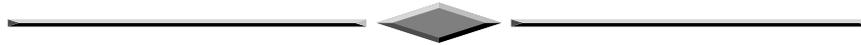


APPENDIX G

LAND USE AND LAND MANAGEMENT



Appendix G

Land Use

Introduction

The Proposed Action area, which includes the footprint of the existing and proposed airspace, encompasses large areas of the State of Oregon as well as small areas above the State of Washington and Nevada. Land use types and visual resources below the existing and proposed airspace are varied and included urbanized regions, rural farmland and timberlands, and remote and virtually unaltered open spaces that provide recreational opportunities and wildlife protection. Due to the large footprint of the Proposed Action area the Environmental Impact Statement (EIS) describes land use and visual resources at a regional overview level. This appendix provides additional information regarding specific land uses beneath the Proposed Action areas – including a description of county-level socioeconomic demographics as well as identification of state parks, national forests, national parks, national wildlife refuges, wild and scenic rivers, and tribal lands as well as other local, state, and federal land use types. This appendix also describes National Historic Trails, Wilderness Study Areas, and Lands with Wilderness Characteristics located beneath the existing and proposed airspace. Further, this appendix provides additional information regarding planning entities and regulations applicable to land uses and visual resources below the Proposed Action area.

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APPENDIX G LAND USE AND LAND MANAGEMENT

The following provides a detailed description of available land use and land management information for public and private lands beneath the affected and proposed airspaces.

Land use and management decisions occur at the local level within county and city governments, state level for State Parks and State Forests, and at the federal level for National Forests, National Parks, National Wildlife Refuges (NWRs), Wilderness Areas, Wilderness Study Areas (WSAs), Lands with Wilderness Characteristics (LWCs) Wild and Scenic Rivers, National Historic Trail, Areas of Critical Environmental Concern (ACEC), Marine Protected Areas (MPAs), and Research Natural Areas (RNAs).

- *National Forests* are federal lands administered by the U.S. Department of Agriculture – Forest Service (USFS) that largely consist of forested and woodland areas that are used both for recreation and natural resources extraction.
- *National Wildlife Refuge* is a designation for protected areas managed by the U.S. Fish and Wildlife Service (USFWS) for the conservation of sensitive or unique populations of fish, wildlife, and vegetation.
- *Wilderness Areas* were established under the Wilderness Act, which created the National Wilderness Preservation System and recognized wilderness as “an area where the earth and its community of life are untrammled by man, where man himself is a visitor who does not remain.” Designated wilderness is the highest level of conservation protection for federal lands. Only Congress may designate wilderness or change the status of wilderness areas. Wilderness areas are designated within existing federal public land. Congress has directed four federal land management agencies—USFS, Bureau of Land Management (BLM), USFWS, and National Park Service (NPS)—to manage wilderness areas so as to preserve and, where possible, to restore their wilderness character.

- *Wilderness Study Areas* contain undeveloped U.S. federal land retaining its primeval character and influence, without permanent improvements or human habitation, and managed to preserve its natural conditions.
- *Lands with Wilderness Characteristics* can generally be defined as unroaded BLM public land areas greater than 5,000 acres in size that have maintained their primitive character and are primarily undeveloped
- *Wild and Scenic Rivers* are designated protected rivers or river segments under the National Wild and Scenic Rivers Act. A river or river segment may be designated for protection as a wild and scenic river by the U.S. Congress or the Secretary of the Interior.
- *National Historic Trails* are a network of scenic, historic, and recreation trails created by the National Trails System Act of 1968. These trails provide for outdoor recreation needs, promote the enjoyment, appreciation, and preservation of open-air, outdoor areas and historic resources, and encourage public access and citizen involvement.
- *Areas of Critical Environmental Concern* are public lands managed by the BLM that require special management in order to protect the area's resource values. The resources may be wildlife habitat, special viewsheds, or, areas of cultural or historical importance. The ACEC may also require special management due to hazards.
- *Marine Protected Areas* are designated ocean areas that are set aside by state or national authority for a variety of conservation and management methods. Protected areas may be established to protect ecosystems, preserve cultural resources, aid in marine or coastal research, or sustain fisheries production (National Oceanic and Atmospheric Association [NOAA] 2013).
- *Research Natural Areas* are reserved areas, which contain important ecological and scientific values and are managed for minimum human disturbance. The goals of RNAs are to preserve examples of all significant natural ecosystems for comparison with those influenced by man; to

provide educational and research areas for ecological and environmental studies; and to preserve gene pools of typical and endangered plants and animals (BLM 2007a).

Additionally, affected and proposed airspace occurs over areas of tribal lands, where local land use decisions regarding management and allowable activities are made and enforced by tribal governments. This section provides an overview of the land use and management beneath the proposed areas of airspace modification.

REGIONAL SETTING

The majority of proposed airspace actions are located within the State of Oregon. However, the proposed expansion of the Juniper/Hart Military MOA Complex would include airspace over portions of Humboldt and Washoe counties in northwestern Nevada. Additionally, modifications to the Eel ATCAA would include airspace over a small portion of Pacific County in Washington and modification to W-570 and the Bass/Bass South ATCAAs would occur over the Pacific Ocean. Land uses below the airspace are varied and include urbanized regions (e.g., Astoria, Condon, Frenchglen, etc.), rural farmland and timberlands, and remote and virtually unaltered open spaces that provide recreational opportunities and wildlife protection. The Great Basin Desert occupies the southeastern third of Oregon, with the predominant land use consisting of farmland and National Forest lands. The western half of the state is predominately forestland, with land uses consisting primarily of private timberlands, National Forest, and pockets of urban areas.

NATIONAL HISTORIC TRAILS

The National Trails System is the network of scenic, historic, and recreational trails created by the National Trails System Act of 1968. These trails provide for outdoor recreation needs, promote the enjoyment, appreciation, and preservation of open-air, outdoor areas and historic resources, and encourage public access and citizen involvement.

National Historic Trails are designated to protect the remains of significant overland or water routes to reflect the history of the nation. Most of these trails are scenic highway routes and are not specifically established or maintained as hiking trails, though they may provide opportunities for hiking and other outdoor activities along their routes.

The proposed and affected airspace included in the Proposed Action overlies or is in close proximity to a number of segments of the California Historic Trail, Oregon Historic Trail, and the Lewis and Clark Historic Trail.

California Historic Trail

The California Historic Trail was an emigrant trail spanning approximately 2,000 miles across the western half of North America from the Missouri River to the State of California. After it was established, the first half of the California Trail followed the same corridor of networked river valley trails as the Oregon Trail and the Mormon Trail, namely the valleys of the Platte, North Platte, and Sweetwater Rivers to Wyoming. In the States of Wyoming, Idaho, and Utah the California and Oregon trails split into several different trails or cutoffs. Once in western Nevada and eastern California, the pioneers worked out several paths over the rugged Carson Range and Sierra Nevada mountains into the gold fields, settlements, and cities of Northern California. The main routes initially (1846–1848) being the Truckee Trail to the Sacramento Valley and after about 1849 the Carson Trail route to the American River and the Placerville, California gold digging region.

Oregon National Historic Trail

The Oregon Trail is an approximately 2,200-mile historic east–west large-wheeled wagon route and emigrant trail that connected the Missouri River to valleys in Oregon. The eastern part of the Oregon Trail spanned part of the State of Kansas and nearly all of the States of Nebraska and Wyoming. The western half of the trail spanned most of the States of Idaho and Oregon.

The Oregon Trail was laid by fur trappers and traders from about 1811 to 1840 and was only passable on foot or by horseback. By 1836, when the first migrant wagon

train was organized in Independence, Missouri, a wagon trail had been cleared to Fort Hall, Idaho. Wagon trails were cleared further and further west, eventually reaching all the way to the Willamette Valley in Oregon. What came to be called the Oregon Trail was complete, even as improved roads, cutoffs, ferries and bridges made the trip faster and safer almost every year. From various starting points in Missouri, Iowa or Nebraska Territory, the routes converged along the lower Platte River Valley near Fort Kearny, Nebraska Territory and led to rich farmlands west of the Rocky Mountains.

From the early to mid-1830s the Oregon Trail and its many offshoots were used by about 400,000 settlers, ranchers, farmers, miners, and businessmen and their families. The eastern half of the trail was also used by travelers on the California Trail before turning off to their separate destination. Use of the trail declined as the first transcontinental railroad was completed in 1869, making the trip west substantially faster, cheaper, and safer. Today, modern highways such as Interstate 80 and Interstate 84 follow parts of the same course westward and pass through towns originally established to serve those using the Oregon Trail.

National Park Service Feasibility Study

The NPS is preparing a feasibility study to evaluate some 64 routes for possible additions to the Oregon and California National Historic Trails, among others. This study was authorized by Congress – in response to years of sustained public interest – under the Omnibus Public Land Management Act of 2009.

The 10 Oregon Trail study routes listed in the Act are:

- Naches Pass Trail in Washington
- Cowlitz River Route in Washington
- Whitman Mission Route in Oregon and Washington
- Upper Columbia River Route in Oregon and Washington
- Meek Cutoff in Oregon

- Free Emigrant Road in Oregon
- Cutoff to Barlow Road in Oregon
- North Alternate Oregon Trail in Idaho
- Goodale's Cutoff in Idaho
- North Side Alternate in Idaho

Also listed in the Act are seven routes that are already designated segments of the California National Historic Trail. This study will determine whether they should be designated as Oregon National Historic Trail as well. They are:

- St. Joe Road in Missouri and Kansas
- Council Bluffs Road in Iowa and Nebraska
- Old Fort Kearny Road (Oxbow Trail) in Nebraska
- Raft River to Applegate in Idaho, Utah and Nevada
- Sublette Cutoff in Wyoming
- Applegate Route in Nevada, California, and Oregon
- Childs Cutoff in Wyoming

Lewis and Clark Historic Trail

The Lewis and Clark National Historic Trail is a route across the U.S. commemorating the Lewis and Clark Expedition of 1804 to 1806. It is part of the National Trails System of the U.S., extending for approximately 3,700 miles from Wood River, Illinois, to the mouth of the Columbia River in Oregon.

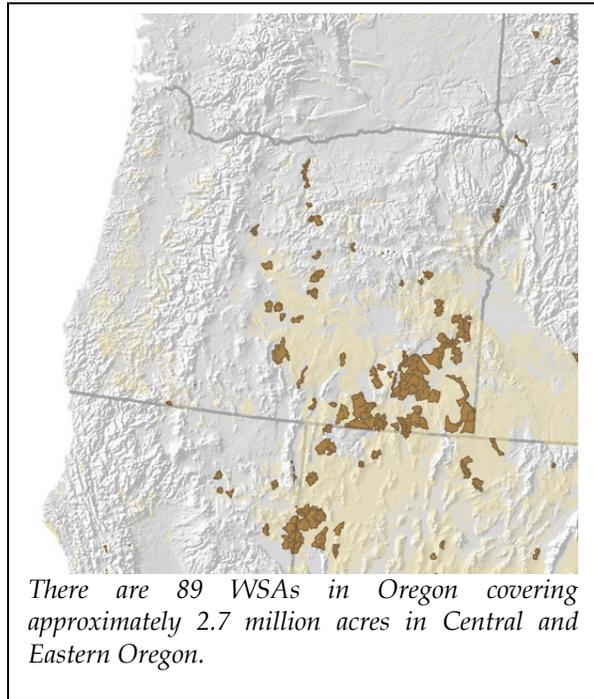
The trail is administered by the NPS, but sites along the trail are managed by federal land management agencies, state, local, tribal, and private organizations. The trail is not a hiking trail, but provides opportunities for hiking, boating and horseback riding at many locations along the route. The trail is the second longest

of the 23 National Scenic and National Historic Trails. Beginning at the Camp Dubois recreation in Illinois, it passes through portions of Missouri, Kansas, Iowa, Nebraska, South Dakota, North Dakota, Montana, Idaho, Oregon, and Washington.

WILDERNESS STUDY AREAS

The BLM manages 517 WSAs containing approximately 12.6 million acres located in the Western States and Alaska. The Federal Land Policy and Management Act of 1976 (FLPMA) directed the BLM to inventory and study its roadless areas for wilderness characteristics. To be designated as a WSA, an area must have the following characteristics:

- Size - Roadless areas of at least 5,000 acres of public lands or of a manageable size;
- Naturalness - Generally appears to have been affected primarily by the forces of nature; and
- Opportunities - Provides outstanding opportunities for solitude or primitive and unconfined types of recreation.



In addition, WSA often have special qualities such as ecological, geological, educational, historical, scientific and scenic values. The congressionally directed inventory and study of BLM's roadless areas received extensive public input and participation. By November 1980, the BLM had completed field inventories and designated about 25 million acres of WSAs. Since 1980, Congress has reviewed some of these areas and has designated some as wilderness and released others for non-wilderness uses. Until Congress makes a final

determination on a WSA, the BLM manages these areas to preserve their suitability for designation as wilderness.

There are 89 WSAs in Oregon covering approximately 2.7 million acres. There are no WSAs underlying the proposed Eel MOA Complex; however, a number of WSAs occur beneath the proposed Redhawk MOA Complex, including the Redhawk A MOA and Redhawk C MOA. WSAs also occur beneath the proposed the Juniper/Hart MOA Complex, including beneath the proposed Juniper East Low MOA; however, no WSAs occur beneath the Juniper C MOA or the Hart F MOA.

LANDS WITH WILDERNESS CHARACTERISTICS

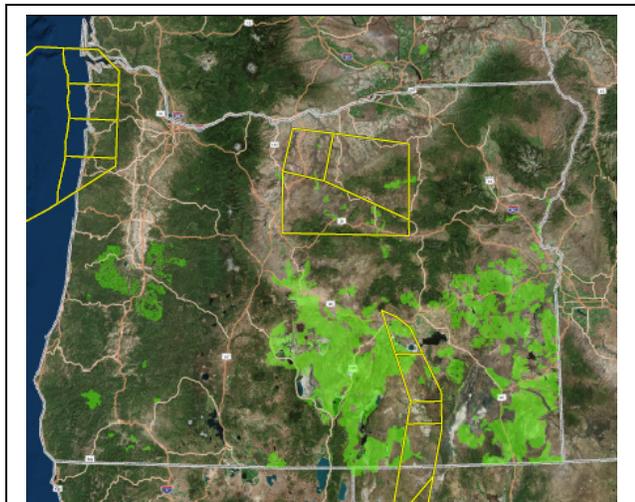
The BLM is required to maintain inventories of LWCs. LWCs provide a range of uses and benefits in addition to their value as settings for solitude or primitive and unconfined recreation. Section 201 of the FLPMA requires the BLM to maintain an inventory of all public lands and their resources and other values, including wilderness characteristics. It also provides that the preparation and maintenance of the inventory shall not, of itself, change or prevent change of the management or use of public lands. The BLM conducts the inventory process using the criteria from Section 2(c) of the Wilderness Act to determine the presence of wilderness characteristics, such as:

- Size – The roadless area has at least 5,000 acres of contiguous public lands (or is of sufficient size to make practicable the preservation and use in an unimpaired condition);
- Naturalness – The area generally appears to have been affected primarily by the forces of nature, with any human imprints being substantially unnoticeable;
- Outstanding opportunities – The area provides outstanding opportunities for solitude or a primitive and unconfined type of recreation; and
- Supplemental values – The area may also contain ecological, geological, or other features of scientific, educational, scenic or historical value.

In 2013, the BLM completed its Lands with Wilderness Characteristics Inventory (LWCI) updates for western Oregon:

- No areas were found to meet the minimum criteria for having wilderness characteristics on the Eugene District, Klamath Falls Resource Area of the Lakeview District, or Roseburg District
- The Coos Bay District inventory found one area that possesses wilderness characteristics totaling 3,048 acres.
- The Medford District inventory found seven areas that possess wilderness characteristics totaling 85,254 acres, including Berry Creek, Burton Nine Mile, Dakubetede, Round Top Mountain, Wellington, Whiskey Creek, and Wild Rouge. The remaining areas examined in detail were found to lack wilderness characteristics for a variety of reasons.
- The Salem District inventory found four areas, including a total of nine subunits, that possess wilderness characteristics, resulting in a total of 2,624 acres including Table Rock, Opal Creek Evans Mountain, Opal Creek Nasty Rock, and South Fork Clackamas. All areas rely on adjacent BLM wilderness or other federal lands with wilderness characteristics to meet the size criterion.

Inventory updates are also underway in the Vale District for the Malheur and Jordan Resource Areas as well as the Baker Resource Area. A complete list of LWCs in Oregon can be found in Wilderness Review Intensive Inventory (1980) prepared by the BLM. No LWCs occur beneath the existing Eel ATCAA. LWCs are sparsely distributed beneath the proposed Redhawk MOA Complex, and densely distributed beneath the



LWCs are distributed throughout the State of Oregon; however, the majority occur in the southeastern region of the state.

existing and proposed areas of the Juniper/Hart MOA Complex, including the proposed Juniper East Low MOA.

EEL ATCAA AND W-570 AIRSPACE

Local Land Use Management

The Eel ATCAA is located over portions of Clatsop, Tillamook, Yamhill, Polk, and Lincoln counties in coastal Oregon as well as a small inclusion over Pacific County in Washington. The W-570 airspace is located entirely offshore over the Pacific Ocean. Northwestern Oregon and southwestern Washington are predominately characterized by forestland, which extends from the rocky coastline into coastal foothills and the mountainous Coast Range. Land uses in this region consist primarily of private timberlands, federal and state-owned lands, and pockets of urban areas. Private land use and management underlying the Eel ATCAA are predominantly governed at the local level by county and city governments. However, state agencies also manage substantial areas underlying the airspace, including 38 State Parks and two State Forests. Federally managed lands underlying the existing and proposed airspace include one National Forest, five NWRs, Areas of Critical Environmental Concern (ACEC) and one National Historic Park. No Wild and Scenic Rivers occur within these areas.

Local Land Use and Management

Under the Proposed Action Eel MOA A-D would be established beneath the existing Eel ATCAA over coastal Oregon above the counties of Clatsop, Tillamook, Yamhill, Polk, and Lincoln in Oregon, and Pacific County in Washington. These counties are predominantly rural, containing a few pockets of urban areas and numerous unincorporated communities. Incorporated cities tend to control local land use decisions; whereas land use in and around unincorporated communities are often made at the county government level. Population density and incorporated and unincorporated areas are provided in Table G-1.

Table G-1. Population and Urban Areas beneath Eel ATCAA and W-570

Location	Area Square Miles	Population per Square Mile	Incorporated Cities	Unincorporated Communities
Clatsop Co., OR	1,085	41	5	35
Tillamook Co., OR	1,333	23	7	33
Yamhill Co., OR	718	139	10	24
Polk Co., OR	741	102	17	24
Lincoln Co., OR	1,194	47	7	27
Pacific Co., WA	1,224	22	10	14

Source: U.S. Census Bureau 2010.

Clatsop County

Clatsop County encompasses 1,085 square miles, including 180 square miles of Pacific Ocean and freshwater. The population of Clatsop County is 37,039 people (U.S. Census Bureau 2010). The population density is approximately 41 people per square mile, with most urban development located along the coast.¹ Inland areas are primarily rural and densely forested. The county contains five incorporated cities (Astoria, Cannon Beach, Gearhart, Seaside, and Warrenton) and 35 unincorporated communities.

The confluence of the Columbia River with the Pacific Ocean supports a world-renowned fishery that enables a healthy local marine services industry that includes worldwide shipping, boat construction, repair and maintenance. Just inland, dense temperate rain forest environments provide important habitat and recreational opportunities as well as resource extraction (i.e., logging). Logging occurs in areas that are set back from water features and provides substantial employment. The natural beauty and natural resources drive tourism, recreation, and resource-based industries, which are primary economic drivers in the county.

Land ownership in the county is primarily private; however, substantial areas of publicly owned lands also occur. In particular, Clatsop (154,000 acres) and

¹ As a point of reference, the population densities for the cities of Portland and Salem are approximately 4,376 persons per square mile and 3,229 persons per square mile, respectively (U.S. Census Bureau 2010).

Tillamook State Forests (364,000 acres) comprise a substantial portion of the eastern and southern part of the county, respectively.

Tillamook County

Tillamook County is a coastal county that encompasses 1,333 square miles, including 231 square miles of Pacific Ocean and freshwater. The population of Tillamook County is 25,250 (U.S. Census Bureau 2010). The population density is approximately 23 people per square mile, with the majority of urban development located along the coast. Similar to Clatsop County, inland areas are primarily rural and densely forested. The county contains seven incorporated cities (Bay City, Garibaldi, Manzanita, Nehalem, Rockaway Beach, Tillamook, and Wheeler) and 33 unincorporated communities.

Urban development is concentrated near Tillamook Bay in the City of Tillamook in the northern part of the county as well as in Pacific City in the southern part of the county. Primary industries that drive land use include agriculture, timber harvest, tourism, and fishing. Dairy farming is a major industry in the county, along with timber harvest. Approximately 44 percent of the county is under state ownership, primarily within Tillamook State Forest.

Yamhill County

Yamhill County encompasses 718 square miles including 2.8 square miles of freshwater located the Willamette Valley region. The population of Yamhill County is 99,193 (U.S. Census Bureau 2010). The population density is approximately 139 people per square mile. The county contains ten incorporated cities and 24 unincorporated communities.

The major industries of the county are agriculture, forest products, manufacturing, and education. Timber is Yamhill County's number one basic export, with approximately one third of the county consisting of state and privately owned commercial timber holdings (Yamhill County 1996). Substantial agricultural operations also occur, including wheat, barley, horticulture, and dairy farming. Additionally, Yamhill County contains substantial grape wine cultivation, with over 80 wineries and 200 vineyards located within the county. Urban development

is greater in the eastern half of the county in McMinnville, Carlton, Newberg, and Sheridan in the southern part of the county. Forest dominates the western half of the county.

Land area affiliated with the Confederate Tribes of Grand Ronde Community is located in the southwestern part of the county.

Polk County

Polk County encompasses approximately 741 square miles located the Willamette Valley region. The population of Polk County is 76,353 (U.S. Census Bureau 2010). The population density is approximately 102 people per square mile. The county contains 17 incorporated cities and 24 unincorporated communities.

Land area affiliated with the Confederate Tribes of Grand Ronde Community is located in the northwestern part of the county.

Lincoln County

Lincoln County is a coastal county that encompasses 1,194 square miles, including 214 square miles of Pacific Ocean and freshwater. The population of Lincoln County is 46,034 (U.S. Census Bureau 2010). The population density is approximately 47 people per square mile. The county contains seven incorporated cities and 27 unincorporated communities. Urban development is concentrated along the coast in Lincoln County. Major cities include Lincoln City, Newport, and Toledo. Inland areas of Lincoln County are forested.

Land area affiliated with the Confederated Tribes of the Siletz Indians is located in the northeastern part of the county.

Pacific County

Pacific County is the southernmost coastal county in Washington and encompasses 1,224 square miles, including 291 square miles of Pacific Ocean and freshwater. The population of Pacific County is 20,930 (U.S. Census Bureau 2010). The population density is approximately 22 people per square mile. The county

contains ten incorporated cities and 14 unincorporated communities. Urban development in Pacific County, Washington is concentrated on the Long Beach Peninsula and along the Willapa River. Inland Pacific County is forested and logging is a prominent land use.

The Shoalwater Bay Tribe has land located on the north shore of Willapa Bay, to the north of the proposed Eel MOA/ATCAA Complex.

State Land Use and Management

Areas managed by the State of Oregon include state forests and state parks. State and federally owned and managed areas are multi-use, with recreation often a primary component of land use management.

State Forests

State forest lands comprise a significant percentage of public forest lands in northwest Oregon and provide important timberlands as well as a wide variety of recreational opportunities for local residents and visitors. The *Northwest Oregon State Forests Management Plan* provides management direction for over 615,000 acres of state forest land, located in twelve northwest Oregon counties (Oregon Department of Forestry 2010). State forests that occur beneath the Eel airspace include portions of the Clatsop and Tillamook State Forests. The majority of state forest lands in northwestern Oregon are owned and managed by the Board of Forestry and managed in accordance with the *Northwestern Oregon State Forests Management Plan*. This plan takes a comprehensive, multi-resource approach to forest management and includes a description of each forest resource, and information about current management programs for these resources. The resource management goals and strategies are intended to achieve a proper land use balance among the resources and achieve the greatest permanent value through a system of integrated management (Oregon Department of Forestry 2010).

Recreational use of the state forest lands primarily occur dispersed along roads, rivers, and streams. Recreational activities include hunting, target shooting, fishing, dispersed or campground camping, and off-highway vehicle use. Other

uses are hiking, horseback riding, mountain biking, and scenic viewing (at viewpoints). Hunting use is concentrated in the fall deer and elk seasons, beginning with the opening of bow season in late August (Oregon Department of Forestry 2010).

Tillamook State Forest is comprised of approximately 364,000 acres of forest land. Prior to 1933 the land within Tillamook State Forest was almost entirely privately owned. After a series of severe wildfires in the 1930s, known as the Tillamook Burn, many landowners allowed the forestlands to be foreclosed by the counties rather than pay taxes. Counties began to deed land in the Tillamook Burn to the Board of Forestry in 1940, and about 255,000 acres eventually came under state ownership.² In June 1973, the former Tillamook Burn was dedicated as the new Tillamook State Forest. The 364,000 acre forest includes 255,000 acres from the Tillamook Burn, and other unburned forest land. Tillamook State Forest contains an extensive trail network that provides recreational opportunities for hiking, horseback riding, mountain bike riding, and OHV use. There are ten designated campgrounds in the forest.

Clatsop State Forest is 98 percent controlled by Board of Forestry Lands with the remaining two (2) percent of the Clatsop State Forest is Common School Fund Land. These lands were privately owned, logged between 1910 and 1940, and then became tax-delinquent. Clatsop and Columbia Counties foreclosed when landowners could not pay their taxes, and ownership reverted to the county. Many landowners filed for bankruptcy and lost their land during the Great Depression. Eventually, the counties deeded these cutover and unmanaged forest lands to the Board of Forestry to manage as a state forest. According to the agreement, the Department of Forestry would replant the lands, protect them from fire, and manage the new forest. Then, as timber was harvested, the counties would receive two-thirds of the net revenue.

State Parks

Oregon State Parks are managed and maintained by the Oregon Parks and Recreation Department. Management is focused on providing for multiple uses

² Most of the remaining 100,000 acres is owned by private timber companies and BLM.

including recreation, education, and conservation. The mission of the Parks and Recreation Department is to provide and protect outstanding natural, scenic, cultural, historic and recreational sites for the enjoyment and education of present and future generations. State Parks are governed primarily by regulations and policies contained within the individual State Park plans (i.e., *Tillamook County Coastal State Parks Master Plan*). There are 72 State Parks located below the Eel airspace, which are listed below:

- Fort Stevens SP
- Del Rey Beach SP
- Arcadia Beach SP
- Ecola SP
- Tolovana Beach SP
- Gleneden Beach SP
- Boiler Bay SP
- Cape Kiwanda SP
- Fogarty Creek SP
- Bradley SP
- Saddle Mountain SP
- Nehalem Bay SP
- Vermonia SP
- Lewis and Clark Historical SP
- Rocky Creek SP
- Twin Rocks SP
- Elmer Feldenheimer SP
- Otter Crest SP
- Hug Point SP
- Devil's Punchbowl SP
- Oswald West SP
- Bald Peak SP
- Cape Lookout SP
- Beverly Beach SP
- Erratic Rock SP
- Robert Straub SP
- Agate Beach SP
- Champoeg SP
- Manhattan Beach SP
- Yaquina Bay SP
- Roads End SP
- Maud Williamson SP
- South Beach SP
- Ona Beach SP
- Neskowin Beach SP
- Lost Creek SP
- Beachside SP
- Governor Patterson Memorial SP
- Driftwood Beach SP
- Smelt Sands SP
- Yachats Ocean Road SP
- Cape Meares SP
- Ellmaker SP
- William B. Nelson Devil's Lake SP
- Tillicum Beach SP
- Seal Rock SP
- Oceanside Beach SP
- Grayland Beach SP
- Yachats SP
- Neahkahnie-Manzanita SP
- Haystack Hill SP
- Pacific Pines SP

- H.B. Van Duzer Forest SP
- Cougar Valley SP
- Roads End SP
- Leadbetter Point SP
- Gleneden Beach SP
- Fishing Rock SP
- Depoe Bay Whale Watch Center SP
- Sunset Beach SP
- D River SP
- Oceanside Beach SP
- Gearhart Ocean SP
- Symons SP
- Rockaway Beach SP
- Sunset Highway SP
- Sand Lake SP
- Clay Myers SP
- Munson Creek SP
- Devil's Lake SP
- Cape Disappointment SP
- Fort Columbia SP

Federal Land Use and Management

Federal lands below the existing and proposed airspace modifications include lands managed by the USFS, the USFWS, the National Park Service, the BLM, and the National Marine Fisheries Service (NMFS), as discussed below.

National Forests

The USFS manages lands for multiple use and sustained yields of various products and services, for example, timber harvesting, recreation, grazing, watershed protection, and fish and wildlife habitats. Most of USFS lands are designated national forests, but there are also national grasslands and other lands. Portions of one national forest occur beneath the Eel MOA.

Siuslaw National Forest extends along the Central Oregon coast and east into the Coast Range Mountains. The forest encompasses approximately 630,000 acres, of which the Eel airspace overlies the northern-most portion of the forest. Special management areas within the forest include the Sand Lake Recreation Area, Cascade Head Scenic Research Area, Mary's Peak Scenic Botanical Area, Cape Perpetua Scenic Area, Oregon Dunes National Recreation Area, Drift Creek Wilderness, Cummins Creek Wilderness, and Rock Creek Wilderness. The only special management areas beneath the airspaces are Sand Lake Recreation Area and Cascade Head Research Natural Area. Recreation uses within the park include

hiking, whale watching, birding, horseback riding, dune buggy driving, swimming, camping, and fishing (USFS 2012).

- *Sand Lake Recreation Area* consists of 1,076 acres of open sand dunes surrounded by forest and the Pacific Ocean. Recreation options available within the recreation area include fishing, swimming crabbing and kayaking in the Sand lake Estuary; hiking, wildlife viewing and camping. Off-Highway Vehicle (OHV) riding is available on the dunes and is managed by county law enforcement and the USFS in compliance with permits and regulations set by the State of Oregon (USFS 2012).
- *Sand Lake Research Natural Area* consists of 220 acres of unstabilized dune grassland communities found along the Oregon Coast. It is managed by the USFS and is located in the northwest portion of the Siuslaw National Forest, just north of the Sand Lake Recreation Area. Purposes for the establishment of the area includes research on the long-term community succession following catastrophic fire within an undisturbed parabola dune system, and the protection of unstabilized dune grass and associated Sitka spruce and western hemlock forest (Pacific Northwest Interagency Natural Areas Network 2013).
- *Cascade Head Research Natural Area* includes an 11,890 acre experimental forest and a 9,670 acre scenic research area. The entire area is designated a Biosphere Reserve as part of the United Nations Biosphere Reserve system. It is managed jointly by the USFS and research partners. Research partners include The Nature Conservancy, state and private universities in Oregon and Washington, Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Agriculture, National Aeronautics and Space Administration (NASA), USEPA, and NMFS. Listed endangered species found within the area include the northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), Coho salmon (*Oncorhynchus kisutch*), and Oregon silver spot butterfly (*Speyeria zerene hippolyta*) (Forest Science Lab 2013). Recreation available within the Natural Area is limited to hiking only. Overnight camping is not permitted (USFS 2012).
- *Neskowin Crest Research Natural Area* consists of a 1,190 acre area managed by the USFS and located in the northwestern corner of the Cascade Head Experimental Forest. It is managed in an undisturbed condition as much as possible where compatible with objectives of the Cascade Head Experimental Forest and the Cascade Head Scenic Research Area (USFS 1990). Neskowin Crest Research Natural Area is located within the boundaries of both the Cascade Head Research Natural Area and the Siuslaw National Forest.

- *Reneke Creek Research Natural Area* consists of 480 acres managed by the USFS. The most notable scientific feature of this RNA is an ecosystem dominated by red alder that is drained by two matched perennial streams. These streams are particularly useful for studying nutrient cycling in a deciduous forest (USFS 1990). Reneke Creek Research Natural Area is located within the boundaries of the Siuslaw National Forest, but outside of the Cascade Head Research Area.
- *High Peak - Moon Creek Research Natural Area* consists of a 1,526 acre tract of coniferous forest containing stands of 100- to 150-year-old Douglas-fir, a small, old-growth (500+) years Douglas-fir dominated stand, and riparian vegetation. It is managed by the BLM. Research within the Natural Area has focused on distribution, habitat, and population for various species, and studies focusing on old-growth stand characterizations and conditions for forest communities (USFS 2006). High Peak - Moon Creek Research Natural Area is within the boundaries of the Eel MOA, but outside the boundaries of the Cascade Head Research Natural Area and the Siuslaw National Forest.
- *Hebo and Little Hebo Experimental Research Areas* are plots within the Siuslaw National Forest that are part of a Long-term Ecosystem Productivity study taking place at various sites on the Olympic Peninsula, Oregon Cascades, Coastal Siskiyou, Oregon Coast Range, and the Washington Cascades. The experiment is led by the Forest Science Laboratory, which is managed under the USFS. The experiment seeks to evaluate the 200-year effects of plant assemblage and woody-debris changes on soil properties linked to productivity and on actual net primary productivity and diversity of these assemblages (Forest Science Lab 2000).
- *Saddle Bag Mountain Research Natural Area* is a 300-acre tract of land occupying the summit and western slopes of Saddle Bag Mountain managed by the BLM. A notable scientific feature of the RNA includes populations of Pacific silver fire and noble fire that have been isolated on and near Saddle Bag Mountain for hundreds of years representing genetically unique populations due to their long periods of isolation. Research in the RNA has focused on Old Growth communities, biological monitoring studies, and the establishment of four permanent vegetation plots to characterize and monitor change in forest composition and structure (USFS 2007). Saddle Bag Mountain Research Natural Area is within the boundaries of the Eel MOA, but outside the boundaries of the Cascade Head Research Natural Area and the Siuslaw National Forest.

National Parks

The National Park System is comprised of diverse units ranging from historical structures to cultural and natural areas. National Parks are managed for the protection of natural and cultural resources and for public recreation and sight-seeing. Portions of one National Park occur beneath the Eel airspace.

Lewis and Clark National Historical Parks is made up of 12 separate park sites located along an approximate 40-mile stretch of the Pacific Coast from Long Beach, Washington to Cannon Beach, Oregon. Parks include: Cape Disappointment State Park, Washington; Fort Columbia State Park, Washington; Fort Stevens State Park, Oregon; Ecola State Park, Oregon; and Sunset Beach State Park, Oregon. The parks commemorate the Lewis and Clark expedition and Native American cultures on the Pacific Coast by providing historical and cultural information, displays and interactive experiences (National Park Service 2006).

National Wildlife Refuges

The USFWS manages 95.4 million acres nationally, primarily to conserve and protect wildlife and plants. The 793 units of the NWR System include refuges, waterfowl production areas, and wildlife coordination units. Units can be created by an act of Congress or executive order, and the USFWS also may acquire lands for migratory bird purposes. Five NWRs occur beneath the Eel airspace.

Lewis and Clark NWR is located within Clatsop County beneath the northeastern boundary of Eel A and encompasses approximately 35,000 acres of tidelands and open water in the Columbia River estuary. Of the 35,000 acres, approximately 8,300 acres are made up of islands and sand bars. The refuge is managed by the USFWS and includes monitoring wildlife populations, improving island habitats, regulating waterfowl hunting, and coordinating with local, state, and other federal agencies relative to human activities in the estuary. Wildlife found in the refuge includes a variety of shorebirds, waterfowl, fish, and mammal species. Recreation and education opportunities available include fishing, hunting, and wildlife observation and photography (USFWS 2013).

Oregon Islands NWR is divided into a number of small units that include all rocks and islands off the shore of Oregon and above the mean high tide line. That equates to approximately 1,853 rocks, reefs and islands, two headland areas, and approximately 320 miles of the Oregon coast, underlying the Eel MOA/ATCAA Complex. Wildlife found in the refuge includes seabirds, seals, and sea lions. Recreation includes beach going, environmental education, photography, and wildlife observation. Boaters are requested to maintain a distance of 500 feet from all rocks and islands. Further, aircraft are requested to maintain 2,000 feet AGL from all rocks, reefs, and islands (USFWS 2013).

Cape Meares NWR is located within Tillamook County beneath Eel C and includes approximately 138 acres managed by the USFWS. The refuge encompasses old-growth forest dominated by Sitka spruce and western hemlock. Wildlife common to the refuge includes tufted puffins (*Fratercula cirrhata*), common murrelets (*Uria aalge*), bald eagles (*Haliaeetus leucocephalus*), sea lions, harbor seals (*Phoca vitulina*), and grey whales (*Eschrichtius robustus*). Recreation opportunities include guided tours of the historic lighthouse, wildlife observation, and photography (USFWS 2013).

Siletz Bay NWR is located within Lincoln County beneath Eel D and encompasses 513 acres of protected salt marsh, brackish marsh, tidal sloughs, mudflats, and coniferous and deciduous forestland. It provides nursery habitat for salmon, steelhead, and cutthroat trout (*Oncorhynchus* spp.). Wildlife found in the refuge includes a variety of waterfowl, raptors, amphibians, reptiles, and mammal species. Recreation opportunities include wildlife observation, photography, and interpretive paddle tours through Siletz Bay Refuge (USFWS 2013).

Nestucca Bay NWR is located within Tillamook County and underlies the boundary between Eel C and D encompassing approximately 888 acres of tidal marsh, tidal mudflats, grassland, woodland, pasture, forested lag, and freshwater bogs. A major purpose of the refuge is to provide wintering habitat for geese. The Nestucca Bay NWR supports about one tenth of the world's Dusky Canada Goose (*Branta canadensis occidentalis*) population. The refuge is closed to all public use, except on two occasions in February and October.

Three Arch Rocks is located within Tillamook County beneath Eel C and consists of 15 acres on three large and six small rocky islands located approximately 0.5 miles offshore. It is one of the smallest designated wilderness areas in the U.S., but features the largest colony of breeding tufted puffins (*Fratercula cirrhata*) and the largest common murre (*Uria aalge*) colony south of Alaska. It is the only northern Oregon pupping site for the threatened Steller sea lion (*Eumetopias jubatus*).

Areas of Critical Environmental Concern

The BLM manages 261.5 million acres nationally and has a multiple-use, sustained-yield mandate that supports a variety of uses and programs, including energy development, timber harvesting, recreation, grazing, wild horses and burros, cultural resources, and conservation. BLM managed lands beneath the existing Eel ATCAA include four Areas of Critical Environmental Concern (ACEC):

- *Elk Creek ACEC* is located within Tillamook County and underlies segment C of the Eel Airspace. Resources designated for special management include botanical, fish and wildlife, and natural process resources.
- *Nestucca River ACEC* is located within Tillamook County and underlies with eastern boundary of segment C of the Eel Airspace. Resources designated for special management include fish and wildlife, and scenic resources.
- *Lost Prairie ACEC* is located within Lincoln County and underlies with segment D of the Eel Airspace near the southeastern boundary of the segment. Resources designated for special management include botanical and natural process resources.

Wild and Scenic Rivers

There are no designated wild and scenic rivers within Clatsop, Tillamook, Yamhill, Lincoln, or Pacific counties.

National Historic Trails

The proposed Eel MOA/ATCAA is not located above either the California or the Oregon National Historic Trails nor any of the proposed routes included in the

NPS Feasibility Study. However, the proposed Eel A MOA is located over a small portion of the Lewis and Clark National Historic Trail along the Columbia River.

Tribal Lands

The Confederated Tribes of the Siletz Indians is located in the northeastern part of Lincoln County, but outside of the proposed Eel MOA/ATCAA. Land area affiliated with the Confederate Tribes of Grand Ronde Community is located in the northwestern region of Polk County and the southwestern portion of Yamhill County beneath the proposed Eel MOA/ATCAA. Additionally, the Shoalwater Bay Tribe has land located on the north shore of Willapa Bay. See Section 3.5, *Cultural Resources* for additional information regarding Native American tribes.

Marine Protected Areas

On-going activities off the coast of Oregon include commercial fishing, recreational fishing, and wildlife viewing (Oregon State University 2012). Numerous marine protected areas have been established off of the Oregon coast, which are managed by state and federal resource agencies.

Marine Protected Areas existing below the Eel and W-570 airspaces are listed below with usage descriptions applicable to each area. National marine protected areas have the conservation and protection focus identified for each area (ODFW 2013, NOAA 2012).

- *Columbia River Salmon Conservation Zone* is located off the coast of Clatsop County and underlies segment A of the Eel Airspace. Commercial and recreational fishing are restricted. The conservation focus is natural heritage and sustainable fishery production.
- *Haystack Rock Marine Garden* is located off the coast of Clatsop County and underlies segment B of the Eel Airspace. Commercial and recreational fishing are restricted. The conservation focus for the reserve is natural heritage and the protection focus is on intertidal and seabird colony resources.
- *Boiler Bay Research Reserve* is located off the coast of Lincoln County and crosses the boundary between segment D of the Eel Airspace and undesignated airspace near the southern boundary of the segment. Commercial and recreational fishing are restricted. The conservation focus

for the reserve is natural heritage and the protection focus is on diverse intertidal habitat.

- *Cape Kiwanda Marine Garden* is located off the coast of Tillamook County and underlies segment C of the Eel Airspace near the southern boundary of the segment. Commercial and recreational fishing are restricted. The conservation focus for the reserve is natural heritage and the protection focus is on intertidal communities and seabird nesting
- *Netarts Bay Shellfish Preserve* is located off the coast of Tillamook County and underlies segment C of the Eel Airspace. Commercial and recreational fishing are restricted. The conservation focus for the reserve is natural heritage and the protection focus is on Olympia oysters.
- *Cascade Head North Marine Protected Area* is located off the coast of Lincoln County and Tillamook County. It underlies segment D of the Eel Airspace. Commercial and recreational salmon, crabbing, and groundfish fishing are permitted. All other extractive uses including new ocean development are prohibited.
- *Cascade Head West Marine Protected Area* is located off the coast of Lincoln County near the northern boundary between Lincoln County and Tillamook County, along the western boarder of Cascade Head Marine Reserve. It underlies segment D of the Eel Airspace. Commercial and recreational salmon fishing and crabbing are allowed. All other extractive uses including new ocean development are prohibited.
- *Cascade Head South Marine Protected Area* is located off the coast of Lincoln County near the northern boundary between Lincoln County and Tillamook County. It underlies segment D of the Eel Airspace. Use of trawls, nets, and new ocean development are prohibited.
- *Cascade Head Marine Reserve* is located off the coast of Lincoln County near the northern boundary between Lincoln County and Tillamook County. It underlies segment D of the Eel Airspace. No extractive activities are allowed.
- *Cape Falcon Shoreside Marine Protected Area* is located off the coast of Lincoln County near the northern boundary between Lincoln County and Tillamook County. It underlies segment B of the Eel Airspace. Recreational fishing and crabbing are allowed from shore.
- *Cape Falcon West Marine Protected Area* is located off the coast of Clatsop County and Tillamook County, along the western boundary of Cape Falcon Marine Reserve. It underlies segment B of the Eel Airspace. Commercial and recreational salmon fishing and crabbing are allowed. All other extractive uses including new ocean development are prohibited.

- *Cape Falcon Marine Reserve* is located off the coast of Lincoln County near the northern boundary between Lincoln County and Tillamook County. It underlies segment B of the Eel Airspace. No extractive activities are allowed.

JUNIPER/HART MOA COMPLEX

The existing Juniper/Hart MOA Complex overlies approximately 7,928 square miles extending in a north to south direction from approximately 25 miles south of the Grant/Harney County line, in Oregon to approximately 15 miles north of the Humboldt/Pershing County line in Nevada. Central Oregon and northern Nevada are primarily arid due to the rain shadow effect of the Cascades on the western boundary of the region. Outdoor recreational activities, timber, and ranching are the primary economic activities. Lands underlying the Juniper/Hart MOA Complex are predominantly managed by the BLM. Other federally managed lands underlying the existing and proposed airspace include three NWRs and one Wild and Scenic River. Private land holdings are governed at the local level by county and city governments. No National Parks occur within these areas.

Local Land Use and Management

Proposed modifications to the Juniper MOA Complex would extend the training space east from the existing Juniper North and South MOAs, including the Juniper Low MOA. However, this extension would remain within Harney County. The extension of Hart North and South MOA east and south from its existing dimensions would extend the airspace in Harney County in Oregon and establish airspace over Humboldt County and Washoe County in northwestern Nevada. Modifications would also affect the existing Juniper Low MOA airspace over Crook, Deschutes, Lake and Harney County by raising the airspace floor from 300 feet to 500 feet AGL. The small section of airspace extending into the California would be unchanged under the Proposed Action.

Table G-2. Population and Urban Areas beneath the Proposed Juniper/Hart MOA Complex

Location	Area Square Miles	Population per Square Mile	Incorporated Cities	Unincorporated Communities
Harney County, OR	10,226	1	2	23
Lake County, OR	8,358	1	2	12
Deschutes County, OR	3,055	38	4	19
Crook County, OR	2,987	7	1	8
Humboldt County, NV	9,658	2	1	7
Washoe County, NV	6,551	67	2	66

Source: U.S. Census Bureau 2010.

Harney County

Harney County has a total area of 10,226 square miles, of which 10,134 square miles are land and 92 square miles are water, mostly as part of Malheur Lake. The population of Harney County is 7,422 with a population density of approximately one (1) person per square mile (U.S. Census Bureau 2010). The county contains two incorporated cities (Burns and Hines) and 23 unincorporated communities. Urban development is concentrated within the City of Burns, with the rest of the county being very rural.

Harney County is in the eastern half of the state and falls into the Farm Zoning as designated by the Oregon Department of Land Conservation and Development (State of Oregon 2009). Prominent land uses include farming and ranching (Harney County 2009).

Land area affiliated with the Summit Lake Paiute Tribe is located in the northern part of the county.

Lake County

Lake County has a total area of 8,358 square miles, of which 8,136 square miles are land and 223 square miles are water. The population of Lake County is 7,895 with a population density of approximately one (1) person per square mile (U.S. Census Bureau 2010). The county contains two incorporated cities (Lakeview and Paisley) and 12 unincorporated communities. Lake County is in the south eastern half of

the state and falls into the Farm Zoning as designated by the Oregon Department of Land Conservation and Development (Oregon Department of Land Conservation and Development 2009). Land use is focused on lumber and agricultural uses (Lake County 2011).

Deschutes County

Deschutes County has a total area of 3,055 square miles, of which 3,018 square miles are land and 37 square miles are water. The population of Deschutes County is 157,733 with a population density of approximately 38 people per square mile (U.S. Census Bureau 2010). The county contains four incorporated cities (Lakeview and Paisley) and 19 unincorporated communities. Urban development is concentrated the cities of Bend, Redmond, and La Pine, with the rest of the county being very rural.

Deschutes County is in the center of the state and falls primarily into the Farm Zoning as designated by the Oregon Department of Land Conservation and Development (State of Oregon 2009), though forest zoning may be found along the western boundary of the county as the landscape enters the Cascade Mountain Range. Prominent land uses include management for recreation and tourism activities, logging, and farming (Deschutes County 2011). The most southeastern portion of the county is covered by the airspace.

Crook County

Crook County has a total area of 2,987 square miles, of which 2,979 square miles are land and 8 square miles are water. The population of Crook County is 20,978 with a population density of approximately seven (7) people per square mile (U.S. Census Bureau 2010). The county contains one incorporated city (Prineville) and eight (8) unincorporated communities. Crook County is located to the north of Deschutes County. The airspace would only cover a portion along the southern boundary of the county. Land use includes ranching, logging, recreation, agriculture and farming (Crook County 2012).

Humboldt County

Humboldt County is located in northern Nevada and has a total area of 9,658 square miles, of which 9,648 square miles are land and 10 square miles are water. The population of Humboldt County is 16,528 with a population density of approximately two (2) people per square mile (U.S. Census Bureau 2010). The county contains one incorporated city (Winnemucca) and seven (7) unincorporated communities. Mining and agriculture are two of the main types of land use (Humboldt County 2005). The major city within Humboldt County is Winnemucca.

Washoe County

Washoe County is located in the western part of Nevada. Washoe County has a total area of 6,551 square miles, of which 6,342 square miles are land and 209 square miles are water. The population of Washoe County is 421,407 with a population density of approximately 67 people per square mile (U.S. Census Bureau 2010). The county contains two incorporated cities (Reno and Sparks) and 66 unincorporated communities.

Urban development is concentrated in the southern part of the county in and around the cities of Reno and Sparks. The proposed airspace expansion would only extend into the northern part of the county. The northern part of the county is rural. The major land use designation in the northern part of the county is public lands with significant portions identified as wilderness area, and wilderness study areas.

State Land Use and Management

Areas managed by agencies of the State of Oregon include state forests and state parks. No state forests occur within the existing Juniper/Hart MOA Complex.

State Parks

Management of Oregon state parks is focused on providing for multiple uses including recreation, education, and conservation. State parks are governed

primarily by regulations and policies contained within the individual or regional state park plans. There are 15 state parks located below the existing Juniper/Hart MOA Complex and the proposed Juniper/Hart Expansion Area, which are listed below:

- Frenchglen State Park
- Pete French Round Barn State Park
- Fort Rock State Park
- Three Sisters
- Smith Rock State park
- Redmond-Bend Juniper State Park
- Robert Sawyer Shop State Park
- La Pine State Park
- Chandler State Park
- Booth State Park
- Goose Lake State Park
- Peter Skene Ogden State Park
- Cline Falls State Park
- Tumalo State Park
- Pilot Butte State Park

Federal Land Use and Management

Federally managed areas existing below the proposed airspace modifications include lands managed by the USFS, USFWS, and BLM, as described below.

National Forests

Malheur National Forest is located in Eastern Oregon and encompasses approximately 1.7 million acres that are managed by the USFS. The forest is managed under a multi-use principle, which includes recreation, logging, and conservation. Vegetation includes high desert grasslands, sage, juniper, pine, fir, and alpine meadows (USFS 2012). Recreation uses are consistent with those described for the Umatilla National Forest above.

Fremont-Winema National Forest, framed by major migratory bird flyways, offers a setting of classic Western beauty derived from the land's volcanic legacy. The ecosystem ranges from towering snow-capped peaks to wide-open sage basins. Pivotal to the economy and communities of south central Oregon, this 2.3 million acre forest is known for its many recreational opportunities, scenic vistas and wild places where visitors can still find solitude.

National Wildlife Refuges

Malheur NWR consists of 187,000 acres in central Harney County, including Malheur, Mud, and Harney Lakes, and 120,000 acres of lake associated wetlands. The Diamond Craters Outstanding Natural Area is located adjacent to the eastern boundary of the refuge. It is managed by the USFWS and was established by President Theodore Roosevelt in 1908.

The refuge is located within the Pacific Flyway and serves as an important resting point for migratory bird species. Bird watching is a popular recreational activity at this refuge. Other wildlife in the area includes waterfowl and deer (*Odocoileus* spp.). Vegetation includes sagebrush, greasewood and wild rye (USFWS 2012).

Sheldon NWR, located in northern Nevada, consists of more than half a million acres of protected high desert habitat managed by the USFWS. It is part of the Sheldon-Hart Mountain NWR Complex that includes the Sheldon NWR in Nevada, and the Hart Mountain National Antelope Refuge in Oregon. Hart Mountain National Antelope Refuge is not located below any of the airspace proposed for modification. Sheldon NWR encompasses varied landscapes of deep gorges, lush springs, rolling hills, and rugged tablelands. Protected wildlife includes wintering herds of pronghorn antelope and bands of bighorn sheep. Old homesteads, the Virgin Valley mining district and geothermal hot springs can also be found within the refuge (USFWS 2011).

Hart Mountain Antelope NWR, is located on a massive fault block ridge that ascends abruptly nearly three quarters of a mile above the Warner Valley floor in a series of rugged cliffs, steep slopes, and knife-like ridges. Visitors experience views of the beautiful Warner Valley Wetlands while ascending the west side, which is cut by several deep gorges. Hart, Potter, and DeGarmo canyons, the most rugged, extend from the valley floor to the top of the main ridge. The east side of the mountain is less precipitous, descending in a series of rolling hills and low ridges to the sagebrush-grasslands typical of southeastern Oregon and the Great Basin. The rugged diversity of the terrain creates a rich mix of habitat types, home to more than 300 species of wildlife. Featured species include pronghorn antelope, California bighorn sheep, mule deer, sage grouse, and redband trout. The 278,000-acre refuge is one of the most expansive wildlife habitats in the arid West free of

domestic livestock. Since its creation in 1936 as a range for remnant herds of pronghorn antelope, management of the refuge has broadened to include conservation of all wildlife species characteristic of this high desert habitat and restoration of native ecosystems for the public's enjoyment education, and appreciation.

Bureau of Land Management

Steens Mountain Cooperative Management and Protection Area (CMPA) consists of approximately 428,156 acres located in central Harney County and is managed by the BLM and the Steens Mountain Advisory Council. Land within the CMPA is to be maintained and enhanced through cooperative projects between the BLM, private landowners, tribes, and other public interests. Sustainable grazing and recreational use is permitted in designated areas. The Steens Mountain Wilderness surrounds part of Steens Mountain making up approximately 170,166 acres of the CMPA's total 428,156 acres. Approximately 100,000 acres of this wilderness area is designated as livestock free. Land protections in addition to the designated CMPA and Wilderness Areas include approximately 900,000 acres of federal land in southeastern Oregon allocated as off limits to mineral and geothermal extraction (BLM 2012). This area also includes two Wild and Scenic Rivers.

Hawksie-Walksie Research Natural Area is a 17,328-acre Research Natural Area managed by the BLM in southern Oregon.

East Fork High Rock Canyon Wilderness Area is located in northern Nevada and is managed by the BLM. The 52,618-acre Wilderness Area includes large areas of broad volcanic uplands and deeply cut drainages. The main vegetation type is sagebrush, with willows, aspens and other riparian vegetation found in the canyons. Remains of early homesteads can be found in the East Fork of High Rock Canyon. Wildlife in the area includes California bighorn sheep, mule deer, pronghorn antelope, mountain lions, coyotes, and sage-grouse. Nesting habitat for raptors can be found in the canyons. The Applegate-Lassen Emigrant Trail is located along the western boundary of the area.

North Black Rock Range Wilderness Area is located in northern Nevada and encompasses the northern portion of the Black Rock Range. The 30,648-acre area

is managed by the BLM. The dominant vegetation is sagebrush and willows, cottonwoods, aspens, and riparian species, which can be found in canyons. Wildlife found in this area includes the threatened Lahontan cutthroat trout, as well as California bighorn sheep, mule deer, pronghorn antelope, mountain lions, coyotes, and sage-grouse.

Little High Rock Lake Wilderness Area consists of 48,355 acres in northern Nevada and is managed by the BLM. The area includes broad volcanic uplands, deep cut drainages, and Mahogany Mountain. The dominant vegetation type is sagebrush, with willows (*Salix* spp.), chokecherry (*Aronia* spp.), and other riparian vegetation found in canyons. Wildlife includes California bighorn sheep (*Ovis canadensis californiana*), mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), and sage-grouse (*Centrocercus urophasianus*). Habitat for nesting raptors can be found in the canyons.

High Rock Wilderness Area, located in Northern Nevada and managed by the BLM, is comprised of 59,107 acres. Sagebrush is the dominant vegetation type, with saltbush and greasewood occurring at lower elevations. Willows, cottonwoods, aspens, and other riparian species can be found in canyons. High Rock Lake occasionally fills with waters flowing from High Rock and Little High Canyons. A portion of the Applegate-Lassen Emigrant Trail crosses through the northern portion of the Wilderness Area and extends across Washoe County into California.

Other smaller wilderness areas include Mt. Washington NWA, Gearhart Mountain NWA, North Black Rock Range NWA, Three Sisters NWA, and Black Canyon NWA.

Areas of Critical Environmental Concern located below the Juniper/Hart MOA Complex are listed below with the resource area responsible for the areas designation.

- *High Rock Canyon ACEC*: Resources designated for special management include scenic, and fish and wildlife resources.
- *Warner Wetlands ACEC*: Resources designated for special management include cultural, fish and wildlife, natural processes, and scenic resources.

- *Lake Abert ACEC*: Resources designated for special management include cultural, fish and wildlife, natural processes, and scenic resources.
- *Abert Rim ACEC*: Resources designated for special management include botanical, cultural, and fish and wildlife resources.
- *Soldier Meadows ACEC*: In 1982, 307 acres were designated as the Soldier Meadows Area of Critical Environmental Concern to protect special natural heritage resources. The ACEC now contains 2,077 acres to protect these rare natural and cultural resources. Special rules apply to recreation and commercial uses in the ACEC

Wild and Scenic Rivers

Wild and Scenic Rivers are preserved for possessing outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Rivers or segments of rivers so designated are preserved in their free-flowing condition and are not dammed or otherwise impeded. National wild and scenic designation essentially vetoes the licensing of new hydropower projects on or directly affecting the river. It also provides very strong protection against bank and channel alterations that adversely affect river values, protects riverfront public lands from oil, gas and mineral development, and creates a federal reserved water right to protect flow-dependent values (USFS 2009). The modified airspace would extend over three Wild and Scenic Rivers.

The BLM is the agency responsible for managing the five segments of one National Wild and Scenic River. The Donner und Blitzen Wild and Scenic River system has nine river segments, though only five would be located below the airspace. The Donner und Blitzen Wild and Scenic River, along with two other rivers designated as Wild and Scenic (Wildhorse River and Kiger River) fall within Steens Mountain Cooperative Management and Protection Area (CMPA) (BLM 2005).

National Historic Trails

The proposed Juniper/Hart MOA Complex is not located above Oregon National Historic Trail or the Lewis and Clark National Historic Trail; however, the proposed Hart B, Hart E, and Hart F MOAs overlie small segments of the California National Historic Trail. Additionally, the proposed Juniper C MOA, including the proposed Juniper East Low MOA and the existing Juniper A and

Juniper B MOAs overlies segments of a proposed route of the Oregon National Historic Trail.

Tribal Lands

The Summit Lake Paiute Tribe is located south of the Sheldon National Wildlife Refuge in the western part of Humboldt County. The reservation was established in 1913 and is 12,573 acres with 10,098 acres of trust lands. Tribal headquarters are located in Sparks, Nevada.

Wind Development

Wind development testing is currently ongoing below the Juniper/Hart MOA Complex. There are two stages of wind development land use identified below the airspace. The first is an authorized right of way (ROW). This means that the land within the ROW is approved for wind tower development. The second is developed and existing wind towers. The authorized Wagontire wind test ROW is located predominately in Lake County, though a small portion of it extends into Harney County. The entire ROW is located below the existing Juniper Low MOA. Three existing Met towers are located in Lake County below the existing Juniper Low MOA. Met towers are used to gather wind data necessary for site evaluation and development of wind energy project. All three are identified by the BLM, though none are identified within the FAA's database of wind development. The first two, Wagontire Met1 and Wagontire Met2, are located within the authorized Wagontire ROW. The third tower, Little Glass Butte, is located north of the Wagontire ROW in a relinquished test ROW. A relinquished ROW is a test area that has been authorized for wind development but development has not been pursued. None of the existing ROWs or Met towers adversely impact training activities within the existing Juniper Low MOA (Oregon ANG 2013). No other authorized or existing wind developments exist below the existing Juniper/Hart MOA Complex.

REDHAWK MOA COMPLEX

The proposed establishment of the Redhawk MOA Complex would create an approximately 6,518-square mile training space in north-central Oregon over

portions of Sherman, Gilliam, Morrow, Grant, Wheeler, Jefferson, and Wasco counties. Central Oregon is primarily arid due to the rain shadow effect of the Cascades on the western boundary of the region. Outdoor recreational activities, timber, and ranching are the primary economic activities. Lands underlying the proposed Redhawk MOA Complex are predominantly privately owned. Private land holdings are governed at the local level by county and city governments. State controlled lands include 11 state parks. Federally managed lands underlying the proposed airspace include portions of three national forests, one national monument, and two wild and scenic rivers.

Local Land Use and Management

The proposed Redhawk MOA Complex would overlie Sherman, Gilliam, Morrow, Grant, Wheeler, Jefferson, Crook, and Wasco counties. This area is predominantly privately owned lands utilized for agriculture, primarily ranching, as well as some timber production.

Table G-3. Population and Urban Areas within Proposed Redhawk MOA Complex

Location	Area Square Miles	Population per Square Mile	Incorporated Cities	Unincorporated Communities
Sherman County	831	2	4	10
Gilliam County	1,223	2	3	8
Morrow County	2,047	5	5	11
Grant County	4,529	2	9	18
Wheeler County	1,715	1	3	9
Jefferson County	1,791	12	3	12
Crook County	2,987	7	1	8
Wasco County	2,395	10	6	23

Source: U.S. Census Bureau 2010.

Sherman County

Sherman County has a total area of 831 square miles, of which 823 square miles are land and eight (8) square miles are water. The population of Harney County is 1,765 with a population density of approximately two (2) people per square mile

(U.S. Census Bureau 2010). The county contains four incorporated cities (Grass Valley, Moro, Rufus, and Wasco) and 10 unincorporated communities.

Sherman County is sparsely populated; the largest city within the county has a population of just 380 people. The economy is rural and major type of land use is farming and ranching. The Sherman Agricultural Research Station is located outside of Moro in the northern portion of the county (Sherman County 2012). The county is predominantly an agricultural county, primarily wheat and barley, although the local economy includes ranching and tourism. The county contains the Biglow Canyon Wind Farm, the largest wind farm in Oregon. Additionally two wind energy generating facilities have been proposed within Sherman County (Oregon State University 2012).

Gilliam County

Gilliam County has a total area of 1,223 square miles, of which 1,204 square miles is land and 19 square miles is water. The population of Gilliam County is 1,871 with a population density of approximately two (2) people per square mile (U.S. Census Bureau 2010). The county contains three incorporated cities (Arlington, Condon, and Lonerock) and eight unincorporated communities.

Gilliam County is predominantly an agricultural county, with urban development concentrated in the county's two major cities: Arlington and Condon (Gilliam County 2012). Additionally, there are four proposed wind energy generating facilities located within Gilliam County (Oregon State University 2012).

Morrow County

Morrow County has a total area of 2,047 square miles, of which 2,031 square miles are land and 16 square miles are water. The population of Morrow County is 11,173 with a population density of approximately five (5) people per square mile (U.S. Census Bureau 2010). The county contains five incorporated cities (Boardman, Heppner, Ione, Irrigon, and Lexington) and 11 unincorporated communities.

Morrow County is bisected by the Blue Mountains; north of the mountains land use is predominantly agricultural, south of the mountains the land is forested with land use more oriented around forestry. Three wind energy generating facilities are proposed within Morrow County (Oregon State University 2012). Urban development that would be located below the airspace is limited to the City of Heppner.

Grant County

Grant County has a total area of 4,529 square miles, of which 5,228 square miles are land and one (1) square mile is water. The population of Grant County is 7,445 with a population density of approximately two (2) people per square mile (U.S. Census Bureau 2010). The county contains nine incorporated cities and 18 unincorporated communities. Grant County has a forested and mountainous landscape. Land use is predominantly forestry and ranching uses.

Wheeler County

Wheeler County has a total area of 1,715 square miles, including approximately 1 square mile of water. The population of Wheeler County is 1,441 with a population density of approximately one (1) person per square mile (U.S. Census Bureau 2010). The county contains three incorporated cities (i.e., Fossil, Mitchell, and Spray) and nine unincorporated communities. Wheeler County contains a mix of mountainous and forested terrain. Ranching and forestry are the predominant land uses within the county.

Jefferson County

Jefferson County has a total area of 1,791 square miles, of which 1,781 square miles are land and 10 square miles are water. The population of Jefferson County is 21,720 with a population density of approximately 12 people per square mile (U.S. Census Bureau 2010). The county contains three incorporated cities (i.e., Culver, Madras, and Metolius) and 12 unincorporated communities.

Agriculture is the predominant source of income in this county, with vegetable, grass and flower seeds, garlic, mint and sugar beets cultivation. Jefferson County also has vast rangelands and an industrial base related to forest products.

The Confederated Tribes of the Warm Springs area located in the northwestern area of the county. The proposed airspace would only extend over the eastern half of the county and the airspace above the Confederated Tribes of the Warm Springs would not be impacted.

Crook County

Crook County has a total area of 2,987 square miles, of which approximately eight square miles is water. The population of Crook County is 20,978 with a population density of approximately seven (7) people per square mile (U.S. Census Bureau 2010). The county contains one incorporated city (i.e., Prineville) and eight unincorporated communities.

Agriculture and forestry are the predominant land uses, which include the cultivation of hay, grain, mint, potatoes, and seed. Range and forest lands allow grazing for a sizable livestock industry. The proposed airspace would cover the northern-most extent of the county. Land use in this northern extent is predominantly within the Ochoco National Forest, which is a main source of lumber as well as popular for tourism and recreation (Crook County 2012).

Wasco County

Wasco County has a total area of 2,395 square miles, of which 2,381 square miles are land and 14 square miles are water. The population of Wasco County is 25,213 with a population density of approximately 10 people per square mile (U.S. Census Bureau 2010). The county contains six incorporated cities (i.e., Antelope, Dufur, Maupin, Mosier, Shaniko, and The Dalles) and 23 unincorporated communities.

The county's economy is based upon agriculture, including orchards, wheat farming, and livestock ranching, as well as lumber, manufacturing, electric power, transportation, and tourism. Land use in the northern and eastern parts of the

county is dominated by agriculture, and land use in the western part of the county contains more forested areas utilized for timber production and recreation. Additionally, two wind energy generating facilities have been proposed within Wasco County (Oregon State University 2012).

Wind Development

Multiple wind towers have been approved and proposed within Sherman County along the northern boundary of the proposed Redhawk MOA Complex. A single tower has been proposed and approved within Wasco County beneath the proposed Redhawk MOA Complex. The towers in Sherman County are proposed at a height of 500 feet and the wind tower in Wasco County is proposed at a height of 265 feet (Oregon State University 2012).

State Lands and Management

Areas managed by agencies of the State of Oregon include state forests and state parks. No state forests occur beneath the proposed Redhawk MOA Complex.

State Parks

As previously described, the management of Oregon state parks is focused on providing for multiple uses including recreation, education, and conservation. State parks are governed primarily by regulations and policies contained within the individual or regional state park plans. There are 11 state parks located below the proposed Redhawk MOA Complex, which are listed below:

- Cottonwood Canyon State Park
- White River Falls State Park
- Memaloose State Park
- Koberg Beach State Park
- J.S. Burres State Park
- Deschutes-Hilderbrand State Park
- Mayer State Park
- Somers State Park
- Cove Palisades State Park
- Deschutes-Hilderbrand State Park
- John Day Chaparral Access State Park

Federal Lands and Management

The proposed Redhawk MOA Complex overlies approximately 6,518 square miles in a roughly rectangular shape above parts of Sherman, Gilliam, Morrow, Grant, Wheeler, Jefferson, and Wasco counties. Federally managed areas existing below the proposed airspace modifications include lands managed by the USFS, National Park Service, and BLM, as described below.

National Forests

Umatilla National Forest extends through northeastern Oregon and southeastern Washington encompassing approximately 1.4 million acres managed by the USFS. Only the most western portion of the Umatilla National Forest would be covered by the proposed Redhawk MOA Complex. There are no designated wildernesses that would be covered by the proposed airspace. Recreation uses within the park include campgrounds, lake activities, river rafting, snow activities, hiking, and mushroom and huckleberry gathering. Wildlife found within this area include a variety of fish, bird, and mammal species (USFS 2012).

Malheur National Forest is located in Eastern Oregon and encompasses approximately 1.7 million acres that are managed by the USFS. The proposed Redhawk MOA Complex would only extend above a northwestern portion of the forest. The forest is managed under a multi-use principle, which includes recreation, logging, and conservation. Vegetation includes high desert grasslands, sage, juniper, pine, fir, and alpine meadows (USFS 2012). Recreation uses are consistent with those described for the Umatilla National Forest above.

Ochoco National Forest encompasses 850,000 acres of which approximately 95,000 are estimated to be old growth. It is managed by the USFS and occupies lands within Crook, Harney, Wheeler, and Grant counties. Wilderness areas within the Ochoco National Forest are: Black Canyon Wilderness, Bridge Creek Wilderness, and Mill Creek Wilderness. The proposed Redhawk MOA Complex would only extend over Bridge Creek and Mill Creek Wildernesses (USFS 2012).

Bridge Creek Wilderness is a 5,357 acre wilderness area in Wheeler County managed by the USFS. The wilderness area includes a portion of the Ochoco

Mountains with North Point peak and East Point peak located within Bridge Creek Wilderness. Vegetation includes white fir (*Abies concolor*), lodgepine (*Pinus contorta*), sagebrush, and bunchgrass. Water features within the area include: Thompson, Pisgah, Masterson, Nelson, and Maxwell springs.

Mill Creek Wilderness is a 17,323 acre wilderness area in Crook County managed by the USFS. It includes two tributaries of the Ochoco Creek, Mill Creek and Marks Creek, which are home to small trout. Vegetation includes prairie and open meadow communities, lodgepole pine forest, and ponderosa pine (*Pinus ponderosa*).

National Parks

John Day Fossil Beds National Monument consists of three widely separated units (i.e., Sheep Rock, Painted Hills, and Clarno) in east-central Oregon. The proposed airspace would be located over the Clarno and Painted Hills units. The National Monument is managed by the National Park Service and is known for its well-preserved layers of fossil plants and animals. The area is an important area of paleontological research, but is also popular for camping, hiking, river rafting, fishing, and mountain biking (National Park Service 2013).

Wild and Scenic Rivers

The BLM and the USFS are the agencies responsible for managing the two National Wild and Scenic Rivers beneath the proposed Redhawk MOA Complex. Two wild and scenic rivers occur beneath the proposed Redhawk MOA Complex: the Deschutes River and the John Day River. The Deschutes River is designated a National Scenic River for 30 miles and a National Recreation River for 143 miles.

National Historic Trails

The proposed Redhawk MOA Complex is not located above either the California or Oregon National Historic Trail or the Lewis and Clark National Historic Trail. However, the proposed Redhawk A and Redhawk C MOAs are located over small segments of a proposed route of the Oregon National Historic Trail.

Tribal Lands

The Confederated Tribes of the Warm Springs are located west of the proposed airspace; no portion of tribal land is located below the proposed airspace.

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