft noise impacts.
- Noise impacts from artillery and other training operations are concentrated to the south and east of the installation.
- Past growth on Lewis North, including the newly opened Integrity Gate, has the potential for land use impacts in DuPont and Steilacoom.







The following are brief summaries of these four JBLM planning documents.

### 7.1. Air Installation Compatible Use Zone (AICUZ) Study – 2014 Draft

The primary purpose of the AICUZ study is to provide compatible land use recommendations within an AICUZ area of influence encompassing the Clear Zone (CZ), Accident Potential Zones (APZ) I and II, and land exposed to noise levels at or above the 65 decibel (dB) Day-Night Average A-Weighted Sound Level (DNL).

There are currently over 20,000 annual aircraft operations at McChord Field. Approximately 80% of flight operations are McChord-based C-17 aircraft, with 81% of operations occurring during daytime hours (7:00 am – 10:00 pm).

The AICUZ establishes three noise zones, as follows:

Noise Zone	Aviation DNL (dBA)	Land Use Recommendation
I	< 65	Generally acceptable with any residential or noise-sensitive uses.
II	65–75	Normally not recommended with residential or noise-sensitive uses.
III	>75	Not recommended with any residential or noise-sensitive uses.

Noise zones, the CZ, and APZs were overlaid on existing zoning to identify incompatible land uses. Table 7.1 below (reproduced from the AICUZ study) summarizes the extent of potentially incompatible land uses.

**Table 7.1. Acreage within Noise Zones, CZ, and APZs.**

Category	Acreage Within CZs and APZs			Acreage Within Noise Zones, Not Included in CZs and APZs				Total
	Clear Zone	APZ I	APZ II	65-69	70-74	75-79	80+	
Air Corridor/Clear Zone	46	-	-	-	-	-	0	46
Commercial	0	21	49	-	0	0	0	70
Industrial	5	-	-	-	-	-	0	5
Public/Institutional	0	8	0	-	0	0	0	8
Mixed Use <sup>1</sup>	0	0	0	8	0	0	0	8
Open Space/Recreation	0	0	17	-	0	0	0	17
Residential	0	8	171	33	0	0	0	212
<b>Total</b>	<b>51</b>	<b>37</b>	<b>237</b>	<b>41</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>366</b>
<sup>1</sup> “ “ Represents compatible land use Mixed use was characterized as potential residential land use zone.								

Key considerations to note, based on this analysis, include the following:

- Approximately 51 acres of incompatible land uses exist in the CZ.
- Most commercial and residential land uses are considered incompatible in APZ I. In total, 37 acres of such development exists.

- Residential development at densities greater than 2 dwelling units/acre in addition to some commercial and recreational uses are considered incompatible in APZ II. In total, 237 acres of incompatible development exists in this zone.
- Within the DNL 65-74 dB zones, residential development may be compatible if it incorporates noise level reduction (NLR) materials, but is generally discouraged unless there is a demonstrated community need and a lack of viable alternatives. There are 33 acres of residential development and 8 acres of mixed-use development within these zones.

## 7.2. Installation Operational Noise Management Plan (IONMP) – 2014 Draft

The IONMP analyzes exposure to noise and safety hazards associated with military operations. The IONMP establishes three Noise Zones (NZ I, II, and III) and a Land Use Planning Zone (LUPZ) to classify noise impacts and define land use compatibility, as shown in Table 7.2 below (reproduced from the IONMP).

**Table 7.2.**  
**Army Land**  
**Use Planning**  
**Guidelines**

Noise Zone	Aviation ADNL (dBA)	Impulse CDNL (dBC)	Small Arms (dBP)
<b>Land Use Planning Zone</b>	60 – 65	57 – 62	N/A
<b>I</b>	<65	<62	<87
<b>II</b>	65-75	62-70	87-104
<b>III</b>	>75	>70	>104
Notes: ADNL – A-weighted Day-Night Levels. CDNL – C-weighted Day-Night Levels. dBA – A-weighted decibel dBC – C-weighted decibel dBP – peak sound level  Source: USACHPPM 2005.			

The IONMP notes the following conclusions:

- Off-installation noise impacts are primarily attributed to artillery training and aircraft operations.
- Howitzer training in the summer months leads to noise complaints in Thurston County, south and east of JBLM.
- Large caliber arms noise is influenced by meteorological conditions and can result in noise complaints from elsewhere in the region.
- NZ II, III, and LUPZ from large caliber arms extend off the installation, affecting DuPont, Roy, Yelm, and the Nisqually Indian Reservation.



- NZ II, III, and LUPZ from Gray Army Airfield do not extend beyond the installation boundary.
- NZ II, III, and LUPZ from McChord Field extend off the installation and affect some incompatible land uses.

### **7.3. Range Complex Master Plan (RCMP)**

The RCMP establishes the range and maneuver land requirements to support the installation training missions, and identifies encroachment issues that impact use of the range complex. The RCMP notes that JBLM has sufficient training land to accommodate platoon and below training, while company and above maneuver training is better suited at the YTC. Several challenges are noted, including the presence of threatened and endangered species, buffer requirements for wetlands and water bodies, and the presence of Unexploded Ordnance (UXO) in some areas, all of which limit where and how training operations are conducted. The RCMP also notes that restricted airspace is becoming crowded, especially since the stationing of the Combat Aviation Brigade (CAB) and arrival of Unmanned Aircraft Systems (UAS). JBLM is seeking off-base routes and Helicopter Training Areas (HTAs).

### **7.4. Joint Base Real Property Master Plan – 2014 Draft**

The JBLM Real Property Master Plan guides the future physical development of the joint base over a 20-year planning horizon by identifying a vision for future growth and establishing real property planning controls, including an Installation Development Plan (IDP).

The IDP contains an Illustrative Plan, Regulating Plan, and a series of Network Plans for each of 17 areas (Area Development Plans, or ADPs), as well as overall plans covering the whole installation. The Illustrative Plan graphically depicts a hypothetical full build-out of the installation if the Master Plan were carried to completion. The Regulating Plan is the installation's regulatory mechanism that acts as a form-based zoning code that establishes allowed uses, and regulates building form, height, lot placement, and other building design aspects. The Network Plans identify the major transportation, bike and pedestrian, and open space networks.

Lewis North, north of I-5, is targeted for much of the future base growth, including housing and mission facilities. This potential growth, along with recent growth, and the projected opening of the new Integrity Gate in early 2015, has the potential to impact the nearby communities of DuPont and Steilacoom with increased traffic and increased demand for housing and other services.

## 8. Overview of Environmental Plans, Policies, and Initiatives

The presence of several federally listed threatened or endangered species and their habitats on and off JBLM poses a significant compatibility challenge. Species of concern include anadromous fish, the Mazama pocket gopher, Taylor's checkerspot butterfly, and streaked horned lark. Environmental conditions in the study area are shown on Figure 8.1. Critical habitat (outside of JBLM in Figure 8.1) is designated by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA). This habitat consists of geographic areas that contain features essential for the conservation of a threatened or endangered species and may require special management and protection. Critical habitat may not be modified in a way that negatively affects listed species. Priority habitat (on JBLM, shown on Figure 8.2) encompasses areas where the listed species habitat will be managed similar to critical habitat.

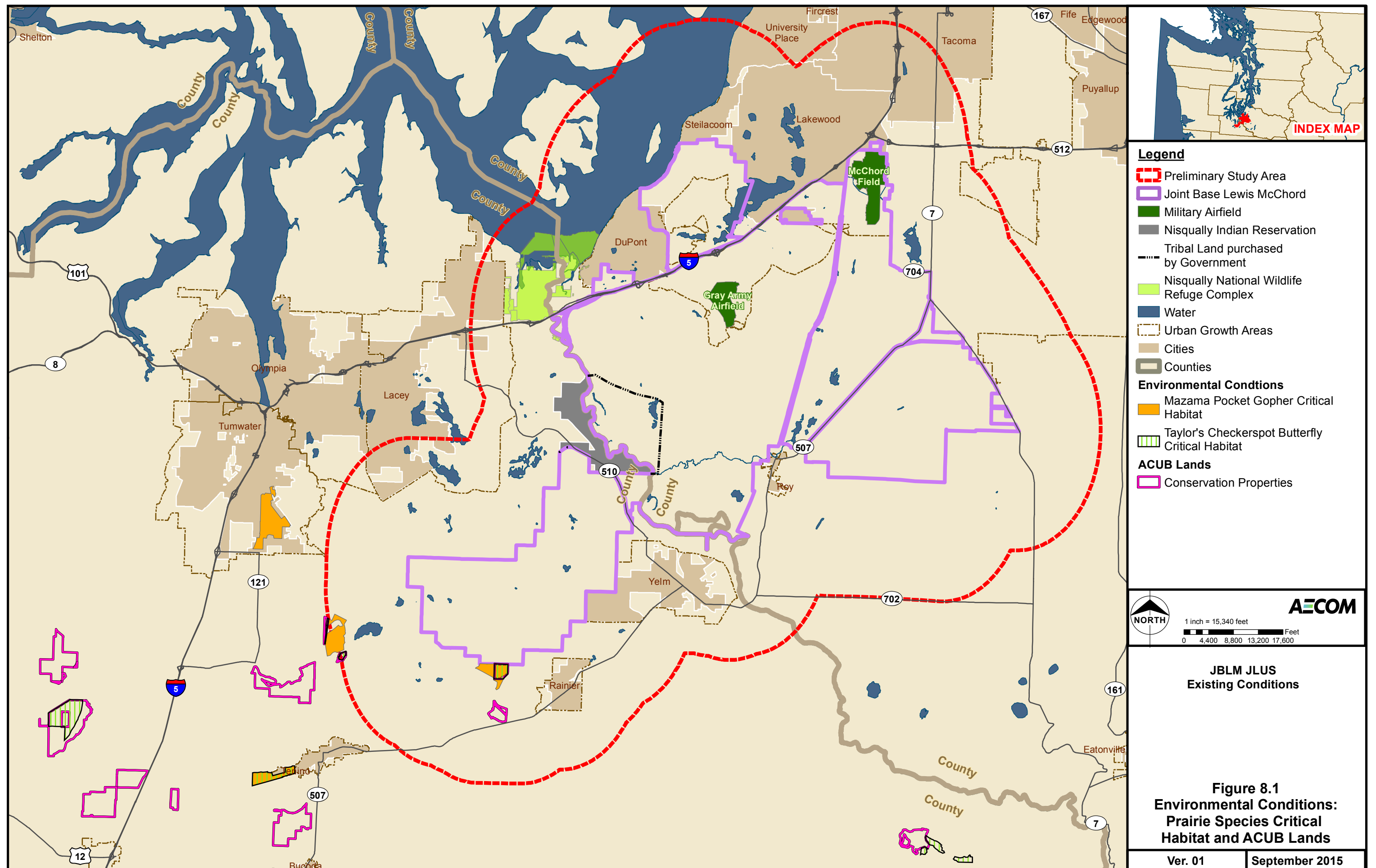
Management of habitat for these species has occurred via a variety of approaches, some of which are currently in the developmental stages. Management of habitat on JBLM is directed by the Integrated Natural Resources Management Plan (INRMP), which is currently in the process of being updated to address the newly listed prairie species. JBLM also has in place several Endangered Species Management Plans (ESMPs).

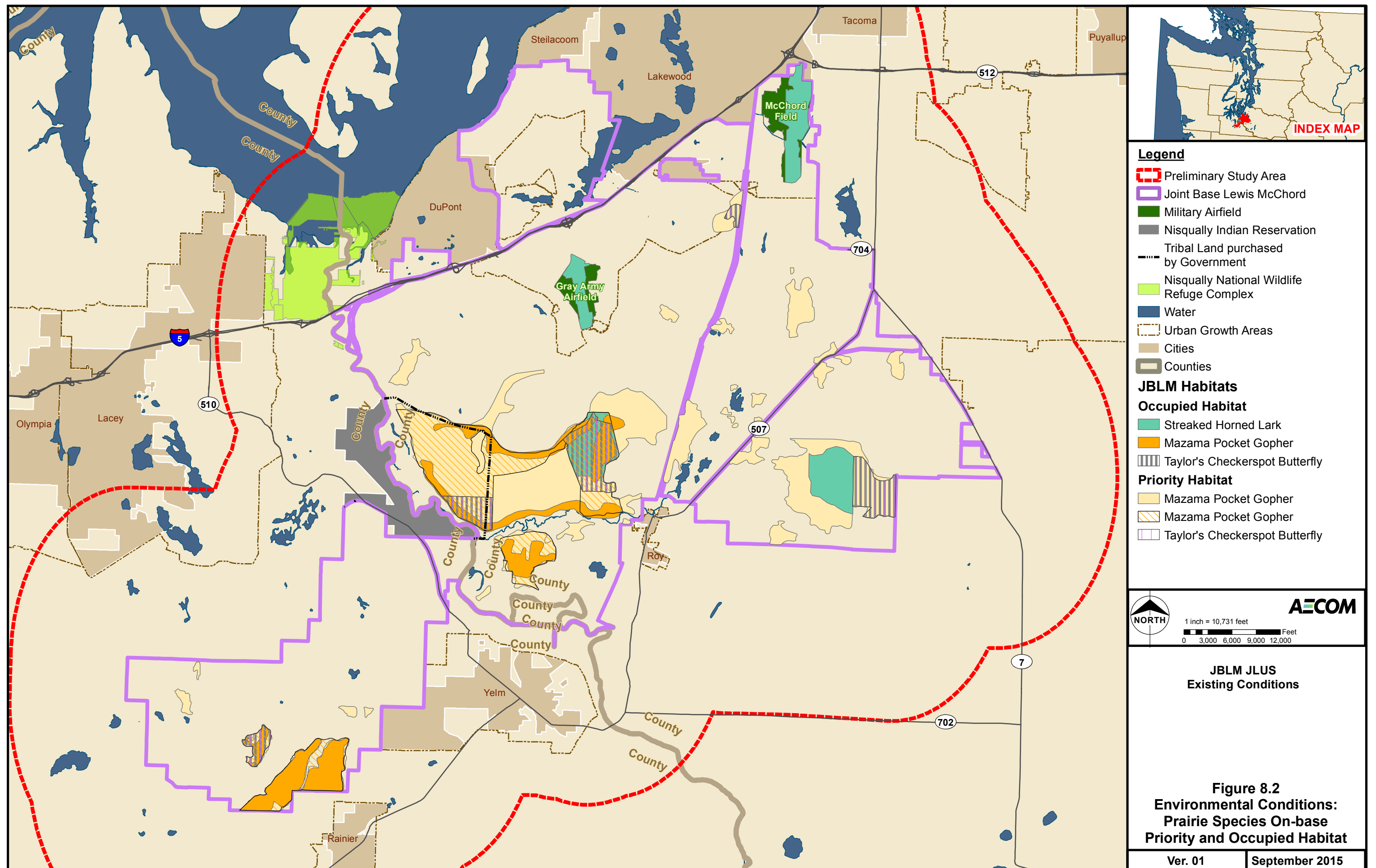
The Army Compatible Use Buffer (ACUB) program has provided funding for the acquisition and management of properties off the installation intended for preservation of prime prairie habitat. ACUB program properties are shown on Figure 8.2.

Thurston County manages critical areas, including habitat for fish and for prairie species, through its critical areas ordinance (CAO). Thurston County is also in the process of developing a Prairie Habitat Assessment Methodology (PHAM) that will establish a system of credits that can be used as mitigation for prairie habitat impacts associated with development proposals.

Several environmental documents were reviewed to establish a baseline understanding of relevant environmental issues in the study area. These documents are summarized below. Documents reviewed include:

- JBLM Integrated Natural Resources Management Plan (INRMP) 2007-2011.  
*Note: INRMP in process of being updated.*
- JBLM Endangered Species Management Plans (ESMP):
  - Mazama Pocket Gopher (2014).
  - Streaked Horned Lark (2013).
  - Taylor's Checkerspot Butterfly (2013).
- JBLM Army Compatible Use Buffer (ACUB) Annual Report.
- Federal Register Notice for Listing of Mazama Pocket Gopher & Critical Habitat.
- Thurston County Critical Areas Ordinance (CAO).
- Thurston County Prairie Habitat Assessment Methodology.
- Sequim Creek Watershed Restoration Planning Core Group Final Briefing Memo and Core Group Recommendations for a Restoration Plan.
- Environmental Assessment for Construction of a Wastewater Treatment Plant and Main Pipeline Infrastructure for Water Reuse at Joint Base Lewis-McChord, Washington.





### 8.1. Army Compatible Use Buffer Program

The ACUB Program covers prairie habitats and is intended to help minimize restrictions on military training associated with the recently listed Taylor's checkerspot, streaked horned lark, and Mazama pocket gopher. The overall goal of the program is to reduce environmental encroachment (restrictions on training) on JBLM associated with the listing or potential listing of prairie species under the Endangered Species Act by supporting the conservation of these species on lands off the installation. With the exception of a property in Clallam County and one possible property in Pierce County, all current and likely future ACUB properties are in Thurston County, which has most of the remaining, undeveloped prairie habitat in the South Puget Sound region.

The JBLM ACUB Program is designed primarily for habitat preservation to reduce environmental encroachment, although one parcel also prevents incompatible development along the installation boundary. In June 2013, JBLM was one of the winners of the Fiscal Year (FY) 13 REPI Challenge, and South Puget Sound became first pilot project in the Sentinel Landscapes Program, jointly run through the DoD, U.S. Department of Agriculture (USDA), and U.S. Department of the Interior (USDOl). The actions have resulted in a substantial expansion of the JBLM ACUB Program in terms of partners, land area, and funding.

Original partners to the program include the Center for Natural Lands Management (CNLM), Washington Department of Fish and Wildlife (WDFW), Washington State Department of Natural Resources (WDNR), and Wolf Haven International (a conservation non-governmental organization [NGO]). New partners as a result of REPI challenge include the USDA Natural Resources Conservation Service (NRCS), the U.S. Fish and Wildlife Service (USFWS), Thurston County, Sustainability in Prisons Program (SPP), Washington State Department of Veterans Affairs, and several private landowners. The current scope of operations is 5,968 acres in 16 locations. Total funding to date is about \$35 million, split evenly between DoD/Army and the partners.

Projects covered under the challenge are summarized below:

- Land acquisition projects (Dan Kelly Ridge, Mima Mounds addition, Violet Prairie-Scatter Creek Preserve).
- Habitat restoration and maintenance projects (invasive species control across ACUB lands, butterfly enhancement for Taylor's checkerspot at unoccupied sites, habitat maintenance and restoration at occupied sites, Taylor's checkerspot enhancement at the Bald Hills Natural Area Preserve, habitat improvement for Taylor's checkerspot off ACUB lands, cooperative integrated prescribed fire program, regional prairie seed production, regional native plug production, shared resources).
- Projects to increase the sizes and numbers of species populations (captive rearing and translocation methods for Taylor's checkerspot, genetic enhancement of Puget Sound lowland streaked horned lark populations, Mazama pocket gopher translocation).



- Research projects (native plant establishment, butterfly habitat strategy).
- Administration.

## 8.2.JBLM Endangered Species Management Plans

JBLM has ESMPs in place for the Mazama pocket gopher, streaked horned lark, and Taylor's checkerspot butterfly. ESMPs are required under Army Regulation (AR) 200-1. They comprise the Endangered Species Management Component of the INRMP. ESMPs include management measures to protect, maintain, and enhance (if needed) populations of federally listed, proposed, and candidate species and their habitat. JBLM's ESMPs are prepared with input from the Directorate of Plans, Training, Mobilization, and Security (DPTMS); JBLM Fish and Wildlife; USFWS, and WDFW. ESMPs attempt to minimize conflicts between training activities and species management strategies. The goal is to have no net loss in the military mission.

Summaries of key points from each of these ESMPs is included below.

### 8.2.1. Mazama Pocket Gopher ESMP

- The ESMP covers the Mazama pocket gophers on JBLM
- Current status of species: of the eight subspecies that occur in Washington, four are federally listed as threatened (4/2014, 79 Federal Register [FR] 19760-19796): Roy Prairie pocket gopher (*Thomomys mazama glacialis*), Olympia pocket gopher (*T.m. pugetensis*), Tenino pocket gopher (*T.m. tumuli*), and Yelm pocket gopher (*T.m. yelmensis*).
  - Of the listed subspecies, the Roy prairie and Yelm pocket gopher occur on JBLM land in Pierce and Thurston counties, respectively.
  - On JBLM, the currently known distribution of Mazama pocket gophers includes four large areas: the 91<sup>st</sup> Division Prairie (Artillery Impact Area; Roy Prairie ssp.), Marion Prairie and the South Impact Area (Roy Prairie ssp.), Weir Prairie (Yelm ssp.), and Johnson Prairie (Yelm ssp.).
  - Critical Habitat has been designated in Thurston County for the Olympia, Tenino, and Yelm ssp. (4/2014, 79 FR 19712-19757). Critical habitat has not been designated on JBLM because the approved ESMPs and INRMP effectively manage habitat.

#### Brief species/habitat overview

- Currently patchily distributed in western Washington.
- Primarily located in glacial outwash prairies, which are much reduced from historical coverage.
- Pocket gophers are most likely to be located in areas with less than 10 percent cover of woody vegetation. Less prevalent in soils with lots of rock/cobbles.
- Remain active year-round, breed from March through June.
- Solitary, asocial animals, with limited dispersal capabilities.
- Construct burrow systems where they spend most of their time. Harvest roots and bulbs for food from underground.

### **Brief overview of threats**

- Vulnerable to local extinction because of limited, small populations. Need yearly successful reproduction to persist.
- Glacial outwash prairies have become fragmented, degraded, reduced in size, or lost completely. Habitat loss (including loss of habitat connectivity) is due to residential and commercial development, conversion to agriculture, encroachment of woody vegetation, and military training.
- Other threats: control as a pest species, predation, small population effects, and other disturbance and development of grassland habitats.

### **Summary of specific recommendations or conclusions**

- Conservation goals: (1) maintain, protect, and contribute to recovering populations both on and off DoD lands; (2) protect and enhance suitable and priority habitat areas, including increasing the amount and quality of suitable habitat for the species within priority habitat areas; (3) develop long-term survival strategies; (4) continue to support regional recovery efforts (ACUB and others); and (5) provide for no net loss in the capability of installation lands to support the military missions.
- Conservation actions identified in ESMP:

#### For Goal 1

- Continue to enforce restrictions that protect pocket gopher populations, which apply to all parties training or recreating on priority habitat areas.
- Attend range walks with trainers to coordinate restrictions specific to Range 74/76 and other areas where the species occurs.
- Maps and written and verbal instructions regarding the types, locations, and timing of activities that are allowed or disallowed.
- Review planned military construction or maintenance activities, recreational events, and other civilian projects in priority habitats to identify associated risks.
- Participate in regional research efforts.
- Survey all potential habitat within or adjacent to priority habitat areas. Site condition monitoring annually, mound surveys every 3 years. Follow approved survey protocols.
- Perform compliance, implementation, and effectiveness monitoring for the ESMP. Annual reports sent to USFWS. Establish adequate buffers around occupied areas.

#### For Goal 2

- Continue management of habitat areas to improve/restore habitat conditions. Management actions include prescribed fire, small-scale planting enhancement plots, and control of encroaching woody plants and invasive species.

- Oversight of prescribed burns by Fish and Wildlife Program personnel to maintain low-statured native vegetation in prairie habitat. Consider Taylor's checkerspot and streaked horned lark when planning burns.
- After control of invasive species, immediately re-establish native plant species. Avoid disturbing gophers or limiting availability of forage vegetation.

For Goal 3

- Expand populations both on and off JBLM.
- Lift training pressures in areas occupied by pocket gophers by creating new training areas, preferably in places not occupied by listed species.

For Goal 4

- Facilitate, fund, and implement regional recovery efforts (prevent further decline of the species and increasing population size of four Thurston/Pierce subspecies), including prairie land acquisition and restoration of degraded habitats.
- Provide annual funding for development of management strategies.
- Work cooperatively with agencies and NGOs.

For Monitoring Plan

- Survey all potential habitat within priority habitat areas for pocket gophers. Goal is to develop a suitable survey protocol approved by USFWS/WDFW. Work with USFWS to determine suitable buffers to place around occupied areas.
- Work cooperatively with federal, state, and NGO partners to develop and implement a population monitoring plan that will allow JBLM to track population status of the subspecies on/off installation.
- Monitor military training to determine effects, and to ensure training in compliance with INRMP. Monitor effectiveness of conservation commitments and implementation of management actions in the INRMP and ESMP.
- Provide monitoring reports annually to USFWS.

### 8.2.2. Streaked Horned Lark

#### **Species/habitat/geographic area covered**

- ESMP covers streaked horned larks on JBLM.
- Current status of species: federally listed as threatened (10/2013, 78 FR 61451-61503).
- On JBLM, nesting streaked horned larks occur on Gray Army Airfield, McChord Field, Range 74/76, Range 50, TA6, and the 13<sup>th</sup> Division Prairie.
- Critical habitat has been designated in Washington, but not in Pierce or Thurston counties (10/2013, 78 FR 61505-61589).

#### **Brief species/habitat overview**

- Occur in prairies of western Washington and Oregon; prefer breeding territories that are sparsely vegetated and contain open, rocky areas between the vegetation.

- In the south Puget Sound, nesting locations occur at regional airfields and prairie areas. Populations are restricted to four sites on JBLM and to the Olympia and Shelton airports.
- Place nests on the ground, usually at the base of perennial forbs.
- Overwinter in open habitats, focusing on areas of bare ground lacking trees and shrubs; feeding also occurs in areas with short, sparse vegetation and bare ground.
- Nest building in Puget Sound region begins in late April to mid-May, and all nesting activity is completed by late August.
- Populations in Washington are mostly migratory, with a few birds remaining over the winter; most of the streaked horned larks in Washington are believed to winter along the lower Columbia River and in the Willamette Valley, Oregon.

#### **Brief overview of threats**

- Main threats: habitat loss and degradation due to agricultural and urban development, successional changes, military training, and the spread of invasive plants.
- Other threats: predation, inadequate regulatory mechanisms, low genetic diversity, small populations, low reproductive success, declining population sizes, and aircraft strikes.
- In Washington, nest failure is one of the most significant threats. Causes: human disturbance, predation, inbreeding, and nest parasitism.
- On JBLM, military training and recreation activities that crush nests, eggs, or young, or that disturb nesting adults are threats. Also activities that alter habitat so that it is no longer suitable for nesting.

#### **Summary of specific recommendations or conclusions**

- Must address the needs of the streaked horned lark while ensuring that management activities are fully vetted with the training community.
- Conservation goals: (1) protect and support recovery of populations both on and off DoD lands; (2) protect and enhance suitable and priority habitat areas, including increasing the amount of suitable habitat for the species within priority habitat areas; (3) develop, implement, and monitor long-term survival strategies; (4) continue to support regional recovery efforts (ACUB and others); and (5) protect, enhance, and sustain native prairie seed bed nursery capabilities of the Range Support and Fish and Wildlife Programs.
- Conservation actions identified in ESMP:  
For Goal 1
  - Continue to enforce restrictions that protect lark populations, which apply to all parties training or recreating on priority habitat areas.



- Attend range walks with trainers to coordinate restrictions specific to Range 74/76 and other areas where the species occurs.
- Maps and written and verbal instructions regarding the types, locations, and timing of activities that are allowed or disallowed.
- Review planned military construction or maintenance activities, recreational events, and other civilian projects in priority habitats to identify associated risks.
- Participate in regional research efforts.
- Survey annually for occupied habitat, and mark nests to protect them from disturbance/destruction.

For Goal 2

- Continue management of habitat areas to improve/restore habitat conditions. Management actions include prescribed fire, small-scale planting enhancement plots, and invasive species control.
- Prescribed burns within half of all suitable habitat (except airfields) each year to maintain habitat.
- After control of invasive species, immediately re-establish native plant species.

For Goal 3

- Participate in regional recovery efforts to enhance existing populations on and off JBLM.

For Goals 4 and 5

- Facilitate, fund, and implement regional recovery efforts (increasing the number and size of populations both on and off JBLM, prairie land acquisition, habitat restoration) and native seed bed nursery programs.
- Provide annual funding for development of management strategies.
- Work cooperatively with agencies and NGOs.

For Goal 6

- Survey all potential habitat within or adjacent to priority habitat areas annually for occupancy. Follow established survey protocols. Mark off occupied areas plus buffers.
- Monitor military training to determine effects, and to ensure training in compliance with INRMP. Monitor effectiveness of conservation commitments and implementation of management actions in the INRMP and ESMP.
- Provide monitoring reports annually to USFWS.

### **8.2.3. Taylor's Checkerspot Butterfly**

#### **Species/habitat/geographic area covered**

- ESMP covers Taylor's checkerspot butterflies on JBLM. Occurs in prairie habitats.
- Current status of species: federally listed as endangered (10/2013, 78 FR 61451-61503).

- On JBLM, populations of Taylor’s checkerspot occur within the Artillery Impact Area (AIA), on Ranges 72-79 and 50, and on the Seibert-staked area (off-limits to certain types of training) near Pacemaker airstrip on Training Area (TA) 14.
- The population in Ranges 72-79 is the source population for the WDFW captive rearing program. Range 50 is a translocation site, and some translocated butterflies also occur in TA 14.

#### **Brief species/habitat overview**

- The current range of the Taylor’s checkerspot includes eight sites in Washington, two in Oregon, and one in British Columbia.
- The species is associated with grasslands that contain a diversity of larval host and nectar plants surrounded by fescue or other short-statured grassland species.
- Life cycle is dependent on larval host and nectar plants. They are resident and non-migratory, and produce one brood per year. Adults emerge in early-April to mid-June.
- Landscape heterogeneity is an important habitat consideration. Structural elements of open grasslands, such as forest edges and wet meadows, provide habitat features.

#### **Brief overview of threats**

- The Taylor’s checkerspot is listed because of significant population declines range-wide; habitat loss and degradation due to human-related activities; habitat modification caused by encroachment of invasive non-native plants; succession from grasslands to native shrubs and trees.
- Primary threat range-wide is direct habitat loss.
- On JBLM, threats include air operations, vehicle and foot traffic, and other types of training; invasion of non-native grasses that modify native grassland habitat structure; and frequent wildfire in the AIA.

#### **Summary of specific recommendations or conclusions**

- Must address the needs of the Taylor’s checkerspot while ensuring that management activities are fully vetted with the training community.
- Conservation goals: (1) protect and contribute to the recovery of populations both on and off DoD lands; (2) protect and enhance suitable and priority habitat areas, including increasing the amount of suitable habitat for the species within priority habitat areas; (3) develop, implement, and monitor long-term Taylor’s checkerspot butterfly survival strategies; (4) continue to support regional recovery efforts, primarily through the JBLM ACUB and the USFWS recovery programs; and (5) protect, enhance, and sustain native prairie seed bed nursery capabilities of the Range Support and Fish and Wildlife Programs.

- Conservation actions identified in ESMP:

For Goal 1

- Continue to enforce vehicular movement restrictions, which apply to all parties training or recreating on priority habitat areas.
- Attend range walks with trainers to coordinate restrictions specific to Range 74/76 and other areas where the species occurs.
- Maps and written and verbal instructions regarding the types, locations, and timing of activities that are allowed or disallowed.
- Review planned military construction or maintenance activities, recreational events, and other civilian projects in priority habitats to identify associated risks.
- Participate in regional research efforts.
- Survey annually for occupied habitat. Use Seibert stakes to demarcate priority habitat areas.

For Goal 2

- Continue management of habitat areas to improve/restore habitat conditions. Management actions include prescribed fire, small-scale planting enhancement plots, and invasive species control.
- After control of invasive species, immediately re-establish native plant species.

For Goal 3

- Participate in regional recovery efforts to enhance existing populations and establish new populations.
- Focus on captive rearing and propagation from current JBLM population, and release onto suitable habitat on/off installation.
- Maintain and provide resources for native prairie seed bed.

For Goals 4 and 5

- Facilitate, fund, and implement the ACUB program (prairie land acquisition, restoration of habitat, increasing the number and size of populations on acquired lands) and native seed bed nursery programs.
- Provide annual funding for development of management strategies.
- Work cooperatively with agencies and NGOs.

For Goal 6

- Survey occupied sites on JBLM and ACUB lands annually. Follow established survey protocols.
- Monitor military training to determine effects, and to ensure training in compliance with INRMP. Monitor effectiveness of conservation commitments and implementation of management actions in the INRMP and ESMP
- Provide monitoring reports annually to USFWS.

### **8.3. Thurston County Prairie Habitat Assessment Methodology (PHAM)**

Thurston County is currently developing the PHAM, which is described in a protocol document and a procedure manual. The protocol describes the overall process, which

involves obtaining permits under the interim permitting strategy, creating prairie credits for mitigation, developing eligibility criteria for mitigation and obtaining credits, and managing the program. The procedure manual describes the procedures for collecting field data, running the Species and Habitat Asset and Risk Prioritization (SHARP) model, and using model results to define the proposed/future condition. The SHARP Model Documentation documents the assumptions, background, equations, and indicators used by the Thurston County PHAM Version 1.0 of the model.

Guiding principles of the PHAM are to protect and maintain prairie ecosystems and prairie-associated species in perpetuity; provide a mechanism to maintain local control over permitting decisions related to habitat; and allow for long-term economic certainty and responsible economic development.

### **Brief Overview of Methodology**

- The methodology produces an estimate of the number of weighted acres of Potentially Suitable Habitat (area and quality of prairie being conserved) or Potentially Affected Habitat (area and quality of prairie being impacted). Potentially Affected Habitat = debits; Potentially Suitable Habitat = credits.
- Applicable to a defined set of potential land uses and development activities. Additional activities likely included in the future.
- Mitigation sequencing must be followed.
- Mitigation occurs within the boundaries of Thurston County, except under rare circumstances.
- Impacts on a particular subspecies of pocket gopher must be mitigated within the geographic area known to support that species.
- As a default, off-site mitigation on large sites is preferred. In some instances onsite is preferable.
- SHARP is used to determine mitigation obligation (debits) for activities on prairie parcels of a certain size or occupied by target prairie-associated species.
- SHARP is run twice: on the current condition, and on the proposed future condition (15 years in the future).
- Mitigation obligation is determined based on the most significantly impacted species.
- SHARP can also be used to quantify credits for eligible mitigation sites and conservation activities, as determined by Thurston County and USFWS. Credits are only calculated using the post-project estimate of Potentially Suitable Habitat.
- For all mitigation sites, the credit developer is responsible for conducting ongoing monitoring and demonstrating progress toward meeting the performance standards outlined in their mitigation instrument.

### **Brief Overview of Data Gathering and Running SHARP**



- In office data: soil type (for prairies and prairie-associated species), grasslands on aerial imagery (for streaked horned lark), 75-foot buffer from parcel boundary to determine field survey area.
- Field data: transects 25 meters apart, collecting data every 25 meters (data on cover of various types of vegetation, presence of gopher mounds, presence of oviposition and larval host plants for Taylor's checkerspot, presence of nectar species for Taylor's checkerspot).
- Define assessment area for the SHARP model.
- Follow instructions for running model to obtain desired outputs.

#### **Summary of specific recommendations or conclusions**

- Methodology will be used as part of an Interim Permitting Plan and the Habitat Conservation Plan for Thurston County. Will be used by permittees, credit developers, and program administrators.

### **8.4.Sequalitchew Creek Watershed – Final Briefing Memo and Core Group Recommendations for a Restoration Plan**

The document presents the set of recommended actions adopted by the South Puget Sound Salmon Enhancement Group to include in a restoration plan for the Sequalitchew River Watershed. The actions were developed by a Core Group of stakeholders that included representatives from the City of DuPont, Ecology, the Environmental Caucus, CalPortland Company, the Nisqually Indian Tribe, the Sequalitchew Creek Watershed Council, JBLM, and Pierce County.

The document covers the Sequalitchew Creek Watershed, located in Pierce County, Washington. Important habitats in the watershed that are addressed include streams, lakes, wetlands, and the Nisqually River estuary.

The vision for the restoration plan is to “identify actions and probable project costs necessary to restore flows and ecological conditions suitable for native salmonid populations in the Sequalitchew Creek basin.” Actions identified in this document are intended to improve salmonid species that use aquatic habitats in the watershed. Species identified by name in the document include Chinook, chum, and coho salmon, but other species would also benefit.

Four phases of recommended actions were identified:

- **Phase 0:** update the City of DuPont's CAO to allow restoration actions.
- **Phase 1:** rehabilitate east-west flow from Sequalitchew Lake to West Edmond Marsh (seasonally manage lake levels, manage beaver dams and beavers in watershed, monitor flows through Edmond Marsh and adaptively manage flexible levelers, rehabilitate and monitor the Losing Reach, begin the planning process for components of Phases 3 and 4).

- **Phase 2:** improve fish passage and habitat from West Edmond Marsh through the ravine (complete additional actions to enhance the Losing Reach, replace the Losing Reach near City Hall, evaluate and modify the Center Drive Culvert, adaptively manage flows and habitat changes within the ravine, support efforts to restore the mouth of Sequelitchew Creek<sup>1</sup>, install weir in Hamer Marsh, monitor water quality in Hamer Marsh).
- **Phase 3:** rehabilitate flow and fish passage through the DuPont Railroad Trail (investigate subsurface conditions, improve flow connectivity and fish passage through the trail, create a southern flow alignment).
- **Phase 4:** restore flows and fish passage to Sequelitchew Lake (replace/remove the JBLM crossover culverts, replace the JBLM 12-inch culvert between Hamer and Edmond Marsh if water quality in Hamer Marsh meets water quality standards, change the JBLM water supply to a deep well system).

Expected outcomes of each of the phases are as follows:

- **Phase 1** should improve gradient flow from Sequelitchew Lake to West Edmond Marsh. The Edmond Marsh complex may decrease in size as a result of Phase 1 actions. Work will also begin on the Losing Reach and on planning for future phases.
- **Phase 2** should provide the ability for coho, winter chum, and possibly other salmonids to access habitat in Sequelitchew Creek from the estuary into West Edmond Marsh. It should also improve groundwater recharge from Hamer Marsh.
- **Phase 3** should create the opportunity for fish passage all the way from the estuary to the easternmost end of East Edmond Marsh. It would also reduce the need to manage beaver activity through the DuPont Railroad Trail, and should improve water quality.
- **Phase 4** would further enhance flows between Hamer and Edmond Marshes, and would restore nearly all flows from Sequelitchew Lake and Sequelitchew Springs into Sequelitchew Creek. It also would provide fish passage to the lake.

### **8.5.JBLM Wastewater Treatment Plant Environmental Assessment**

The Environmental Assessment discloses the environmental impact of JBLM's proposed action to construct a new wastewater treatment plant (WWTP) and reclaimed water distribution system (RWDS) extending from the new plant throughout the installation.

The purpose of the action is to provide the necessary sewage treatment capability to improve water quality discharges into Puget Sound, reduce on-base potable water consumption by 2 percent per year by 2015, and to construct a state-of-the-art facility that will meet federal water quality regulatory and sustainability requirements on JBLM.

The need for the Proposed Action is to improve the quality of wastewater leaving the installation with the construction of a new WWTP that will eliminate or reduce the permit exceedances that have occurred place with the outdated Solo Point WWTP. There is a need

to reduce the amount of wastewater and improve the quality of discharge into Puget Sound, and to provide a new source of water for irrigation and industrial facilities. The Solo Point WWTP has resulted in 18 permit exceedances since 2009, and is projected to fail in 5 to 7 years.

The EA covers all plant and animal species that occur within the action area. Marine species are of interest because of the WWTP outfall and impacts from discharge into Puget Sound. Endangered, threatened, and candidate species that were identified as likely or potentially present in the action area include bull trout, Chinook salmon, steelhead, Pacific eulachon, canary rockfish, yelloweye rockfish, bocaccio, marbled murrelet, streaked horned lark, and southern resident killer whale.

### Summary of specific recommendations or conclusions

- Both action alternatives would result in similar effects to resources and meet the project purpose and need.
- All effects could be readily mitigated through avoidance and careful project design, and mitigation measures and best management practices (BMPs) are listed.
- Neither of the action alternatives would result in significant, unmitigatable adverse impacts; however, under the Preferred Alternative mitigation measures would be required to compensate for adverse effects to water, biological resources, and cultural resources. Adverse effects to soils would be mitigated through the National Pollutant Discharge Elimination System (NPDES) compliance process. The effects determination for the Preferred Alternative cannot be completed until subsequent National Environmental Policy Act (NEPA), Section 106, and Section 7 consultation is completed for the RWDS and outfall construction to ensure planned activities are consistent with the programmatic assumptions outlined in the EA.
- Implementation of Alternative B would reduce identified impacts, including significant impacts (including water quality) that were identified in the No Action Alternative to acceptable levels. Therefore, an Environmental Impact Statement (EIS) is unnecessary for implementation of Alternative B, and a Finding of No Significant Impact (FONSI) is appropriate.

## 8.6. Summary of Threatened and Endangered Anadromous Fish and Habitats

The study area contains habitat for a variety of listed anadromous fish species. These include the threatened Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*), threatened Puget Sound steelhead trout (*O. mykiss*; Coastal-Puget Sound Distinct Population Segment [DPS]), and threatened bull trout (*Salvelinus confluentus*).

The north portion of JBLM provides habitat for outmigrating juvenile and in-migrating adult anadromous salmonids using the Nisqually River to the south and Chambers Creek to the north. Most spawning of Chinook near JBLM occurs in the mainstem of the Nisqually River.

Principal spawning months are July through September. The Nisqually River has both winter- and summer-run steelhead. Bull trout have been observed in the Nisqually River, which passes through JBLM, although not in large numbers; most likely foraging fish.

In addition to anadromous fish in the study area, a number of listed marine fish species exist in Puget Sound adjacent to JBLM:

- Pacific eulachon (*Thaleichthys pacificus*; Southern DPS) – Threatened
- Canary rockfish (*Sebastes pinniger*) – Threatened
- Yelloweye rockfish (*Sebastes ruberrimus*) – Threatened
- Boccacio (*Sebastes paucispinis*) – Endangered

Two of the primary factors responsible for the decline of the three rockfish species are habitat degradation and water quality problems, including low dissolved oxygen and elevated contaminant levels.

Rocky habitat utilized by these species is threatened by, or has been impacted by, derelict fishing gear, construction of bridges, sewer lines and other structures, deployment of cables and pipelines, and burying from dredge spoils and natural subtidal slope movement. Shoreline development along the Puget Sound is a factor.

Inputs of toxic chemicals into Puget Sound are a concern, as are sewage, animal waste, and nutrient inputs. Rockfish typically move out of areas with low dissolved oxygen, but may be killed if periodic surges of low dissolved oxygen occur.

#### **Puget Sound Water Quality Issues**

Nutrient loads, particularly nitrogen, have been identified as a potential stressor to the Puget Sound ecosystem. Low dissolved oxygen is a consequence of excessive nutrient loads. Nitrogen sources in the Puget Sound region include WWTPs and rivers that discharge directly into the Sound. On-site septic systems are another source of nutrient loads.

In South Puget Sound, rivers contribute 65% of dissolved inorganic nitrogen (DIN) annually. During the summer, rivers contribute 37% while WWTPs contribute 63%. Nutrient loads from Central Puget Sound, with inputs from more highly developed watersheds, may also impact SPS water quality. WWTP discharges within the study area come from: Chambers Creek, JBLM, McNeil Island, Boston Harbor, Seashore Villa, LOTT, Tamoshan, Carlyon Beach, Shelton



## 9. Summary of Stakeholder and Public Input

### 9.1. Stakeholder and Subject Matter Expert Interview Input

Stakeholder and subject matter expert (SME) interviews were conducted between May and August 2014 to gather input on a variety of topics. Interviews were conducted in person or by phone with JBLM representatives, representatives for landowners, government officials, elected officials, environmental interests, and economic development organizations. A small group meeting was also conducted with members and staff of the Nisqually Indian Tribe.

Interviewees were asked to provide their input on:

- Desired outcomes from the JLUS.
- Organizational goals and priorities.
- Communication needs and experiences.
- Policy and regulation changes.
- Data needs for the study.

Interviewees cited a wide variety of themes and issues, which are summarized below. Because of the large area influenced by JBLM and the different characteristics of each community, many of the topics tended to be geographically and community-specific. Even comments on major JLUS topics such as urban encroachment, endangered species, noise, and land uses in the McChord Airfield NCZ appear directly related to the commentor's proximity to specific activities on the installation.

Interviews were conducted with the following:

#### **JBLM**

- Mike Barton, JBLM Real Estate Office
- Vince Bozick, JBLM Directorate of Public Works (DPW) Master Planning Division
- Robert Bright, Directorate of Plans, Training, Mobilization, and Security (DPTMS), Gray Army Airfield Operations
- Scott Byrd, JBLM Directorate of Human Resources (DHR)
- Sallie Donahue, DPW Business and Operations Integration Division
- Jeff Foster, JBLM DPW Environmental Division
- Nathan Harber, JBLM DPW Master Planning Division
- Tom Knight, JBLM HQ, Chief of Staff
- Hal Nelson, DPTMS, Range Support
- John Norgren, JBLM HQ Public Affairs Office (PAO)
- Joe Piek, JBLM HQ PAO
- Eileen Rodriguez, 62nd Airlift Wing, Airfield Manager
- Stephanie Sparks, DPW Environmental Division (contractor)

#### **Elected and other City Officials**

- Don Anderson, City of Lakewood Mayor
- Shelly Badger, Yelm City Administrator
- John Caulfield, City of Lakewood City Manager
- Michael Grayum, City of DuPont Mayor

- Ron Harding, City of Yelm Mayor
- Ron Lucas, Town of Steilacoom Mayor
- Pat McCarthy, Pierce County Executive
- Dan Roach, Pierce County Council Chair
- Sandra Romero, Thurston County Commissioner, District 2
- Andy Ryder, City of Lacey Mayor
- Marilyn Strickland, City of Tacoma Mayor
- Karen Valenzuela, Thurston County Commissioner, District 3
- Cathy Wolfe, Thurston County Commissioner, District 1

#### **Agency Representatives**

- Rob Allen, Pierce County Economic Development Department
- Jeremy Davis, Thurston County Long Range Planning Division
- Kristiné Reeves, Washington State Department of Commerce

#### **Environmental Issues Subject Matter Experts**

- Hannah Anderson, Center for Natural Lands Management (CNLM)
- Patrick Dunn, CNLM
- Justin Hall, Nisqually River Foundation
- Lance Winecka, South Puget Sound Salmon Enhancement Group (SPSSEG)
- Heather Burgess, land use attorney representing property owners

#### **Tribes**

- Nisqually Indian Tribe

#### **Critical Takeaways**

Following are the most critical takeaways from the stakeholder and SME interviews, based on the comments raised by multiple interviewees or because of a qualitative statement of importance made by an interviewee.

- Cooperative efforts among multiple stakeholders (i.e., JBLM, local governments, other government agencies, nonprofits, and private landowners) will be critical for solving issues facing the region, including but not limited to habitat conservation and transportation.
- JBLM has done a good job of improving its communication with the community and has been a proactive partner for habitat conservation and other initiatives. It is vital that communication and partnerships are maintained and continually improved.
- The need for protection of prairie habitat for threatened and endangered species is the most important issue facing Thurston County right now.

Other comments are summarized by topic below.

#### **Stakeholder Recommendations**

- The JLUS process could help in formalizing public outreach and coordination among governments
- The JLUS could recommend that Lakewood follow Pierce County's process of notification for towers and development.

- More cooperation is needed. Protection/restoration of prairie species is not limited to ACUB Program efforts. Development also needs to be managed with threatened and endangered species in mind.

### **Military Airspace and Operations**

- Airspace capacity is constrained for both manned and unmanned military aircraft. Given the current airspace capacity, and the complex requirements of both civilian and military airspace, the scheduling of military flights is a challenge.
- Vegetation is lifting the fence on the east side of McChord Field, allowing animals in, especially deer, coyote, and rabbits. This poses a safety challenge to military flight operations.
- McChord Airfield has an active Bird/Wildlife Aircraft Strike Hazard (BASH) program to manage risks from conflicts between birds and wildlife and aircraft operations.
- As trees on properties adjacent or near to McChord Field grow taller, there is the potential for them to obstruct takeoff and landing operations. A survey and risk assessment, and ultimately trimming, may be required in both McChord Field clear zones.

### **Communications and Coordination**

- JBLM provides monthly community briefings to Lacey, Lakewood, Tacoma, and Sumner, as well as Military Affairs Committee briefings. A command representative provides annual updates to Chambers of Commerce and City Councils.
- JBLM PAO hosts a Facebook town hall every 6 months, largely attended by military spouses.
- Public education regarding habitat conservation efforts is important. People need to know that protection of threatened and endangered species benefits JBLM, which is a huge benefit to the regional economy.
- Pierce County, Tacoma, and Lakewood all give notice to JBLM of cell tower and development applications. JBLM provides comments and recommendations if these have the potential to obstruct aircraft operations or pose other safety hazards.
- Surrounding communities would benefit from advance knowledge about JBLM land use and capital facilities planning.
- The relationship between CNLM and JBLM's higher headquarters, Installation Management Command (IMCOM), offers room for improvement.
- Conservation efforts on JBLM would benefit from better integration and coordination with the training function at JBLM.
- The effort required by civilians to reach the appropriate JBLM staff member to address an issue is often arduous. Frequent leadership changes at JBLM add an additional challenge to coordination efforts.
- Homeowners associations should be included in outreach and coordination activities.
- Public schools in surrounding communities miss out on funding when military families fail to notify administration of their military status when registering students.
- People living near JBLM would benefit from better education about the military's mission and operations.

### **McChord Airfield North Clear Zone**

- The JLUS is viewed as a beneficial process for providing an outside look at zoning, particularly in the NCZ and APZs.
- McChord Field is currently operating with waivers to Clear Zone standards.
- McChord Air Field's NCZ is unique, being valuable industrial land, not farmland. With no alternative uses, the property's value is in its development potential. This increases the cost and difficulty of acquiring Clear Zone properties.
- Changes in REPI policies and funding levels have slowed the momentum to acquire properties in the Clear Zone.
- Without additional funding, few options are available for resolving the NCZ land use conflict.

### **Noise Impacts**

- Noise issues that arose from changing helicopter operations were quickly resolved.
- Military flight patterns are designed in part to diminish noise impacts on surrounding communities.
- JBLM PAO generally provides 1–2 weeks advance notice of activities to a standing list that includes the Olympian, Nisqually Valley News and Suburban Times newspapers, the offices of mayors in surrounding cities, and 911 dispatch centers.
- The threshold for public notification of potentially noise-generating military activities is large-impact activities (e.g., howitzers, range clearance, "Osprey" aircraft deployments), not small explosives, mortars, or small arms.
- Sustained artillery fire and sustained training at night generate the most complaints. Ammunition less than 120mm does not.
- Noise complaints to the JBLM PAO mostly come from communities to the south and east, which are closer to major training areas: Roy, Yelm, Lacey, and Olympia.
- The Joint Base Commander must approve any noise-generating activities planned to occur between 11:00 pm and 7:00 am. Fortunately, the sun sets early for many months, so required night training can often be concluded before 11:00 pm.
- JBLM will likely conduct more smaller unit training in the foreseeable future. However, shrinking military budgets may mean that more large-scale training exercises will occur at JBLM to avoid the costs of transporting troops and equipment to Yakima.

### **Off-base Community**

- 9,000 military personnel will be separating from active duty in the next couple of years. In 2013, one-third of those separating stayed in Washington State.
- 32,064 military retirees currently live within 40 miles of JBLM and use the installation for services.
- Workforce development activities at JBLM assist with those transitioning to the private sector. Efforts also include building partnerships with other service providers and industries needing skills sets that military personnel have, such as law enforcement, security, construction, aerospace manufacturing, and cyber-security.
- JBLM duty officers embed with Lakewood and Tacoma police departments on Friday and Saturday as part of a mutual aid agreement.
- JBLM and surrounding communities would benefit through coordinated planning of utility services, emergency management, and community facilities, such as libraries,

pools, veteran services, community centers, sports fields, etc.

### **Threatened and Endangered Species and Habitat**

- The biggest environmental issue facing Thurston County is protecting the thousands of acres of prairie habitat inhabited by the listed gopher species.
- Endangered species listings are affecting the base and surrounding properties.
- The pocket gopher listing will most directly impact private landowners.
- Listed species are a potential threat to training readiness at JBLM, if not managed effectively.
- Challenges to listed-species recovery efforts include habitat fragmentation, lack of consistent funding, and finding landowners who are willing sellers.
- Successful conservation efforts benefit all landowners as well as JBLM.
- The ACUB program is a partnership formed to address encroachment issues. Partners include JBLM, WDFW, WDNR, Department of Corrections, private partners, and non-profits.
- ACUB funds the Sentinel Landscapes pilot program. Activities on lands that JBLM currently has under ACUB/Sentinel Landscapes focus on restoration, bringing back native prairie elements, reintroducing prescribed fire, incorporating specific habitat structure and plants for butterflies, and the reintroduction of species.
- Bald eagle nests in the vicinity of JBLM, particularly along the Nisqually River, are very productive due to restrictions during their breeding season and predators being scared off by noise in the surrounding area.
- Environmental groups have a positive relationship with JBLM in working toward preservation of habitat.
- CNLM is currently developing BMPs for preserving habitat on agricultural lands.
- Preventing agricultural land from conversion to urban development helps preserve gopher habitat as ranchers typically provide good habitat stewardship. For example, with proper rotation, livestock grazing can rejuvenate soil to the benefit of gophers and butterflies.
- The Thurston County Habitat Conservation Plan (HCP), being developed in consultation with the USFWS, kicked-off in July 2014. A draft plan targeting 14–15 species is anticipated in early 2015.
- Thurston County is developing a prairie habitat assessment methodology that will include a credit/debit system to identify mitigation requirements for development proposals. It will not be finalized until the HCP is complete.
- Thurston County has a conservation futures fund, funded through excise taxes on real estate, that provides funds to acquire property with critical habitat. Funds are used in partnership with the Capitol Land Trust, Nisqually Land Trust, and CNLM. However, these funds cannot be used for maintenance of acquired lands.
- There is an opportunity to make use of existing public lands not currently considered as habitat for listed species (e.g., Fort Steilacoom Park, historically a native prairie).
- Sequelitchew Creek, with headwaters on JBLM, has a watershed restoration plan stemming from a settlement agreement related to the expansion (in 2007) of the Cal Portland mine in DuPont. Beaver dams and shallow wells reduce flow and stormwater contaminate the creek, compromising habitat for migrating salmon. Beaver management, deeper wells, and replacing culverts with weirs can all improve



the situation. For these activities to be effective, active participation is required by many entities: JBLM, DuPont, Ecology, Pierce County, Cal Portland, and the SPSSEG.

- Reed canary grass in Maury Creek (near McChord Field) restricts its water flow.
- Restoration efforts can sometimes be complicated by regulations. For example, the DuPont CAO prohibits certain modifications of waterways that would assist with restoration activities. Permitting requirements, such as habitat protection areas (HPAs), present additional challenges.
- The need for regulatory certainty is part of the species and habitat challenge.

#### **Training Land**

- Daily range use is prioritized for military activities; then environmental needs; scheduled family Morale, Welfare, and Recreation (MWR) activities; and lastly unscheduled MWR activities. A recorded message identifies which areas are open.
- Compatible public activities are authorized on military lands. Incompatible activities, like rifle hunting, have to be scheduled to avoid conflicts.
- The habitat protection for listed species may require the closure of more popular recreation areas.
- Though artillery impact areas are not fenced off, signs effectively discourage trespassing — not many people wander into impact areas. Outside of impact areas, a lot of unauthorized use occurs on training lands. The most prevalent trespassers on JBLM training lands are people dumping garbage and people participating in recreational activities that are either prohibited outright, or that have not been granted conditional approval by JBLM.

#### **Transportation**

- Traffic is a major concern on and off base. Population off base continues to grow.
- Off-base issues generally involve the I-5 corridor, with most focused on congestion during commuting hours.
- The I-5 corridor work may affect JBLM property, depending on the selected option. It may also impact the historic building currently housing the Family Resource Center on JBLM.
- DoD is bringing more activities on base to reduce off-base traffic associated with JBLM.
- The Point Defiance rail bypass proposal would dramatically increase rail traffic through the region, could have a significant impact on overall mobility in the area, and may affect rail operations on JBLM.
- A dedicated shuttle or transit system from local communities onto JBLM may help reduce congestion.
- Traffic complaints to the JBLM PAO mostly come from DuPont, Lakewood, Tacoma, and Lacey.

#### **Urban Growth**

- Development pressure in Thurston County presents a long-term challenge, as many military retirees choose to stay in the county while species and habitat restoration programs limit development.
- Land use in unincorporated Thurston County near the base is zoned for rural residential at one home per 1–5 acres, or zoned for agriculture. Rezoning to a lower

density (downzoning) would be considered if best available science showed doing so would produce some environmental benefit, but currently that is not the case.

- An ongoing lawsuit through the Growth Management Hearings Board contends that Thurston County zoning has too much density.
- I-5 improvements could stimulate more development, which may exacerbate current issues.

## **9.2. Community Participation**

The SSMCP hosted its first round of three public meetings about the JBLM JLUS in late June 2014. A project website was also launched prior to the public open houses to provide information and gather comments. The following points are a summary of comments from those sources.

### **Transportation**

- Congestion and increased travel times on the I-5 corridor affect everyone in the region and heavily impact local economies. A cross-base highway could alleviate some of the congestion but could also funnel even more traffic to I-5. Several participants oppose the cross-base highway because of environmental or base security reasons.
- Many members of the public would like to see a balanced transportation approach that incorporates an improved transit system (though they acknowledge the challenges of a currently dispersed ridership). More connectivity between cities along the corridor may help to stimulate a higher demand.

### **Growth around the Joint Base**

- JBLM benefits the local economy by improving the regional tax base and providing job opportunities, including those for military spouses and families.
- Commercial development on base needs to be balanced in such a way that community businesses off base are not harmed.
- New development should be of high quality so as to improve quality of life for residents in the surrounding communities. Too much development that could change the small town feel of DuPont was a concern.
- Growth should not be allowed to compromise the natural beauty benefits of the area or the revenue generated from environmental tourism.
- Opportunities for partnerships between the base and surrounding communities to collaborate on recreation and social service facilities should be explored.

### **Environmental Issues**

- In general, participants believe the base is currently doing a good job of being a responsible environmental steward.
- It is essential to preserve critical areas both on and off the base, with emphasis placed on coordination between cities, counties, and the base. Environmental issues, however, need to be balanced with the military mission.
- More effective methods are needed to mitigate surface water runoff that contains contaminants coming from traffic on I-5 and jet fuel emissions, and to address the issue of water availability in the Yelm UGA.
- Garry oak habitat, which does not have a federal endangered species act designation, was not shown on the meeting exhibits; however, this habitat is considered sensitive by the

State of Washington, and the JLUS should address impacts on this habitat.

#### **Off-Base Impacts**

- Most attendees stated their opinion that, when people move near a base, they need to acknowledge that impacts come with that decision. Most participants said they are willing to live with the impacts because of the need for military training and readiness; however, real estate disclosures of potential impacts on nearby properties should be required.
- Most said the noise from explosions and helicopters is tolerable. To some, the sound of military helicopters means active training and equates to protection. Most also give credit to the base for following the flight plans and guidelines that limit impacts on the surrounding communities. Others are unclear as to why helicopters are flown down I-5 or need to travel over adjacent civilian property, given that helicopters do not require the large turning radius that airplanes do.
- The McChord Field NCZ presents mixed challenges. Many believe there should be no development near McChord in order to preserve the functions of the base and protect civilians from potential accidents. However, some current business owners in the McChord Field NCZ would like to stay where they are as it is a good location for their business. Some have also experienced financial challenges when trying to sell property in the NCZ because of the location.

#### **Other Topics**

- Recreational access to the range was of particular interest to the Back Country Horsemen. Past trail riding opportunities to preferred areas were closed in 2012 due to increased helicopter use of the training area. Access for general recreation, hunting, and firewood gathering was also of interest, and recommendations were made for improving the relationship.
- There is interest in advance knowledge about growth fluctuations at the base to enable surrounding communities to better plan for changes.
- Two way communication between the base and communities was viewed as important and ensures that cities and counties feel heard.
- The SSMCP was noted for doing a good job facilitating communication and coordination of communities surrounding the base.
- Quality social and health services were viewed as critical to have within the community, and concern was expressed that health services are not keeping pace with current demand.

