FINAL REPORT

CRITICAL AREA (PRIORITY HABITAT & SPECIES) RECOMMENDED MITIGATION MEASURES

Port of Olympia/ Olympia Regional Airport

Mead & Hunt

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CRITICAL AREA (PRIORITY HABITAT & SPECIES) RECOMMENDED MITIGATION MEASURES

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Acronyms

AC	Advisory Circular
ACUB	Army Compatible Use Buffer Program
BMP	Best Management Practice
CFR	Code of Federal Regulations
CLT	California Least Tern
CNLM	Center for Natural Lands Management
ESA	Endangered Species Act
FAA	Federal Aviation Administration
GMA	Growth Management Act
HCP	Habitat Conservation Plan
HMP	Habitat Management Plan
LTAA	Likely to Adversely Affect
MPU	Master Plan Update
NRCS	Natural Resource Conservation Service
NEPA	National Environmental Policy Act
NLTAA	Not Likely to Adversely Affect
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
RPZ	Runway Protection Zone

ACRONYMS

SEPA	State Environmental Policy Act
TMC	Tumwater Municipal Code
TNC	The Nature Conservancy
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WS	Wildlife Services
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources

Olympia Regional Airport

Draft Critical Area (Priority Habitats & Species) Recommended Mitigation Measures

INTRODUCTION.

The Port of Olympia (Port) is in the process of preparing a Master Plan Update (MPU) for Olympia Regional Airport (Airport), which is intended to document and support the maintenance, modernization, and long-term development of the overall aviation facility over a 20-year planning horizon. Advisory Circular (AC) 150/5070-6B, Airport Master Plans states, "The goal of a master plan is to provide the framework needed to guide future airport development that will cost-effectively satisfy aviation demand, while considering potential environmental and socioeconomic impacts".

The most recent planning document for Olympia Regional Airport (i.e., the *Airport Layout Plan Update*) was completed in 2003, with the Airport Layout Plan Drawing Set being planned to reflect "as-built" construction projects in 2010. The planning focus of the current MPU has been the total aviation facility and its environs, with the overall planning goal being the continued development of an airport that can accommodate future demand and that is not significantly constrained by its environs. In addition, due to specific environmental issues related to the existence of protected habitat and species on the Airport, as defined by the Washington State Department of Fish and Wildlife (WDFW), the MPU work scope included the preparation of an expanded critical areas/protected habitats and species environmental inventory assessment that is presented in Appendix One of this document, entitled *Airport Critical Area/Priority Habitat & Species White Paper*. WDFW Staff conducted a comprehensive review of that document, and a comment summary matrix is available for reference.

The general findings and conclusions information presented in the Appendix One White Paper served as the foundation and guidance for the development of this draft agency habitat management/mitigation document for the existing protected habitat and species located on the Airport. Additionally, WDFW reviewed and provided responses to the *Olympia Regional Airport Draft Habitat Management Plan* and to the *5-Year Airport Map of Planned Activities* that provided recommendations concerning six prairie species and their habitats inhabiting or potentially inhabiting Olympia Regional Airport. Contained in these responses were management recommendations for three (3) habitat areas: the Mazama Pocket Gopher/ Oregon Vesper Sparrow, the Streaked Horn Lark, and the Butterfly/Prairie Habitat that are illustrated in Appendix One. Comments were also provided for recommendations on Best

Management Practices (BMPs) that would seek to ensure the long-term viability of the protected species and habitat.

The following *Mitigation Measures Agreement Outline* is intended to help develop an agreed upon plan to protect and mitigate State species of concern that are located at Olympia Regional Airport. Ultimately, this plan can be used to update the existing 2008 Interlocal Agreement between the Port of Olympia and WDFW for the "Protection and Mitigation of State Species of Concern at Olympia Regional Airport".

Olympia Regional Airport Recommended Mitigation Measures Agreement

SECTION ONE.

CRITICAL AREA (WILDLIFE HABITAT) INVENTORY/REGULATORY FRAMEWORK

The State of Washington's Growth Management Act (GMA) requires cities and counties to write comprehensive plans and development regulations to manage growth and prevent urban sprawl through the protection of five types of critical areas. These include important fish and wildlife habitat areas, wetlands, critical aquifer recharge areas, frequently flooded areas, and geologically hazardous areas (i.e., bluffs). In response to these GMA requirements, the City of Tumwater has adopted a Conservation Plan, as a part of their Comprehensive Plan, which identifies, protects, and conserves critical environmental areas and valuable natural resources. The Conservation Plan specifically addresses these topics in the following categories: Natural Resource Land Conservation (consisting of agricultural lands, forest lands, and mineral resource lands) and Critical Areas Protection (consisting of wetlands, aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat areas). Thurston County also updated their Critical Areas Regulations in July 2012.

A summary of protected species and habitats, including jurisdictional status that are known to occur, or potentially exist within, or in the vicinity of Airport property, is provided in the following table (i.e., Table 1), and a detailed description of this information is presented in Appendix One of this document.

Table 1
Protected Species and Habitats Known to Occur or Potentially Exist within Olympia Regional Airport

Name	Scientific Name	Type	State Status	Federal Status	Critical Habitat
Mazama pocket gopher	*Thomomys mazama*	Mammal	Threatened	Proposed Threatened	Proposed
Oregon vesper sparrow	*Pooecetes gramineus affinis*	Bird	Candidate	Species of Concern	Not Designated
Streaked horned lark	*Eremophila alpestris strigata*	Bird	Endangered	Proposed Threatened	Proposed
Taylor's checkerspot	*Euphydryas editha taylori*	Butterfly	Endangered	Proposed Endangered	Proposed
Mardon skipper	*Polites mardon*	Butterfly	Endangered	None	None
Puget blue	*Plebejus icarioides blackmorei*	Butterfly	Candidate	None	None
Valley silverspot	*Speyeria zerene bremnerii*	Butterfly	Candidate	Species of Concern	Species of Concern
Westside dry prairie	Not applicable	Habitat	Priority Habitat	None	None

Sources: WDFW 2012a; USFWS 2012a

Three species identified on Table 1, the streaked horned lark, Taylor's checkerspot, and the Mazama pocket gopher were proposed for listing by the U.S. Fish and Wildlife Service (USFWS) in the Fall of 2012. The Streaked horned lark and Taylor's checkerspot were proposed on October 11, 2012 (Federal Register 77, No. 225), with the Mazama pocket gopher being proposed for listing on December 11, 2012 (Federal Register 77, No. 238). In addition, the designation of critical habitat for these three species is also being proposed. USFWS is currently accepting comments on the proposed listing (through December 10, 2012 and February 11, 2013 respectively) and will release their final listing determination following a review of information received from the public, government agencies, the scientific community, industry, and other interested parties.

On September 4, 2012 (Federal Register 77, No. 171) USFWS announced that the listing of the butterfly species mardon skipper is not warranted and the species has been removed as a candidate for listing at this time.

SECTION TWO.
WILDLIFE HABITAT CRITICAL AREA BOUNDARY ESTABLISHMENT & DELINEATION

The first step in this delineation process is to review the mapping of the Airport Land Use Plan drawing from the Airport Layout Plan Drawing Set to evaluate how existing and future airport property is defined/allocated in the current MPU. A copy of the Airport Land Use Plan is presented for reference in Appendix Two. As can be noted, there are four (4) land use categories that have been identified on the Airport. These include:

- **Airport Operations Protected Area**
- **Runway Protection Zone/ADAP Non-Development Area**
- **Aviation Development Area**
- **Aviation-Related/Compatible Development Area**

The next step in the process of the critical area mapping for each of the protected species and their associated habitats is to incorporate the existing, future, and long-term development requirements of Airport, as defined by the *Airport Land Use Plan,* with the proposed Critical Area Habitat areas, as defined by WDFW[1]. Based upon the unique habitat characteristics/features and the required management protocols associated with each of the protected species, combined with the required maintenance and development practices of the Airport, three (3) separate Critical Area Habitats have been identified for consideration on the Airport, in accordance with previous WDFW habitat mapping categories (see detailed information below).

BOUNDARY ESTABLISHMENT

One of the benefits of this Critical Area Habitat boundary establishment proposal is that it defines a protocol that integrates the mapping/designation of the proposed Critical Area Habitats.

Another important aspect of the proposed Critical Area Habitat drawings is the differentiation of those areas that could be designated as “concurrent use of aeronautical property for other uses” vs. “interim use of aeronautical property for other uses” in accordance with the FAA compliance criteria as defined by FAA Order 5190.6B. This distinction is significant because the “concurrent use” property would represent those portions of the Critical Area Habitats that are unavailable for future aviation or aviation-compatible development, and thus could potentially be maintained indefinitely, as long as airport operational safety in not compromised. Therefore, a separate acreage total for each habitat designation was included above for reference.

[1] Mapping of the preliminary WDFW Habitat Management Area boundaries is presented in the Appendix Three of this document.

- Apply regulations from Airport Compliance Manual/FAA Order 5190.6B
    - "Concurrent Use" vs. "Interim Use" of aeronautical property for other purposes
    - Requires FAA approval
    - Facilitates Port compliance with FAA Grant Assurances
    - Establishes a protocol that integrates the mapping/designation of the proposed Critical Area Habitats with FAA approval of the Land Use Drawing from the Airport Layout Plan Drawing Set
    - No permanent Habitat Conservation Areas are to be established on airport property[2]
    - Airport Sponsor retains all future development rights of airport property

- "Concurrent Use" of aeronautical property for Critical Area Habitat
    - Could apply to areas that are unavailable for future aviation or aviation-compatible development
        - In-field areas (located adjacent to, and between runways and taxiways, but excludes runway safety areas and taxiway object free areas)
        - Runway Protection Zones

- " Interim Use" of aeronautical property for Critical Area Habitat
    - Could apply to areas that are available for aviation or aviation-compatible development
        - Future/long-term airside and landside development areas on the airport (e.g., connector taxiways, aircraft apron areas, aircraft storage and maintenance hangars, aviation-related businesses, aviation-compatible commercial/industrial development, etc.) that are offset from runway/parallel taxiway system

[2] There is an example of an FAA approved/funded Habitat Conservation Area for the California Least Tern (CLT) at San Diego International Airport. The CLT, which is a migratory species listed under both the Federal and California State Endangered Species Act, have nested in five (5) oval infield areas located between the runway and taxiways since 1970. The Airport Authority has implemented the CLT Protection Program at the Airport, in close coordination with USDA Wildlife Services that specifies guidelines for all airport tenant and contractor activities during the nesting season.

BOUNDARY DELINEATION (see Appendix Three for Critical Area Habitat mapping recommendations[3])

- Critical Area Habitat One (Mazama Pocket Gopher & Oregon Vesper Sparrow)
  - Total Area @ acreage to be determined
    - Concurrent Use Area @ acreage to be determined
    - Interim Use Area @ acreage to be determined

- Critical Area Habitat Two (Streaked Horned Lark)
  - Total Area @ acreage to be determined
    - Concurrent Use Area @ acreage to be determined
    - Interim Use Area @ acreage to be determined

- Critical Area Habitat Three (Butterflies & Prairie)
  - Total Area @ acreage to be determined
    - Concurrent Use Area @ acreage to be determined
    - Interim Use Area @ acreage to be determined

SECTION THREE.

U.S. DEPARTMENT OF AGRICULTURE (USDA) WILDLIFE SERVICES (WS) SAFETY ASSESSMENT/DETERMINATION OF WILDLIFE HABITAT CRITICAL AREA BOUNDARY

- Review of Critical Area Boundary Designation: Critical Area Habitats One, Two, & Three

- USDA WS provided preliminary Safety Determination for each of the originally proposed Critical Area Habitats for this planning memorandum. A follow-up Safety Determination evaluation will be conducted following USFWS's final recommendations for Critical Area Habitat delineation.
  - Initial determination is that proposed Critical Area Habitats would not compromise safety of Airport operations
  - USDA WS reserves right to periodically review the Critical Area Habitats for continued airport safety compliance

[3] Preliminary mapping recommendations for the Critical Area Habitats on the Airport were prepared for the preliminary version of this planning memo. However, following USFWS's proposed listing of the streaked horned lark, Taylor's checkerspot, and Mazama pocket gopher in late 2012, which included recommendations for critical area habitat boundaries that differed from those originally proposed by WDFW, it was determined that the mapping recommendations associated with this memo would be delayed pending the final USFWS listing for the three species.

- USDA WS reserves right to modify or change the Critical Area Habitat boundaries to promote airport safety compliance

- Wildlife Hazard Assessment (WHA) requirement
  - A WHA project is included in the 5-year Development Plan Project List (2015) for the Airport

- Wildlife Hazard Management Plan (WHMP) requirement
  - The findings of the WHA will determine whether a follow-on WHMP will be required

SECTION FOUR.
WILDLIFE HABITAT CRITICAL AREA ON-SITE MANAGEMENT APPROACH

This section provides the following information: 1) a list of documents that have been produced that provide management approaches, recommendations, and best management practices for maintaining and enhancing habitat for protected species and habitats identified on Table 1; and 2) a summary of information from these documents for maintaining and enhancing habitat for protected species on Airport property.

PREVIOUS MANAGEMENT APPROACH DOCUMENTS SUMMARY

The following documents are in various stages of approval and implementation. They include documents that have been prepared by the Port, agreements by the Port and WDFW, and comment response letters prepared by WDFW. The management approaches cited below are included for information purposes only. However, they were referenced in preparation of the specific *Habitat Management Recommendations* for each of the proposed Critical Area Habitats. The source documents below can also be referenced for complete management details.

The following document was prepared by the Port for managing protected species and habitats on Airport property.

- *Olympia Regional Airport Draft Habitat Management Plan* (Port of Olympia 2006)
  - The Port has committed to working with state & federal agencies with a regulatory interest in these species to develop a habitat identification and protection strategy.
  - The Port has committed to assist WDFW and other resource agencies in monitoring the identified sensitive species.

- The Port has committed to provide airfield access to resource agency and conservancy personnel.
- The Port will closely coordinate SEPA and NEPA analysis on all Port construction and development projects.
- The Port will evaluate the establishment of a Candidate Conservation Agreement with Assurances once the process is fully developed with the USFWS.
- The Port will limit access to the identified habitat areas.
- The Port will work with the Federal Aviation Administration to ensure compliance with FAA Order 5190.6A, Airports Compliance Handbook.

The following document was previously agreed upon by the Port and WDFW for managing protected species and habitats on Airport property.

- *Interlocal Agreement for Protection and Mitigation of State Species of Concern at the Olympia Regional Airport* (WDFW 2008a)
  - The Port will work with the Federal Aviation Administration to ensure compliance with FAA Order 5190.6A, Airports Compliance Handbook.
  - The Port shall continue to maintain the approximately 8.6 acre parcel of land between Old Highway 99 and Bonniewood Drive SE as Mazama Pocket Gopher Habitat Conservation Area in addition to any future Mazama Pocket Gopher Habitat Conservation Area established as part of long range plans for the Airport.
  - The Mazama Pocket Gopher Habitat Conservation Area may be considered as part of a mitigation bank once established.
  - The Airport Five-Year Development Plan includes development projects that have been reviewed by the WDFW Prairie Science Team for potential impacts to the species identified in Table 1.
  - The Airport Five-Year Development Projects can continue as planned in accordance with the *WDFW Response to Five-Year Airport Map of Planned Activities* (WDFW 2008b). The requested Management Area for the streaked horned lark, vesper sparrow, and the requested butterfly and prairie habitat area will be preserved in accordance with the *WDFW Response to Five-Year Airport Map of Planned Activities* (WDFW 2008b) until a final resolution is achieved as part of the FAA sponsored Airport Master Plan Update.

- WDFW shall have authorization to trap pocket gophers in project areas and relocate them (or authorize a WDFW approved third party) without restriction. WDFW shall have authorization to monitor and survey pocket gopher habitat without restriction.
- This agreement will be referenced in the future Airport Master Plan Update mutually developed by the FAA, WDFW, and the Port.
- No change or addition to this Agreement shall be valid or binding upon either party unless such change or addition be in writing and agreed to by both parties.

WDFW identified management practices for maintaining and enhancing habitat for protected species on Airport property in the following response letters. Formal agreement with WDFW by the Port on these management practices have not occurred to date.

- *WDFW Response to the Olympia Regional Airport Draft Habitat Management Plan* (WDFW 2007)
  - Develop a consistent monitoring schedule for each species to identify where species reside on the property.
- *WDFW Response to Five-Year Airport Map of Planned Activities* (WDFW 2008b)

HABITAT MANAGEMENT RECOMMENDATIONS

In consideration of the various habitat management practices that are noted above, as well as the findings of the MPU and the habitat boundary delineation and establishment rationale that was described in Section Two of this outline, the following sections provide a listing of the recommended management approaches for each of the newly designated Critical Area Habitats. It should also be noted that these habitat management recommendations have not been coordinated or reviewed with State and Federal wildlife agencies (WDFW or USFWS) pending a final determination on the Federal listing of the Mazama Pocket Gopher and the Streaked Horned Lark.

Critical Area Habitat One: Mazama Pocket Gopher & Oregon Vesper Sparrow

- The Port will plant prairie mix grasses in association with any airport construction projects located outside of the runway and taxiway object free areas that involve seeding and fertilizing.
- In cooperation with the Airport, WDFW should conduct one complete gopher survey every 3 years, dependent on staff availability. The results of the inventory should be used to guide future management recommendations. Coordinate a cost sharing agreement with WDFW for conducting the surveys.

- To the extent practical, it is recommended that development projects throughout the Airport property (not including the NE boundary projects) be no greater than 40 meters in width and no closer than 200 meters from the established population (e.g. from any Airport boundary). Identified barriers to dispersing Mazama pocket gophers include:
    - Forested areas
    - Wet areas
    - Paved surfaces greater than or equal to 50 meters in width
    - Highly cultivated and manicured lawns
    - Inhospitable soil types
- In cooperation with the Airport, WDFW should conduct one complete Vesper sparrow nesting survey every 3 years in the months of June, July, and August (in coordination with streaked horned lark surveys) to determine reproductive success, number of territories and spatial use of the airport. The results of the inventory should be used to guide future management recommendations. Coordinate a cost sharing agreement with WDFW for conducting the surveys.

Critical Area Habitat Two: Streaked Horned Lark

- In cooperation with the Airport, WDFW should conduct a streaked horned lark inventory every 3 years over the four month nesting season to determine reproductive success, number of territories and spatial use of the Airport. Coordinate a cost sharing agreement with WDFW for conducting the surveys.
- The Port has adopted a standard airport mowing practice that keeps length to 6 to 8 inches above the ground to avoid destroying nests, or mow outside the nesting season.
- Mowing schedules in the Runway 17 Runway Protection Zone (RPZ) will be adjusted to mid-April, the second week in June, and the second week in August to accommodate the nesting and development cycle of the Streaked Horned Lark.
- The Port will continue a maintenance program to actively remove Scots broom from airport property.
- The Port will continue least toxic herbicide application for yellow nut sedge (*Cyperus esculentus*) that is performed two to three times per year and has resulted in stable Streaked Horned Lark populations in the quarantine area.

Once the yellow nut sedge is eradicated, the Port will establish a mowing schedule that keeps the grass length 6 to 8 inches above the ground in that area.

- The following management approach will be implemented for habitat within areas identified as streaked horned lark management areas:
    - Future development projects that include the construction of permanent structures less than or equal then 100 meters from known nesting sites must be evaluated for potential habitat impacts.
    - Within nesting areas, minimize impervious surface and retained or replant post activity a maximum of grass dominated habitat with few to no trees or woody shrubs (less than 10 percent cover).
    - Within nesting areas, maintain/encourage sparsely vegetated habitat with large patches dominated by relatively short annual grasses and native bunch grasses (3.9 to 13.3 inches tall on average).
    - Within nesting areas, do not plant sod forming (rhizomatous) grasses.
    - Within nesting areas, retain a high percent of bare, pervious surface.
- The Port will plant approximately 10 percent perennial forbs such as native lupine species (*Lupinus lepidus*) used as "base plants" in association with any airport construction projects located outside of the runway safety areas and taxiway object free areas that involve seeding and fertilizing.

Critical Area Habitat Three: Butterfly & Prairie

- The Port will plant native, local prairie grass and forb seeds that are available for commercial purchase in association with any airport construction projects located outside of the runway safety areas and taxiway object free areas that involve seeding and fertilizing.
- Mowing, to control invasive exotics like Scots broom, should be conducted as stipulated for the Streaked Horned Lark management zone. However, prairie/butterfly management zones need not be mowed if invasive exotic species are not a problem. Maintaining grass heights of 6 to 8 inches would reduce impacts to butterflies.
- In cooperation with the Airport, WDFW should conduct annual butterfly surveys per WDFW butterfly survey protocols:

- Three visits spaced throughout the flight period per species conducted under appropriate survey conditions (time of day, weather).
- Conducted over multiple years.

- WDFW butterfly survey protocols identify the following survey time periods:
  - Taylor's checkerspot – April 15 to May 31
  - Mardon skipper – May 1 to June 15
  - Puget blue – May 15 to June 30
  - Valley Silverspot – July 15 to August 31
- The results of the inventory should be used to guide future management recommendations. Coordinate a cost sharing agreement with WDFW for conducting the surveys.

SECTION FIVE.
WILDLIFE HABITAT CRITICAL AREA MITIGATION MEASURES APPROACH

This section provides a description of applicable regulations associated with species and habitats on the Airport, a description of species habitat requirements and prairie priority habitat, and the mitigation approach to be implemented for species and habitats when specific project activities are identified and proposed.

FEDERAL, STATE, AND LOCAL REGULATIONS

Species and habitats on the Airport property are protected under federal (USFWS), state (WDFW), and local (City of Tumwater) regulations. WDFW and City of Tumwater permit requirements include mitigation measures for addressing impacts to protected species and habitats. The mitigation approach described in this section applies specifically to WDFW and City of Tumwater regulations.

Federal regulations (the Endangered Species Act [ESA]), do not identify mitigation measures for impacts to listed species and habitats. Potential mitigation activities are described in an ESA analysis as a component of proposed project activities, but compliance with ESA does not include prescribed mitigation. Following is a summary of the ESA process for reference.

Section 7(a)(1) of the ESA of 1973, as amended, (16 U.S.C. 1531 et seq.) requires federal agencies to protect endangered and threatened species. Section 7(a) (2) requires federal action agencies

to conduct ESA consultations to ensure that any action with a federal nexus, (authorized, funded, or carried out by a federal agency) will not jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitats.

Under ESA compliance, a Biological Assessment or Biological Evaluation document is prepared and submitted to the USFWS describing the proposed action and the potential impacts and effect determination for listed or proposed species or critical habitats.

The lead federal agency may initiate either formal or informal consultation with the USFWS. Formal consultations are those where an analysis of the project determines that the project is Likely to Adversely Affect (LTAA) a listed species. During formal consultation, the USFWS and the lead agency share information about the proposed project and the species likely to be affected. Formal consultation may last up to 90 days, after which USFWS will prepare a biological opinion on whether the proposed activity will jeopardize the continued existence of a listed species. The USFWS has 45 days after completion of formal consultation to write the opinion. The biological opinion document defines the potential impacts and identifies reasonable and prudent measures, terms and conditions, and conservation measures such as construction BMP's, species monitoring criteria, and construction timing restrictions. The reasonable and prudent measures, terms and conditions, and conservation measures identified in a biological opinion may be similar to what is described in the Biological Assessment or it may identify additional measures to be incorporated into a project to protect species and habitats. Informal consultations are those where an analysis determines the project is Not Likely to Adversely Affect (NLTAA) listed species. If the USFWS concur with a NLTAA determination, the informal consultation is complete and the proposed project moves ahead. Overall, the formal consultation process involves more coordination with the agencies, preparation of a biological opinion, and has a longer timeline to completion than informal consultation.

For species that are proposed for ESA listing, formal ESA conferencing is required for federal actions likely to jeopardize the continued existence of proposed species or adversely modify proposed critical habitat. The lead federal agency may request a formal conference for a project that warrants a conditional effects determination of LTAA for proposed species or critical habitat. The lead federal agency may request informal conference for projects when a species listing is imminent and the effects analysis concludes that a provisional NLTAA is appropriate.

A summary of regulations associated with protected species and habitats on the Airport property is presented in Table 2.

Table 2

Summary of Regulations Associated with Protected Species and Habitats Known to Occur or Potentially Exist within the Airport Property

Jurisdiction/ Agency	Regulations	Applicable Species and Habitats	Permits
City of Tumwater	TMC (16.32.050): Protection of endangered, threatened, and sensitive species and habitats (as identified by WDFW).	Mazama pocket gopher, streaked horned lark, Taylor's checkerspot, and mardon skipper species, and habitats.	Habitat Protection Plan (defers to WDFW for expertise, concurrence, and recommendations).
City of Tumwater	TMC (16.32.055): Protection of locally significant species and habitats (not State-listed but of special importance).	Oregon vesper sparrow, Puget blue, and valley silverspot species, and habitats.	Habitat Protection Plan (defers to WDFW for expertise, concurrence, and recommendations).
City of Tumwater	City of Tumwater Conservation Plan (2005): Protection of Fish and Wildlife Conservation Areas.	All species and habitats identified in Table 1.	Habitat Protection Plan per TMC.
WDFW	RCW 77.15.120: Protection of State-listed species from take (does not protect habitat).	Mazama pocket gopher, streaked horned lark, Taylor's checkerspot, and mardon skipper species.	Habitat Protection Plan per TMC.
WDFW	PHS List: WDFW species and habitat priorities for conservation, preservation, and management.	All species and habitats identified in Table 1.	Habitat Protection Plan per TMC.
WDFW	Management Recommendations for Washington's PHS	All species and habitats identified in Table 1.	Not regulatory. Species and site-specific management recommendations.
WDFW	WDFW and Port of Olympia Interlocal Agreement (2008): Document identifying protection and mitigation of state species and habitats on Airport property.	All species and habitats identified in Table 1.	Establishment of Habitat Conservation Areas on Airport property and potential future mitigation banking.
USFWS	Section 7 of ESA 50 CFR 17: Protection of federally listed or proposed species and critical habitats.	Streaked horned lark and Mazama pocket gopher are proposed threatened species and Taylor's checkerspot is a proposed endangered species. Critical habitat is proposed for each of these species.	Consultation with USFWS if any threatened, endangered, or proposed species or habitats may be affected by a project. Candidate species and species of concern have no protection under the ESA.

Jurisdiction/ Agency	Regulations	Applicable Species and Habitats	Permits
USFWS	Migratory Bird Treaty Act 50 CFR 21	Streaked horned lark and Oregon vesper sparrow species.	Prohibits the taking, killing, or possession of migratory birds.
The Nature Conservancy, WDFW, WDNR, USFWS	Non-governmental and agency working group.	Prairie habitat and associated species.	Not regulatory. Conservation and management needs of prairie habitat.

Notes:

Airport = Olympia Regional Airport
CFR = Code of Federal Regulations
ESA = Endangered Species Act
PHS = Priority Habitats and Species
RCW = Revised Code of Washington
TMC = Tumwater Municipal Code
USFWS = U.S. Fish and Wildlife Service
WDFW = Washington Department of Fish and Wildlife
WDNR = Washington Department of Natural Resources

DESCRIPTION OF SPECIES HABITAT REQUIREMENTS AND PRIORITY PRAIRIE HABITAT

Critical Area Habitat One: Mazama Pocket Gopher & Oregon Vesper Sparrow

MAZAMA POCKET GOPHER HABITAT REQUIREMENTS

Preferred habitat for pocket gophers is prairie land with short, native grasses, and a deep, well-developed soil profile with good drainage and low levels of soil rockiness. Their populations typically exhibit a very patchy distribution, due largely to a naturally patchy distribution of the soil and vegetation properties that they prefer (USFWS 2002). While there is fairly limited information on pocket gopher dispersal, it is thought that individuals have a home range of approximately 1,600 square feet, with individual forages of over 3,200 feet to search for more favorable habitat conditions (Nowak 2003).

Beneficial herbaceous plants associated with gopher habitat include legumes, broadleaf forbs, and grasses such as broadleaf lupine (*Lupinus latifolius*), clover (*Trifolium* sp.), nodding onion (*Allium cernuum*), common yarrow (*Achillea millefolium*), field chickweed (*Cerastium arvense*), showy fleabane (*Erigeron speciosus*), coast strawberry (*Fragaria chiloensis*), and blue wildrye *(Elymus glaucus*) (WDFW 2011).

The *Mazama Pocket Gopher Occupancy Modeling* study funded by the Army Compatible Use Buffer Program (ACUB) and conducted by WDFW concluded that soil types may be considered as

a first indicator of whether sites might be occupied (or suitable for occupation) by gophers. Other screening factors include Scots broom cover or density, woody shrub cover, and fall vegetation height.

The following soil types are most commonly associated with Mazama pocket gopher habitat:

- Cagey loamy sand
- Everett very gravelly sandy loam, 0-3%
- Everett very gravelly sandy loam, 3-15%
- Indianola loamy sand, 0-3%
- Indianola loamy sand, 3-15%
- Nisqually loamy fine sand, 0-3%
- Nisqually loamy fine sand, 3-15%
- Spana gravelly loam
- Spanaway gravelly sandy loam, 0-3%
- Spanaway gravelly sandy loam, 3-15%
- Spanaway stony sandy loam, 0-3%
- Spanaway stony sandy loam, 3-15%
- Spanaway-Nisqually complex

OREGON VESPER SPARROW HABITAT REQUIREMENTS

The Oregon vesper sparrow's preferred habitat is grasslands. Oregon vesper sparrows are ground-nesting and ground-foraging birds with nesting habitat requirements including elevated perches for singing and a grass-dominated understory for foraging and nesting. They are associated with grass heights of 6 to 12 inches and have territories of about 3 acres (Altman 1999). Vegetation in Oregon vesper sparrow territory is grass dominated (58 to 88 percent cover) with bare ground (6 to 32 percent), forbs (0 to 20 percent), and shrubs/trees (6 percent) (Rogers 2000).

Critical Area Habitat Two: Streaked Horned Lark

STREAKED HORNED LARK HABITAT REQUIREMENTS

Horned larks are birds of wide open spaces with no trees and few or no shrubs. They do not seem to be associated with any specific vegetation type and strongly prefer bare ground to

vegetation that is more than several inches tall (Altman 1999, Rogers 2000, Pearson and Hopey 2005). The streaked horned lark nests on the ground in sparsely vegetated sites dominated by grasses and forbs. Today the streaked horned lark nests in a broad range of habitats, including native prairies, coastal dunes, fallow and active agricultural fields, wetland mudflats, sparsely-vegetated edges of grass fields, recently planted Christmas tree farms with extensive bare ground, moderately- to heavily-grazed pastures, gravel roads or gravel shoulders of lightly-traveled roads, airports, and dredge deposition sites in the lower Columbia River. Wintering streaked horned larks use habitats that are very similar to breeding habitats.

A key attribute of habitat used by larks is open landscape context. Sites used by larks are generally found in open (i.e., flat, treeless) landscapes of 300 acres or more. Some patches with the appropriate characteristics (i.e., bare ground, low stature vegetation) may be smaller in size if the adjacent fields provide the required open landscape context. Streaked horned larks are found at many airports within the range of the subspecies; as native prairies and scoured river beaches in the Pacific Northwest have declined, airports, with their large area requirements and treeless settings, have become magnets for streaked horned larks (USFWS 2012b).

Critical Area Habitat Three: Butterfly & Prairie

TAYLOR'S CHECKERSPOT HABITAT REQUIREMENTS

Taylor's checkerspot butterflies occupy open habitat dominated by grassland vegetation. In the south Puget Sound region they inhabit glacial outwash prairies and shallow-soil balds (a bald is a small opening on slopes in a treeless area, dominated by herbaceous vegetation) (Federal Register 77, No. 197). Females emerge in the spring and lay eggs on host plants of the family Scrophulariaceae, which are often specific to sites (or populations); these include harsh paintbrush (*Castilleja hispida*), marsh speedwell (*Veronica scutellata),* American brooklime *(V. beccabunga*), and non-natives including plantains (*Plantago lanceolata* and *P. major*) and thyme-leaved speedwell (*V. serpyllifolia ssp. serpyllifolia*). When the caterpillars emerge, they depend on these primary host species for food until early summer, when they enter an inactive diapause stage. Emerging from diapause in late winter, the caterpillars feed more broadly on the primary hosts and other post-diapause food plants that may be available, including sea blush (*Plectritis congesta*), blue-eyed Marys (*Collinsia parviflora* and *C. grandiflora*), and dwarf owl-clover (*Triphysaria pusilla*) (WDFW 2012b).

MARDON SKIPPER HABITAT REQUIREMENTS

The Mardon skipper butterfly is dependent upon grassland habitats dominated by native grass species. Occupied habitats are typically isolated small meadows surrounded by miles of forest, with no apparent connectivity for dispersal between local populations (Kerwin and Huff 2007). In this South Puget Sound, the species is found in open, glacial outwash grasslands with

abundant Roemer's fescue (*Festuca roemeri*) interspersed with early blue violet (*Viola adunca*) (Potter et al. 1999). On these prairies, adults feed on nectar from a variety of herbaceous plants. Early blue violet and common vetch (*Vicia sativa*) are strongly preferred as nectar sources and Scots broom is strongly avoided (Hays et al. 2000). Nectaring has also been observed on common camas (*Camassia quamash*), prairie lupine (*Lupinus lepidus*), fine-leaved desert parsley (*Lomatium utriculatum*), western buttercup (*Ranunculus occidentalis*), sea blush, and common yarrow (WDFW 2012c).

PUGET BLUE HABITAT REQUIREMENTS

The Puget Blue butterfly habitat in Washington includes forest clearings with a presence of lupine (*Lupinus spp.*), Puget lowland prairies and their forest edges, powerline cuts, and unsprayed railroad rights-of-way. Known host plants for this Washington endemic include broadleaf lupine (*Lupinus latifolius*) and probably other lupine species (WDFW 1995).

VALLEY SILVERSPOT HABITAT REQUIREMENTS

The valley silverspot butterfly uses open prairies, arctic-alpine tundra, subalpine glades, and mid-elevation roadsides and clearings. The only known host plant is the western blue violet (*Viola adunca*) (WDFW 1995).

PRAIRIE HABITAT DESCRIPTION

WDFW defines priority prairie habitat as herbaceous, non-forested (less than 60 percent forest canopy cover) plant communities that can either take the form of a dry prairie where soils are well-drained or a wet prairie (WDFW 2008c).

Certain soils and vegetation characteristics typify dry prairie (WDFW 2008c). Vegetation includes the occurrence of grasses, sedges, and forbs. Mosses, lichens, and bare ground may also be found in the spaces between grass and forb cover. Prairie can sometimes be recognized by mounded topography. The presence of certain diagnostic plants is required to establish an occurrence of dry prairie. In particular, three of the diagnostic grasses, sedges, or forbs are required. Shrubs such as black hawthorn (*Crataegus douglassii*), kinnikinnick (*Arctostaphylos uvaursi*), and oval-leaf viburnum (*Viburnum ellipticum*) can be found at low densities within prairie. Some Oregon white oak (*Quercus garryana*) can also be present in native prairie (WDFW 2008c).

Native and nonnative invasive plants typically dominate most remaining prairie. Common invasives are Scots broom, Colonial bentgrass (*Agrostis tenuis*), common velvetgrass (*Holcus lanatus*), tall oat-grass (*Arrhenatherum elatius*), and Kentucky bluegrass (*Poa pratensis*). Other invasive grasses, forbs, and shrubs also can be present (WDFW 2008c).

MITIGATION APPROACH

This section describes the components of a multi-tiered mitigation approach for protected species and habitats within the Airport property in compliance with WDFW and the City of Tumwater regulations. When future projects are proposed with appropriate details to initiate the permitting process and to quantify impacts to protected species and habitats, the following mitigation approach can be implemented. The following mitigation approach can be applied for impacts to individual species or all species and habitats on the Airport property identified in Table 1. WDFW has established protocols for monitoring on-site and off-site mitigation activities and performance standards for evaluating the effectiveness of mitigation sites for the species and habitats identified in Table 1. WDFW approved mitigation protocols would be implemented under any of the following mitigation approach options.

General Mitigation Approach for Species and Habitats

TIER 1: AGENCY COORDINATION AND IMPACT DEFINITION

The project proponent and Airport representatives will coordinate with WDFW and the City to evaluate any design opportunities to minimize any potential impacts and then assess potential impacts to protected species and habitats and identify appropriate mitigation measures, compensatory ratios for disturbed habitat, surveys for quantifying species presence, monitoring efforts, etc. The Airport will work with WDFW to use their accepted protocols for mitigation monitoring and survey efforts.

TIER 2: ON-SITE MITIGATION OF EXISTING SUITABLE HABITAT

Evaluate whether areas of the Airport with existing suitable prairie habitat where development is not anticipated as permanent mitigation/conservation areas (e.g., the existing 8.6 acre Mazama Pocket Gopher Habitat Conservation Area that is documented in the existing Interlocal Agreement) can be established for the protection of the species. However, as described in Section Two of this draft agreement outline, it is recommended that the existing Gopher Habitat Conservation Area be re-designated as Critical Area Habitat One/Concurrent Use Area to comply with regulations from Airport Compliance Manual/FAA Order 5190.6B.

TIER 3: ON-SITE MITIGATION BY ENHANCING HABITAT

Evaluate whether areas of the Airport with existing poor or unsuitable prairie habitat where development is not anticipated could be enhanced for habitat or creation as permanent mitigation/conservation areas and potential species relocation. However, in accordance with regulations from Airport Compliance Manual/FAA Order 5190.6B, it is recommended that no on-site enhancement of habitat be proposed to support habitat mitigation efforts.

TIER 4: OFF-SITE MITIGATION OF EXISTING SUITABLE HABITAT

Evaluate acquiring off-site property currently containing suitable prairie habitat for permanent mitigation/conservation areas and potential species relocation. Several organizations in Thurston County are documenting, prioritizing, acquiring, and managing prairie habitat for preservation. These organizations can serve as a source of information of available off-site mitigation areas, reducing the level of effort by the Airport to identify mitigation areas. A description of these organizations is provided in the Tier 6 section below. The Airport would work with WDFW and other interested parties to explore feasible off-site mitigation opportunities and will use WDFW accepted protocols for mitigation monitoring and survey efforts.

WDFW recommends that Mazama Pocket Gopher off-site mitigation ratios should be calculated at a rate of three acres of suitable habitat permanently protected for every one acre of occupied gopher habitat destroyed (WDFW 2011). WDFW has not currently established mitigation ratios for the other species and habitats identified in Table 1.

TIER 5: OFF-SITE MITIGATION BY ENHANCING HABITAT

Evaluate acquiring off-site property containing poor or unsuitable prairie habitat for enhancement or creation of suitable habitat for permanent mitigation/conservation areas and potential species relocation. The Airport would work with WDFW and other interested parties to evaluate these properties using the latest science to determine if habitat in these off-site areas could be enhanced to make the habitat viable for the species.

TIER 6: MITIGATION THROUGH FUNDING EXISTING PRAIRIE HABITAT AND SPECIES CONSERVATION ACTIVITIES

Evaluate providing funds to existing conservation efforts to protect and preserve existing prairie habitat and associated species. Several active organizations in Thurston County comprising public, private, or a combination of both entities are prioritizing, acquiring and managing prairie habitat for preservation. Collaborating with existing preservation activities would significantly reduce the Airports level of effort in identifying off-site mitigation opportunities. Preliminary contact has been made with several organizations as part of this analysis and they encourage the involvement of additional stakeholders. Organizations involved in prairie habitat preservation in Thurston County that have been contacted as part of this analysis include the following:

- **Army Compatible Use Buffer Program (ACUB):** This program creates land conservation partnerships to protect land from development that is incompatible with military missions at Army installations. Joint Base

Lewis McChord (JBLM) military base is a participant in the ACUB program specifically targeted at preserving the unique Puget Sound lowland prairies ecosystem. One study funded by ACUB is the *Mazama Pocket Gopher Occupancy Modeling*, conducted by WDFW. ACUB prairies evaluated for probability of site occupancy in this study included: Scatter Creek, Wildlife Area (North and South units), West Rocky Wildlife Area, Rocky Prairie NAP, Mima Mounds Natural Area, Glacial Heritage Preserve, and Tenalquot Preserve. This study concluded that soil types may be considered as a first indicator of whether sites might be occupied (or suitable for occupation) by gophers. Other screening factors include Scots' broom (*Cytisus scoparius*) cover or density, woody shrub cover, and fall vegetation height. In addition, FAA AC 150/5200.33B, *Hazardous Wildlife Attractants On or Near Airports*, provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. The FAA recommends a minimum separation of 10,000 feet for airports used by turbine-powered aircraft, and a distance of five statute miles for all airports if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace. The proximity/relationship of the Airport to the area ACUB prairie/gopher sites and the referenced wildlife hazard separation boundaries is presented in Appendix Four (see Figure 5).

- **USDA Natural Resource Conservation Service (NRCS) South Sound Prairie Restoration Project:** Stakeholders in this project include Washington Department of Natural Resources (DNR), WDFW, USFWS, The Nature Conservancy (TNC), Fort Lewis, and Thurston County.
- **Thurston County Prairie Conservation:** The Thurston County Planning Department is working with the USFWS on a Habitat Conservation Plan for prairie conservation. The HCP is identifying all properties within Thurston County that are appropriate for prairie conservation, restoration, or enhancement. The HCP is currently 2 to 3 years from completion. That information will be available for public use and the County will work with interested parties on sharing information before the HCP is complete.
- **TNC:** In addition to being a stakeholder in the South Sound Prairie Restoration Project, TNC has ongoing research on prairie restoration in southern Puget Sound.
- **Center for Natural Lands Management (CNLM):** CNLM is known for superior stewardship of natural lands and rare species in Washington. CNLM works

with the South Sound Prairie Program, TNC, and Fort Lewis on prairie conservation. A primary strategy for the Center is to conserve important lands as part of development mitigation. The Center can hold lands in fee, support a conservation easement or conduct long-term management on a contract basis. The Center is a leader in assessing the long-term land management needs of a project and the costs needed to maintain the conservation values in perpetuity.

Example Mitigation Approach for Species and Habitats at Sanderson Field (City of Shelton/Mason County, Washington)

As an example of applying the multi-tiered mitigation approach that is described above, WDFW coordinated the following approach to minimize direct and indirect effects on pocket gophers and their habitat as part of the Sanderson Field Airport Habitat Management Plan [i.e., *Revised Comprehensive Habitat Management Plan for the Shelton Pocket Gopher (Thomomys mazama couchi) at Sanderson Field Shelton, Washington* (Port of Shelton 2003)]. Information from this document is provided as reference to an approach to gopher management, approved by WDFW, for a regional airport with similar habitat and species considerations as those found at Olympia Regional Airport. The individual steps of that approach are presented in the following text.

- **Quantify habitat loss and potential pocket gopher population affected.** Prior to any development, the Port should quantify the amount of habitat that will be affected by the project. At that time, the Port should also conduct a pre-construction survey of the immediate area, using a mound-count technique, to get an indication of the size of the pocket gopher population potentially affected. This step will allow the Port to prepare the necessary paperwork and initiate the permitting process with the county. If the site is found to contain no active mounds during the initial survey, the Port should document that the area is not active gopher habitat and request authorization to begin development without further mitigation. If the site does contain active mounds, the Port should proceed with the mitigation measures described below.
- **Create new habitat.** The Port should enhance and permanently protect from development an area at least the same size as the development area that contains Mazama pocket gophers or is in close proximity to an occupied site. This may be a site within the Airport[4], other Port property, or a newly purchased site to serve this purpose (e.g. mitigation bank). If

[4] As noted in previous sections, Tier 4 and Tier 5 off-site mitigation is recommended for all future habitat mitigation on Olympia Regional Airport.

this site contains native prairie, follow maintenance guidance. If it does not, the Port should begin enhancing this area by clearing any wooded areas, removing Scots broom (*Cytisus scoparius*) and other invasive brush, and disking the soil to create favorable soil conditions. In some cases, simply mowing will keep the Scots broom from dominating, but will not negate its nitrogen-fixing capabilities. Several studies have shown that the presence of excess soil nitrogen can negatively affect success of native prairie restoration efforts.

- **Construction BMPS.** Where appropriate, the Port should consider use of temporary fencing to keep foot and vehicle traffic to a minimum, as well as runoff controls to minimize the surface runoff into nearby habitat areas. In addition, the Port should minimize construction activity near dawn and dusk (or within 30 minutes of sunrise or sunset), times when pocket gophers are known to be most active.
- **Document activities with site-specific letter Habitat Management Plan (HMP).** The Port should detail the specifics of the development activity and mitigation measures in a letter to the City and County that references this comprehensive habitat management plan.
- **Monitor habitat use.** The Port should implement an ongoing monitoring program to verify that any newly created habitat is being occupied by pocket gophers at approximately the same density as was found in the original habitat area.
- **Further Recommendations.** In areas where new habitat is some distance from old habitat, the Port should ensure that corridors between habitat patches exist. For example, culverts could be used to provide a safe dispersal route to the main restoration area. While an underpass would be preferable to a culvert, research indicates that small mammals regularly use culverts of between 1.3 and 3.6 feet in diameter to cross busy roads. We therefore recommend a culvert of at least 3 feet in diameter with an open bottom to encourage its use by pocket gophers.

SECTION SIX.
MASTER PLAN UPDATE DEVLEOPMENT PROJECT IMPACT ASSESSMENT FOR WILDLIFE HABITAT CRITICAL AREA

One of the components of the existing 2008 Interlocal Agreement between the Port of Olympia and WDFW included an attachment of the "Airport Five-Year Development Plan", which

provided a listing of projects that were reviewed by the WDFW Prairie Science Team for potential impacts to the specified wildlife species and habitats on the Airport. It should be noted that a new project list and phasing plan has been prepared for the current MPU, and a project impact assessment version of these tables, which includes data entries for estimated affected habitat and acreages, has been included for reference (see below). Other factors that will be considered on a project specific basis will include construction staging areas and Special Event planning (e.g., Air Show parking & viewing areas). In addition, two illustrations have been prepared (see Figures 6 and 7 in Appendix Five) to graphically identify the limits of the current MPU projects relative to the *Airport Land Use Plan* drawing, as well as to the boundary of 2008/5-year construction projects that defined where projects were previously approved for development. As can be noted on the illustrations, most of the current MPU projects also fall within the previous boundaries of the 2008 Approved Development Area.

Table 3

Phase I (0-5 Years) Development Plan Projects Potential Mitigation Requirements

	Project Description	Affected Habitat	Total Project Area (acres)	Habitat Impact Area (acres)[1]
	2013 Projects			
A.1	Airport Master Plan Update (2011 Carryover)	None	N.A.	---
A.2	Rehabilitate Taxiway "C", North "W", and Terminal Connector, Including Pavement Removal, Reflectors, Signage, Lighting, and Segment Circle Relocation	G/S, L	4.7	T.B.D.
A.3	Rubber Removal and Paint Runway 17/35	None	N.A.	---
A.4	Hangar D Gutter Replacement	None	N.A.	---
A.5	Overlay Hangar F Taxilane	None	N.A.	---
A.6	Hangars A, B, C Roofs, Gutters, Siding	None	N.A.	---
A.7	Reconstruct Glacier FBO Generator Shack	None	N.A.	---
A.8	Glacier FBO Sewer Connect	None	N.A.	---
A.9	Purchase Snow Plow for Maintenance Work Truck	None	N.A.	---
	2014 Projects			
A.10	Rehabilitate Taxiway "F" North of Runway 8/26	None	N.A.	---
A.11	Rehabilitate/Seal Coat Hangars A, B, and C Taxilanes	None	N.A.	---
A.12	WSP Hangar Electrical Rehabilitation	None	N.A.	---
A.13	Plane Port Roof Rehabilitation	None	N.A.	---
A.14	Hangar F Gutter Replacement	None	N.A.	---
A.15	Implement Critical Areas Mitigation Measures	None	N.A.	---
A.16	Purchase New Zero Turn Power Riding Mower	None	N.A.	
	2015 Projects			
A.17	Conduct Wildlife Hazard Assessment (Contingency)	None	N.A.	---
A.18	Design Service Road Rehabilitation	None	N.A.	---
A.19	Overlay/Seal Coat Hangar G Taxilane	None	N.A.	
A.20	7600 Terminal Street Hangar Siding	None	N.A.	
A.21	Hangar F Roof and Gutter	None	N.A.	
A.22	Hangar D Roof	None	N.A.	
	2016 Projects			
A.23	Construct Service Road Rehabilitation	None	N.A.	---
A.24	Overlay Runway 08/26 and Reduce Width to 75 Feet	None	N.A.	
A.25	Install Runway 26 Precision Approach Path Indicator (PAPI) Lights	G/S, L	0.1	T.B.D.
A.26	Rehabilitate/Seal Coat Hangar E Taxilane	None	N.A.	
A.27	Hangar G Roof and Gutter	None	N.A.	
A.28	Purchase New Maintenance Pickup Truck With Snow Plow	None	N.A.	

Notes: G/S = Mazama Pocket Gopher & Oregon Vesper Sparrow Habitat
L = Streaked Horned Lark Habitat
B = Prairie and Butterfly Habitat
[1] Area to be determined by on-site survey.
N.A. = Not Applicable T.B.D. = To Be Determined

Table 3 (Continued)

Phase I (0-5 Years) Development Plan Project Potential Mitigation Requirements

	Project Description	Affected Habitat	Total Project Area (acres)	Habitat Impact Area (acres)[1]
	2017 Projects			
A.29	Preliminary Design Taxiway "F" Realignment and Rehabilitation	None	N.A.	
A.30	Rehabilitate Taxiway "A" From Intersection With Taxiways "W" and "B", to Old Runway 17 Threshold	None	N.A.	
A.31	Acquire Tree Easement and Remove Obstructions Within the Runway 26 Approach Area	None	N.A.	
A.32	Construct Helipad and Implement Final Approach and Takeoff Area (FATO)	G/S, L	1.2	T.B.D.
A.33	Design Southeast GA Vehicle Access Road	None	N.A.	

Notes: G/S = Mazama Pocket Gopher & Oregon Vesper Sparrow Habitat
L = Streaked Horned Lark Habitat
B = Prairie and Butterfly Habitat
[1] Area to be determined by on-site survey.
N.A. = Not Applicable T.B.D. = To Be Determined

Table 4

Phase II (6-10 Years) Development Plan Project Potential Mitigation Requirements

	Project Description	Affected Habitat	Total Project Area (acres)	Habitat Impact Area (acres)[1]
B.1	Construct Taxiway "F" Realignment and Rehabilitation	G/S, L	3.6	T.B.D.
B.2	Install Taxiway Lighting on Taxiway "E"	G/S, L	3.7	T.B.D.
B.3	Construct Southeast GA Vehicle Access Road	None	N.A.	
B.4	Update Airport Airspace Analysis Survey for Runway 26 GPS (LPV) Instrument Approach Procedure (IAP)	None	N.A.	
B.5	Conduct Environmental Assessment (EA) for Runway 26 GPS (LPV) IAP	None	N.A.	
B.6	Remark Runway 26 With Non-Precision Markings and Install Medium Intensity Runway Lights (MIRL)on Runway 08/26	None	N.A.	
B.7	Purchase 9030 Airport Mower Deck			
B.8	Construct T-hangar, Including Taxilanes and Automobile Access/Parking	G/S	1.5	T.B.D.
B.9	Construct Corporate Hangars, Including Automobile Access/Parking	G/S	0.3	T.B.D.
B.10	Construct Corporate Hangar, Including Automobile Access/Parking	G/S	0.1	T.B.D.
B.11	Taxiway Pavement Rehabilitation	None	N.A.	
B.12	Roadway Pavement Rehabilitation	None	N.A.	
B.13	Implement Critical Areas Mitigation Measures	None	N.A.	
B.14	Purchase New Operation Pickup Truck With Snow Plow	None	N.A.	
B.15	Terminal Expansion and Rehabilitation (Contingent on Tenant)	G/S	0.8	T.B.D.
B.16	Overlay Terminal Ramp	None	N.A.	
B.17	Overlay Fuel Farm Access Road	None	N.A.	
B.18	Conduct EA for Runway 35 GPS (LPV) IAP	None	N.A.	
B.19	Purchase Two Parcels (Approximately 6.8 Acres) of Property Within and Adjacent to the Runway 35 Runway Protection Zone (PRZ)	None	N.A.	
B.20	Remark Runway 35 With Precision Markings	None	N.A.	

Notes: G/S = Mazama Pocket Gopher & Oregon Vesper Sparrow Habitat
L = Streaked Horned Lark Habitat
B = Prairie and Butterfly Habitat
[1] Area to be determined by on-site survey.
N.A. = Not Applicable T.B.D. = To Be Determined

Table 5

Phase III (11-20 Years) Development Plan Project Potential Mitigation Requirements

	Project Description	Affected Habitat	Total Project Area (acres)	Habitat Impact Area (acres)[1]
C.1	Construct Runway 08/26 North Side Partial Parallel Taxiway From Taxiway "F" to Runway 17/35, Including MITL and Signage	G/S, L	1.0	T.B.D.
C.2	Construct Taxiway "F" From Taxiway "G" to Runway 08/26 North Side Partial Parallel Taxiway, Including Pavement Removal, Reflectors, and Signage	G/S, L	1.6	T.B.D.
C.3	Construct T-hangar, Including Taxilanes and Automobile Access/Parking	G/S	2.1	T.B.D.
C.4	Construct Corporate Hangars, Including Automobile Access/Parking	G/S	3.2	T.B.D.
C.5	Construct Runway 08/26 North Side Partial Parallel Taxiway From Taxiway "F" to Runway 26 Threshold, Including Reflectors and Signage	G/S, L	2.4	T.B.D.
C.6	Construct Taxiway "F" From Taxiway "C" to Runway 08/26 North Side Partial Parallel Taxiway, Including Reflectors and Signage	G/S, L	1.0	T.B.D.
C.7	Update Airport Airspace Analysis Survey fro Runway 17 Runway Visual Range (RVR) and/or Require Navigation Performance (RNP) IAP	None	N.A.	
C.8	Runway 08/26 Pavement Rehabilitation	None	N.A.	
C.9	Runway 17/35 Pavement Rehabilitation	None	N.A.	
C.10	Taxiway Pavement Rehabilitation	None	N.A.	
C.11	Roadway Pavement Rehabilitation	None	N.A.	
C.12	Install Runway 17 Touchdown Zone (TDZ) RVR Sensor, TDZ Lights, and Runway Centerline Lights (RCL)	None	N.A.	
C.13	New Hangar Roof D	None	N.A.	
C.14	Purchase Index A Airport Rescue Fire Truck (Contingent on Commercial Air Service)	None	N.A.	
C.15	Replacement Fencing – Old Highway 99 South	None	N.A.	
C.16	Acquire Tree Easement and Remove/Trim Obstructions Within the Runway 35 Approach Area	None	N.A.	
C.17	Rehabilitate Taxiway "W" From Taxiway "L" to Taxiway "B"	None	N.A.	
C.18	Install MALSR and Publish GPS (LPV) IAP to Runway 35	G/S, B	5.5	T.B.D.
C.19	Construct T-hangar, Including Taxilanes and Automobile Access/Parking	G/S	1.5	T.B.D.
C.20	Construct Corporate District Access Road	G/S	0.5	T.B.D.
C.21	Construct T-hangar, Including Taxilanes and Automobile Access/Parking	G/S	1.0	T.B.D.
C.22	Construct Fire Rescue Gate to Old Highway 99 (Contingent on Road Reconstruction)	None	N.A.	
C.23	Construct City/Port Joint Use Fire Station	G/S	5.7	T.B.D.

Notes: G/S = Mazama Pocket Gopher & Oregon Vesper Sparrow Habitat
L = Streaked Horned Lark Habitat
B = Prairie and Butterfly Habitat
[1] Area to be determined by on-site survey.
N.A. = Not Applicable T.B.D. = To Be Determined

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APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

Supplemental Planning Memorandum

Date: March 11, 2013

To: Rudy Rudolph, Port of Olympia Airport Director
Olympia Regional Airport

From: Cody Fussell/Aviation Services
Mead & Hunt, Inc.

Reference: Olympia Regional Airport/Critical Areas (Priority Habitats and Species) Environmental Inventory

Introduction

Due to specific environmental issues related to the existence of priority habitat and species on the Airport, as defined by the Washington State Department of Fish and Wildlife (WDFW), the Master Plan Update (MP Update) scope included an expanded critical areas/priority habitats and species environmental inventory assessment. This assessment, which is intended to help establish the framework for structuring agreed upon agency mitigation recommendations for the existing priority habitat and species located on the Airport, includes a detailed description of the regulatory guidance and mandates set forth by the various State and Federal Agencies, as well as the existing prairie species that are found at the Airport. This document was initially published in December of 2010 as an appendix to Working Paper One of the MP Update. Comments from WDFW on this supplemental planning memorandum were received in November of 2011 and incorporated in early 2012. In January of 2013, FAA requested that this document be removed from the MP Update report and included as an attachment to the Draft Priority Habitats & Species Recommended Mitigation Measures Agreement Planning Memorandum.

Background

Within the State of Washington, the legal framework for Airport Compatibility Planning and the protection of priority habitats and species (i.e., Critical Areas) is set forth in Washington State Legislation specified in the Growth Management Act (GMA), which is codified in RCW 36.70A. According to the regulations of the GMA, the State's fastest growing cities and counties must adhere to a variety of adopted goals to guide the development and adoption of comprehensive plans and development regulations. For the purposes of this assessment, the planning focus will be on the relationship of existing transportation facilities (i.e., Olympia

Regional Airport) and the existing designated priority wildlife habitat areas (i.e., Critical Areas), that are located on, or in the vicinity of, the Airport. The fact that State regulations for protecting both general aviation airports and wildlife habitat areas are mandated within the same statute does introduce some regulatory challenges between the Airport Sponsor (i.e., the Port of Olympia), the City of Tumwater, and various State and Federal agencies [e.g., the WDFW and the Federal Aviation Administration (FAA)].

Olympia Regional Airport

Olympia Regional Airport is located within the City of Tumwater jurisdictional boundaries in Thurston County, but is owned and operated by the Port of Olympia. The Airport is classified as an *Essential Public Facility*, which is defined as those facilities that are typically difficult to site, and "no local comprehensive plan or development regulation may preclude the siting of essential public facilities". The regulation of essential public facilities is codified in RCW 36.70A.200.

It should also be noted that local governments (i.e., City, County, and/or combinations thereof) are responsible for ensuring compatible land use and appropriate zoning requirements on, and around, airports within their jurisdiction. Within the State of Washington, in accordance with RCW 36.70.547 General Aviation Airports – Siting of Incompatible Uses, "Every county, city, and town in which there is located a general aviation airport that is operated for the benefit of the general public, whether publicly owned or privately owned public use, shall, through its comprehensive plan and development regulations, discourage the siting of incompatible uses adjacent to such general aviation airport".

As identified in the *Inventory of Existing Conditions* chapter of the MP Update, the City of Tumwater has promoted land use compatibility within the airport environs through a combination of existing zoning and airport overlay zoning regulations. In addition, the City of Tumwater has addressed the issue of the Airport, relative to the siting criteria specified for *Essential Public Facilities* through the adoption of the *Lands for Public Purposes Plan/2002 Update*. This document states under section *3.2.2* that "Thurston County and each city and town will"… "Base decisions on siting County-wide and State-wide public capital facilities on the jurisdiction's adopted plans, zoning and environmental regulations, and the following general criteria: a. County-wide and State-wide public capital facilities shall not have any probable significant adverse impact on lands designated as critical areas or resource lands;"

Siting Essential Public Facilities:
1.1 Classifies regional airports as a "Type One, Multi-county facilities".

2.a. States "It is expected that an Environmental Impact Statement may be required for most type one and type two facilities in accordance with the SEPA environmental review process."

5.0 States "Essential public facilities shall not have any probable significant adverse impact on critical areas or resource lands, except for lineal facilities, such as highways, where no feasible alternative exists (adapted from County-Wide Policy 4.2(a))."

7.d States "Applicants for Type One essential public facilities shall provide an analysis of the alternative sites considered for the proposed facility. This analysis shall include the following:… A general description of the relative environmental, traffic, and social impacts associated with locating the proposed facility at the alternative sites which meet the applicant's basic siting criteria. The applicant shall also identify proposed mitigation measures to alleviate or minimize significant potential impacts." An expansion of airport facilities may be considered a "proposed facility".

Finally, 10.0 States "No element of the Tumwater Comprehensive Plan may preclude the siting of listed essential public facilities. However, under the Growth Management Act the City does have the discretion to indicate where these types of uses are appropriately sited."

Priority Wildlife Habitat Areas (Critical Areas)

As noted in the *Background* section of this document, the GMA specifies the regulations that growing cities and counties must follow to identify, protect, and conserve critically sensitive environmental areas (i.e., Critical Areas), which include:

- Wetlands
- Aquifer Recharge Areas
- Frequently Flooded Areas
- Geologically Hazardous Areas
- Fish and Wildlife Habitat Areas

The existing *Wildlife Habitat Areas* located on the Airport will be the focus of this assessment, and the associated regulations will be evaluated to determine how future development and/or redevelopment of Airport property can be safely accommodated on lands that are currently designated as *Wildlife Habitat Critical Areas*.

City of Tumwater Regulations

This section contains a description of the City of Tumwater regulations regarding the protection of prairie habitat and protected species.

City of Tumwater Conservation Plan (2005). The City of Tumwater has addressed the issue of Critical Areas protection within their comprehensive planning documents. The City has prepared a *Conservation Plan* that provides guidance for "maintaining species within their preferred habitats and accustomed geographic distribution", and a large portion of the Airport

has been classified as critical wildlife habitat area (see Figure A17, entitled *PRIORITY HABITATS & SPECIES AREA MAP* in the *Inventory of Existing Conditions* chapter).

WDFW maintains a listing of the priority habitats and species that the City of Tumwater uses to address its fish and wildlife habitat review. A Habitat Protection Plan must be submitted by the permit applicant when protected habitat is located on a site proposed for development. It should also be noted that "habitat protection does not require that all individuals of all species are protected, but does demand that land use planning be sensitive to the priority of saving and protecting animal-rich environments".

City of Tumwater Critical Areas Ordinance (CAO)/Tumwater Municipal Code (TMC) Title 16 Environment. The City of Tumwater CAO regulates fish and wildlife habitats in Chapter 16.32 – Fish and Wildlife Habitat Protection. This chapter defines protected habitats and species as those habitats and species qualified as endangered, threatened, or sensitive as identified by WDFW (TMC 16.32.050 – Habitats Defined and Protected). Endangered and threatened habitats and species include both Federal and State-listed (TMC Chapter16.32.030 – Definitions). The species found at Olympia Regional Airport that are protected under this section include the Mazama pocket gopher, streaked horned lark, Taylor's checkerspot, and mardon skipper. This chapter also includes protection for locally significant habitats and species. These are species that are not State-listed, but are species of particular importance (TMC 16.32.055). The species found at Olympia Regional Airport that are protected under this section include the Oregon vesper sparrow, Puget blue, and Valley silverspot. Detailed information on all of these species that are located at the Airport is presented in later sections of this document. In addition, the habitat for these species is also protected under Chapter 16.32.055(B). WDFW identified state priority habitat is also protected under the Tumwater CAO. Areas of Airport property that support these species may meet the WDFW criteria of Westside Prairie habitat, although WDFW does not currently map state priority habitat on the Airport property (WDFW 2012a).

The CAO also requires that no person, corporation, or other legal entity develop a site that supports a protected fish and wildlife habitat area as defined by the CAO without having received prior approval for protection or mitigation by the City of Tumwater through the proper environmental review process (TMC 16.32.040 – Approval Required). The language regarding Fish and Wildlife Habitat Areas in TMC 16.32.050 is consistent with the *Conservation Plan* and; similarly, in TMC 16.32.060 regarding Habitat Areas – Buffers, the language is the same regarding buffers being established on a case-by-case basis, as determined by a qualified professional. No additional information relevant to the MP Update is included in the CAO that is not already described in the *Conservation Plan*.

Port of Olympia and WDFW Interlocal Agreement (2008). In 2008, the Port of Olympia entered into an *Interlocal Agreement* with the WDFW for the protection and mitigation of State species of concern at Olympia Regional Airport that would permit the Port of Olympia to implement

planned development projects[1]. The purpose of the agreement was to document the development terms of the Airport's Proposed Five-Year Development Plan, which included the establishment of a Mazama Pocket Gopher Habitat Conservation Area and the identification of requested habitat management areas for the Streaked Horned Lark, Vesper Sparrow, and several butterfly species of concern, as well as a prairie vegetation conservation area. The 8.6-acre Habitat Conservation Area (i.e., Parcel #38400003100) for the Mazama Pocket Gopher consists of two parts, 3.1 acres and 5.5 acres, separated by the runway approach lights. This conservation easement is located east of the northern portion of the Airport, across Capitol Boulevard S.W., and is entirely encapsulated within paved roadways that are approximately 35 feet in width. The conservation area is maintained in very short grass, as parking for the annual Airport Air Show, and future conservation areas may also be established. WDFW also has authorization to monitor, survey, and trap pocket gophers within proposed project areas, and relocate them without restriction.

The *Interlocal Agreement,* along with the boundary of the Mazama Pocket Gopher Habitat Conservation Area, is presented in Figure One for reference. In addition, the terms of the agreement also specify that the "Airport Five-Year Development Projects can continue as planned in accordance with WDFW response to the Five-Year Airport map of planned activities" and defined management areas for the "Streaked Horned Lark, Vesper Sparrow and the requested Butterfly and Prairie Habitat Area will be preserved until a final resolution is achieved as part of the FAA sponsored Airport Master Plan Update" [2]. In addition, the defined boundaries of the proposed critical areas and their associated management protocols must be "mutually developed and agreed upon by the Federal Aviation Administration (FAA), the WDFW, and the Port" [3].

Thurston County Regulatory Considerations

Although the Airport is not under the jurisdiction of Thurston County, this section contains additional literature review that was conducted to provide a regulatory framework for the protection of prairie habitat and protected species located outside the jurisdictional boundaries of the City of Tumwater. The County is in the process of updating its existing Critical Areas Ordinance, which governs how development and/or redevelopment can occur on or near environmentally sensitive lands. Potential amendments include additional measures to protect prairies and oak habitats, and an interim ordinance (Ordinance No. 14380) was renewed in 2010 and is available for review in Attachment Two. If an off-site mitigation agreement is

[1] The City of Tumwater is the reviewing and permitting agency for tenant proposed improvements to Airport Property, and the City utilizes the WDFW as the reviewing agency for proposed projects.

[2] Due to the proposed Federal listing of the lark and gopher in late 2012, recommendations for revisions to the existing Interlocal Agreement associated with the completion of the Airport Master Plan Update have been delayed until final rulings on the species are published by the USF&W service.

[3] Contingent upon the final ruling on the Federal listing of the lark and gopher, the USF&W service would also be included as an agency stakeholder in the establishment of proposed critical area habitat boundaries

reached between the FAA, the WDFW, and the Port, it is likely that the mitigation site would be located within the jurisdiction of Thurston County.

Thurston County Critical Areas Ordinance (CAO). The Thurston County CAO [Thurston County Code (TCC) Chapter 17.15] is intended to implement the policies and guidelines of the Washington State Growth Management Act and carry out the goals and policies of the Thurston County Comprehensive Plan (last updated in 2004). The Thurston County CAO protects important habitats and species to Thurston County per the Thurston County critical areas inventory. These important habitats and species were selected from those WDFW Priority Habitats and Species (PHS) that are known to occur in Thurston County. Development proposals that lie within 600 feet of a point location are subject to review under this chapter.

The Thurston County CAO contains similar language as the City of Tumwater *Conservation Plan*, requiring the development of a Habitat Management Plan (TCC 17.15.735). According to this chapter, the plan should describe how development impacts from a proposed project will be addressed through on- or off-site habitat mitigation per the requirements of the chapter. This chapter cites the Management Recommendations for Washington's Priority Habitats and Species (1991) as the required reference for this plan.

WDFW Management Recommendations for Washington's Priority Habitats and Species (1991). The WDFW Management Recommendations for Washington's PHS is a document that includes strategies for providing habitat for priority wildlife species (WDFW 1991). Since the 1991 document was published a variety of additional species and habitat management recommendation documents have been completed. The WDFW web site provides access to all current management recommendations (WDFW 2012b). WDFW management recommendation documents cover the Oregon silverspot and the pocket gopher, in addition to several other species. The most current management recommendations supersede previously published documents. These recommendations are not regulatory, because WDFW does not regulate development of properties, but they are intended for site-specific discussions with land owners to encourage preservation and enhancement of protected habitat and incorporate post-project monitoring. In addition, most jurisdictions, including the City of Tumwater and Thurston County CAO's, reference WDFW as the lead authoritative state agency for the protection of sensitive species and habitats and defer to the management recommendations of the WDFW as regulatory requirements under their authority.

Management Recommendations for Mazama Pocket Gopher (2011). The WDFW *Management Recommendations for the Mazama Pocket Gopher* document is part of a series of PHS management recommendations issued by the WDFW. The management recommendations are not regulatory, but are based on the best available science protecting gophers and their habitat. Recommendations contained in this document for unavoidable impacts to Mazama pocket gopher active mounds are in the form of off-site mitigation or a combination of on-site and off-site mitigation. The combination is preferred where there is the potential to retain some on-site

habitat, even if that habitat is less than the recommended amount (a 3:1 ratio, for each acre of habitat that is unavoidably impacted). Per the WDFW recommendations, a Habitat Management Plan (HMP) should be implemented for the mitigation site and should specify that the site is being used as off-site mitigation for another development site, and may not be used as mitigation for other development activities (WDFW 2011).

South Puget Sound Prairies – Site Conservation Plan (2002). The *South Puget Sound Prairies Site–Conservation Plan* is a summation of the work developed by The Nature Conservancy, Washington Department of Natural Resources, WDFW, and the U.S. Fish and Wildlife Service (known as the "Core Group"). This Plan emphasizes the conservation of prairie and woodland oak habitat in the South Puget Sound region due to their unique biological attributes and regional significance. This Plan is not a regulatory document, but provides several conservation strategies for prairie and woodland oak habitat and identifies the species listed in Table 1 as particular species of concern, in addition to several other plant and animal species. Five primary conservation strategies are included in this plan, such as:

1. Maintain and enhance management at currently protected areas
2. Protect priority habitats within the conservation planning areas
3. Develop and implement recovery programs for the rarest species
4. Coordinate and focus research and monitoring
5. Public outreach and awareness

These strategies are included in the plan as a framework based on the information gathered from the Core Group regarding species and habitats of conservation concern in the prairies and oak woodlands of South Puget Sound.

Federal Aviation Administration (FAA) Compliance Program

The primary role of responsibility for the FAA is ensuring the safe and efficient operation of airports within the national aviation system, and Federal law pre-empts local regulations on issues or conflicts related to aircraft safety, navigable airspace, flight operations, and noise control. However, the FAA has no statutory or regulatory authority for controlling land uses or zoning within the airport environs, but they do have some leverage with regard to Airport Sponsor grant assurances in conjunction with Federal funding participation for eligible airport projects. Therefore, as Airport Sponsor, the Port of Olympia is responsible for meeting the requirements set forth in the FAA Airport Improvement Program (AIP) upon the acceptance of funds from FAA-administered airport financial assistance programs. These obligations (or assurances), which are enforced by the FAA through the Airport Compliance Program, require the recipients to maintain and operate their facilities safely and efficiently and in accordance with specified conditions that are set forth in numerous Airport Advisory Circulars and Federal Aviation Regulations.

It should be noted that the Airport Sponsor grant assurances do not specifically reference the mitigation of wildlife hazards on airports; however, three of the grant assurances (i.e., No.'s 19, 20, and 21), which are presented in the following text, can be broadly interrupted to address the issue:

- **Grant Assurance No. 19/Operation & Maintenance:** The airport and all facilities shall be operated at all times in a safe and serviceable condition, and the airport sponsor will not cause or permit any activity or action thereon, which would interfere with its use for airport purposes. *Issue for consideration: Does the designation of priority wildlife habitat areas on airport property interfere with the safe operation of the airport?*

- **Grant Assurance No. 20/Hazard Removal and Mitigation:** The airport sponsor will take appropriate action to assure that such terminal airspace, as is required, to protect instrument and visual operations to the airport will be adequately cleared and protected by removing, lowering, relocating, marking, lighting, or otherwise mitigating existing airport hazards and preventing future airport hazards. *Issue for consideration: Does the existing wildlife within the designated priority wildlife habitat areas on airport property constitute an airport hazard?*

- **Grant Assurance No. 21/Compatible Land Use:** The airport sponsor will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to, or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. *Issue for consideration: Does the designation of priority wildlife habitat areas on airport property conflict with the compatible land use objectives of the airport sponsor?*

In addition to these grant assurances, the terms of the *Interlocal Agreement* described previously between the Port of Olympia and the WDFW also potentially raise some airport sponsor grant assurance issues. Grant Assurance No. 5/Preserving Rights and Powers, which specifies that the airport sponsor "will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interest in the property shown on Exhibit A to this application or, for a noise compatibility project, that portion of the property upon which Federal funds have been expended, for the duration of the terms, conditions, and assurances in the grant agreement without approval by the Secretary". *Therefore, a determination will ultimately be made by the FAA, in consultation with USDA Wildlife Services, as to whether the designation of the Habitat Conservation Areas on airport property constitutes a development encumbrance of airport property, creates an airport hazard, and/or restricts/interferes with normal airport operations.*

FAA's Safety Management System (SMS)

In addition to the safety compliance program that was described in the previous section, the FAA has embarked on a new program, designed to "raise-the-bar" of the U.S. aviation system to next

level of safety. This program is known as the Safety Management System (SMS) and applies to all lines of business within the FAA and throughout the aviation industry. According to information contained in FAA Order 5200.11 *FAA Airports (ARP) Safety Management System*, an SMS provides a consistent means of assessing safety risks through the establishment of an integrated Safety Policy, a functioning Safety Risk Management (SRM) approach, a Safety Assurance model that identifies performance targets and facilitates continuous improvement, and a program of Safety Promotion that includes clear communication.

- **Safety Policy.** Outlines the methods and tools for achieving desired safety outcomes and details management responsibility and accountability for safety.

- **Safety Risk Management (SRM).** Is a formalized approach to safety that ensures sound safety decisions by identifying and examining hazards early, while laying the groundwork for effective risk mitigations based on well-documented data. In simple language, SRM attempts to gauge how likely a hazard is to result in an incident, define the potential consequences, and determine how much risk (if any) is acceptable.

- **Safety Assurance.** Includes formalized processes that proactively identify hazards and risks. It provides tools that allow the FAA to track how the SMS performs, confirm the SMS is achieving intended outcomes, and continuously improve standards, operations, and practices to increase safety.

- **Safety Promotion.** Promotion of a positive safety culture is essential to Safety Promotion in an SMS. It provides a method for sharing safety information to develop and apply lessons learned and best practices for hazard identification, Safety Assessments and mitigations, and other SRM responses.

Overall, SMS provides an opportunity to identify and address safety issues before they can become hazards, with the objective being to increase aviation system safety.

As presented in FAA Order 8000.369 *Safety Management System Guidance,* the FAA's statutory authority for SMS is derived in part from Title 49 of the United States Code (49 U.S.C.) and Title 14 of the Code of Federal Regulations (14 CFR). Title 49 U.S.C. Chapter 401 of subpart I, part A, Section 40101 (d), establishes safety considerations in the public interest. In addition, 49 U.S.C. Chapter 447 of subpart III, part A, subtitle VII, prescribes the authority and powers of the FAA concerning safety regulations.

According to FAA Fact Sheet, dated November 4, 2010, the FAA is in the process of implementing SMS and system safety-based oversight. In October of 2010, the FAA issued a proposed rule that would require airports certificated under Part 139 to establish SMS for all airfield and ramp areas. Congressional action has mandated that the FAA develop a rule requiring all Part 121 operators to implement SMS, and the FAA is considering SMS regulations

for other groups of aviation service providers, including Part 135 operators and Part 145 repair stations.

FAA & Wildlife Hazards

In their continuing efforts to promote airport safety, the FAA has been proactive in the support of research and the preparation of guidance documents on the subject of wildlife hazards and airports (i.e., *Hazardous Wildlife Attractants On or Near Airports*/AC No. 150/5200-33). The FAA has also sponsored the preparation of research document produced through the Airport Cooperative Research Program (ACRP) Report 32/*Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports*. In addition, the FAA has collaborated with other Federal agencies [i.e., the U.S. Air Force (USAF), the U.S. Army, the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USF&WS), and the U.S. Department of Agriculture (USDA)], with the establishment of a *Memorandum of Agreement (MOA) to Address Aircraft-Wildlife Strikes*, which effectively addresses existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the United States. The FAA and the USDA Wildlife Services (USDA WS) have also established a Memorandum of Understanding (MOU), No. 12-34-71-0003-MOU, to formalize continued cooperation in the mitigation of wildlife hazards to aviation.

Hazardous Wildlife Attractants On or Near Airports/AC No. 150/5200-33. Aircraft collisions with wildlife represent a serious economic and public safety concern, and Advisory Circular (AC) 150/5200-33 provides guidance on the various land uses that have the potential to attract wildlife on, or in the vicinity of, airports. Airports that have received FAA-administered airport financial assistance programs must follow these guidelines. Many airports, including Olympia Regional, have relatively large tracts of open and undeveloped land, which can be attractive to wildlife for feeding, loafing, reproduction, and escape. Any wildlife in these areas can present potential hazards to aviation, particularly within the airport's approach/departure airspace or air operations area. This AC also specifies the recommended separation criteria for hazardous wildlife attractants from airports (e.g., 10,000 feet for airports serving turbine-powered aircraft) and offers airport sponsors procedures for wildlife hazard management, which includes the preparation of Wildlife Hazard Assessments (WHAs) and Wildlife Hazard Management Plans (WHMPs). It should also be noted that in the fall of 2009, the FAA's AIP funding and eligibility requirements for WHAs was modified to also include general aviation airports with documented reports of wildlife hazards.

Airport Cooperative Research Program (ACRP) Report 32, Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports. This guidebook is a useful resource to airport management and staff, offering techniques and strategies for addressing wildlife hazards at general aviation airports. The report includes information on the different species that can be found at airports, guidance for identifying and controlling these species, reference to the various wildlife attractants and best management practices that can be used to minimize wildlife activity

on and around airports, wildlife control strategies and techniques that are best used at general aviation airports, and how to develop a wildlife control program.

Memorandum of Agreement (MOA) to Address Aircraft-Wildlife Strikes. This MOA between Federal resource agencies that was previously referenced was established in 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. These efforts are intended to minimize wildlife risks to human safety while protecting environmental resources. According to information presented in the Agreement, aircraft-wildlife strikes are the second leading cause of aviation-related fatalities, and approximately 97% of the reported civilian aircraft-wildlife strikes involve common, large-bodied birds or large flocks of small birds. In addition, about 90% of aircraft-wildlife strikes occur on or near airports when aircraft are at altitudes of less than 2,000 feet. Therefore, the signatory agencies will encourage stakeholders to promote land uses that comply with the siting criteria specified in AC 150/5200-33 (see Attachment A in the AC). Exceptions to these siting criteria will be considered (see Section 2.4.b of the AC) in conjunction with critical habitats for Federally-listed endangered or threatened species and ground water recharge. This section of the AC refers specifically to wetlands, but a determination will need to be made on whether a similar consideration can be extended to the state priority prairie habitat and the associated Federal proposed threatened and endangered species and the State Threatened, Endangered, and Candidate species identified for protection at Olympia Regional Airport.

When there is disagreement among the signatory agencies about whether a particular land use is attractive to wildlife, the FAA, USAF, or USDA WS will conduct a WHA to determine whether a WHMP should be prepared. The Plan, if required, should avoid adverse impacts to wildlife populations or other sensitive habitats (e.g., the existing critical habitat areas on the Airport) to the maximum extent practical, and unavoidable impacts will be fully compensated pursuant to all applicable Federal laws, regulations, and policies. A copy of the MOA is presented in Attachment Three for reference.

Memorandum of Understanding (MOU)/No. 12-34-71-0003-MOU. This MOU between the FAA and USDA WS was established in 2005 to promote the mitigation of wildlife hazards to aviation. According to the Understanding, it is agreed that the USDA WS "has the professional expertise, airport experience, and training to provide support to assess and reduce wildlife hazards to aviation on and near airports". Technical support to the FAA or Airport Sponsor from USDA WS may include site visits and a WHA, as well as support in developing WHMPs and recommendations on control and habitat management methods designed to minimize the presence of hazardous wildlife on or near the airport. A copy of the MOU is presented in Attachment Four for reference.

Existing Wildlife at Olympia Regional Airport

A listing of the endangered, threatened, and candidate species that are located at Olympia Regional Airport is presented in the following table, entitled *Olympia Regional Airport Threatened, Endangered, and Candidate Species*, as well as information on each species relative to their presence on the Airport and general recommended management practices. Also, general information on each species is included in Attachment Five for reference.

Table 1
OLYMPIA REGIONAL AIRPORT THREATENED, ENDANGERED, AND CANDIDATE SPECIES

Species			Species Status		Mapping Criteria
Common Name	Scientific Name	Animal Type	State	Federal	
Mazama (Western) pocket gopher	*Thomomys mazama*	Mammal	ST	FT	Individual Occurrence
Oregon vesper sparrow	*Pooecetes gramineus affinis*	Bird	SC	FCo	Breeding location
Streaked horned lark	*Eremophila alpestris strigata*	Bird	SE	FT	Breeding location
Taylor's checkerspot	*Euphydryas editha taylori*	Butterfly/Moth	SE	FE	Individual Occurrence
Mardon skipper	*Polites mardon*	Butterfly/Moth	SE	none	Individual Occurrence
Puget blue	*Plebejus icarioides blackmorei*	Butterfly/Moth	SC	none	Individual Occurrence
Valley silverspot	*Speyeria zerene bremnerii*	Butterfly/Moth	SC	FCo	Individual Occurrence

Legend for Listing Status			
State		Federal	
ST	State Threatened	FT	Federal Threatened (Proposed)
SC	State Candidate	FCo	Federal Species of Concern
SE	State Endangered	FE	Federal Endangered (Proposed)

Mazama Pocket Gophers at Olympia Regional Airport. In 2006, the Port of Olympia prepared a Draft Olympia Regional Airport Habitat Management Plan and submitted it for review to the WDFW. The WDFW responded to this document in a memo dated November 8, 2007. In April 2008, the Port of Olympia prepared a five-year development plan for Olympia Regional Airport

that was submitted for review by the City of Tumwater and WDFW. The WDFW responded to the five-year development plan in a memo dated August 26, 2008, in which it stated that all comments provided in the November 2007 review should be considered part of an in addition to the August 2008 official response, unless otherwise noted. These documents emphasize that the connectivity between populations outside of the Airport are important to maintain genetic diversity. A population modeling study performed by Gail Olsen for Olympia Regional Airport was referenced as a source for the WDFW to draw conclusions. However, no data was provided in this document.

The WDFW 2008 *Response to the Five-Year Plan* stated that pocket gopher population declines by 5-6% annually unless supplemented by immigrants or boom years and an isolated population would decline by two-thirds in 20 years. Also, populations of less than 20 individuals are vulnerable to local extinction. Based on this information derived from mathematical modeling, the WDFW concludes that maintaining population connectivity seems essential for maintaining the population at, and around, the Airport. The boundary of the Mazama Pocket Gopher Habitat Conservation Area, as defined by the *Interlocal Agreement,* is presented in the following illustration, entitled *Requested WDFW Mazama Pocket Gopher Habitat Management Area and Existing Habitat Conservation Area.*

The WDFW states that juvenile gophers disperse from 40 meters (131 feet) to 200 meters (656 feet) of their natal burrows. The WDFW suggests that the majority of pocket gophers disperse a maximum of 40 meters (131 feet) and a very few disperse beyond 200 meters (656 feet). Based on the mathematical modeling study, the WDFW extrapolates that the number of surviving female pocket gophers dispersing to populations off of the Airport is less than 20 for those that disperse 200 meters (656 feet)-300 meters (984 feet), but increases to 19-50 for those dispersing 100 meters (328 feet)-200 meters (656 feet). However, it is not clear if the numbers representing the dispersing populations represent annual migrations, total number that disperse, or percent of those that disperse.

In addition, the WDFW assumes that pocket gophers may cross paved surfaces less than or equal to 50 meters (164 feet) in width, beyond which successful crossing is unlikely. The WDFW states that other barriers include: 1) forested areas, 2) wet areas, 3) paved areas greater than or equal to 50 meters, 4) highly cultivated and manicured lawns, and 5) inhospitable soil types. The WDFW is also concerned that developments planned for the periphery of the Airport would limit pocket gopher dispersal to off-site populations. The WDFW also assumes that planned development on and off the airport would reduce the on-site pocket gopher population by 11% over some length of time.

The WDFW provides specific Mazama pocket gopher management recommendations for Olympia Regional Airport projects identified in the five-year plan that approve specific aviation and revenue projects; limits the dimesions of impervious surface and the placement of specific safety, aviation, and maintenance projects; discourages the placement of one revenue project; and

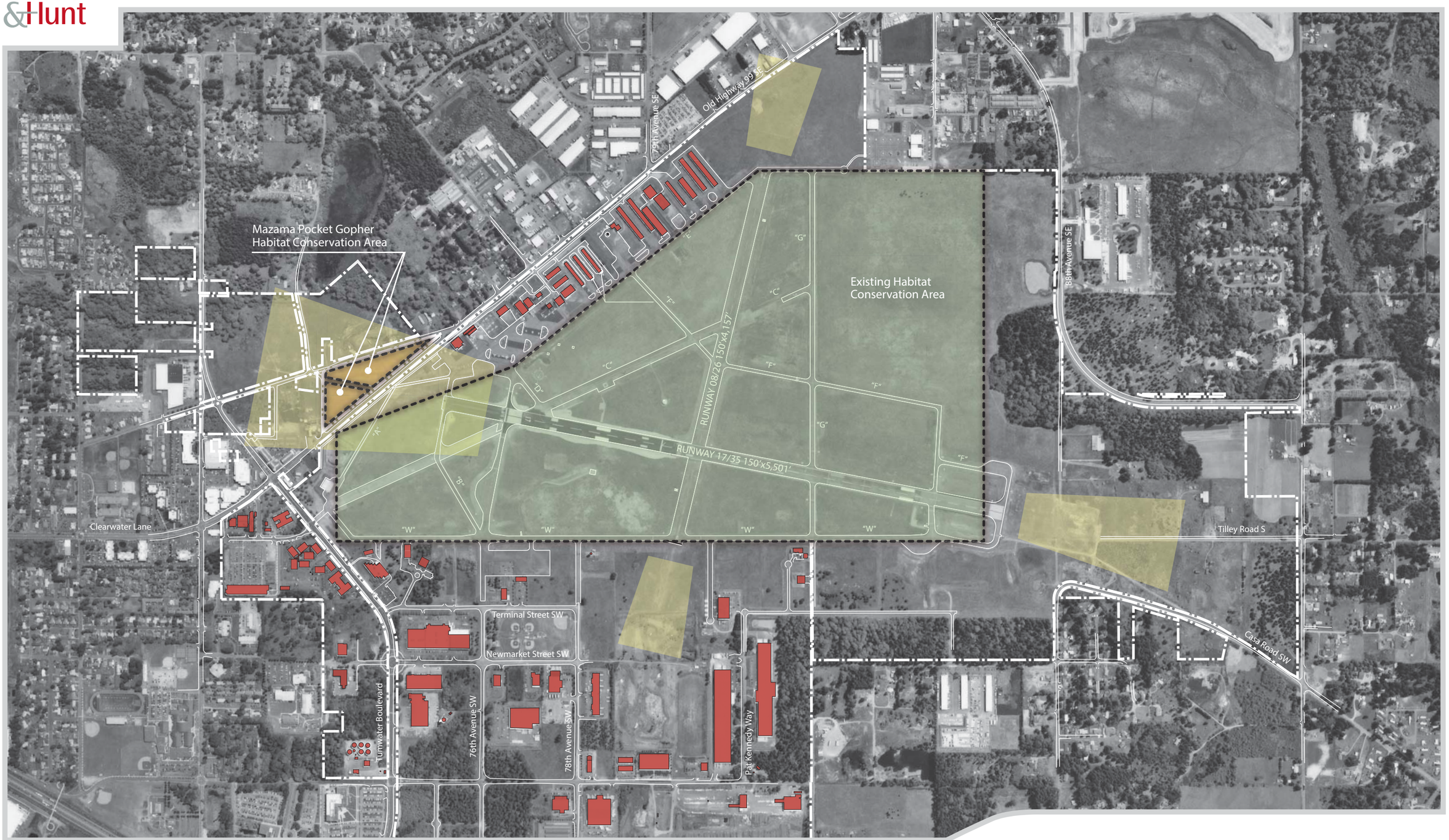

FIGURE 1

Requested WDFW Mazama Pocket Gopher Habitat Management Area and Existing Habitat Conservation Area1 Area[1]

[1] The Mazama Pocket Gopher Habitat Conservation Area was defined by the 2008 Interlocal Agreement between the Port of Olympia and WDFW.
Source: Thurston County Development Services, August 2009.

recommends review for all future projects on property surrounding the airport and leased from the Port of Olympia. The WDFW further provides specific recommendations for consideration of this 20-year plan, including:

1. Not result in creation of impervious surface ≥25 m in width in part or ≥40m in width in total project area;
2. Not be situated within 200m of any OA boundary.
3. WDFW in cooperation with OA should conduct 1 complete airport gopher inventory every five years and the result of that inventory used to guide future management. OA and WDFW should consider a cost share for conducting these surveys.

Streaked Horned Lark at Olympia Regional Airport. When considering long-term management goals for the streaked horned lark at the Airport, the WDFW 2008 *Response to the Five-Year Plan* states that it is not appropriate to think of the larks nesting at the Airport as either a population or as viable. Populations in Washington may be declining at a rate of 40% per year (Pearson *et al.*, 2008). The WDFW suggests that the global population, including the individuals nesting at the Airport, is currently not viable and prone to extinction, unless trends change in the near future.

Eighteen (18) distinct territories for the streaked horned lark have been identified at the Airport. The considerable area of unoccupied habitat between the two primary nesting areas suggests that additional nesting could occur if habitat were improved. Patches used for nesting may vary in size from 324-950 acres. Because additional potential habitat occurs at the Airport, the WDFW recommends that eighteen (18) to thirty (30) lark territories be maintained on the Airport, with a nest success rate of 30% or greater.

The WDFW provided management recommendations regarding specific planned aviation, revenue, safety, and maintenance projects identified in the Olympia Airport five-year plan that have the potential to impact streaked horned larks. Additionally, three (3) streaked horned lark management areas have been recommended for establishment at the Airport. Within these areas, the WDFW recommends the following management practices:

1. Minimize impervious surface and retain or replant post activity a maximum of grass dominated habitat with few to no trees or woody shrubs(<10% shrub cover);
2. Create sparsely vegetated habitat with large patches dominated by relatively short annual grasses and native bunch grasses (3.9-13.3 inches tall on average);
3. Do not plant sod forming grasses and hand remove when located;
4. Retain a high percent of bare, pervious surface (16%, particularly dirt, gravel and cobbles as opposed to moss/lichen or thatch dominated ground cover);
5. Plant approximately 10% perennial forbs such as native lupine species (*Lupinus lepidus*) used as "base plants"; and,

6. Avoid the following activities during the nesting season of March 15th through August 15th: mowing, vehicle and aircraft traffic (including ORVs), model airplane flying, dog walking, and gatherings of people and/or vehicles.

Additional management recommendations include:

- No permanent structure be placed ≤100 m (328 ft) from known nesting site;
- The WDFW, in cooperation with the Airport, will conduct a full airport lark inventory every three (3) years over the four month nesting season, and the results of those surveys will be used to guide future management. The Airport and the WDFW to consider a cost share.

The boundary of the recommended Streaked Horned Lark Habitat Management Area, as defined by the *Interlocal Agreement,* is presented in the following illustration, entitled *Requested Streaked Horned Lark Habitat Management Area.*

Oregon Vesper Sparrow at Olympia Regional Airport. The WDFW response to the five-year airport map of planned activities (dated August 26, 2008) recommended that "a property-wide Oregon Vesper Sparrow inventory be conducted every 3 years to determine reproductive success, number of territories and spatial use of the airport. It was further recommended that the Port hire one biologist trained in identification and monitor over the four month nesting season with daily access to the airport. The WDFW would provide consultation and survey protocols for this monitoring. This inventory should begin at the completion and signature of the airport habitat management plan."

Butterflies at Olympia Regional Airport. Olympia Regional Airport is located on the historic Bush Prairie. The WDFW response to the five-year airport map of planned activities (dated August 26, 2008) reported that the Taylor's checkerspot was abundant at the Airport in 1988. A Puget blue was identified at the Airport in 2004. The WDFW stated in its review and comments of the Olympia Regional Airport Draft Habitat Management Plan (dated November 8, 2007) that regular surveys for Mardon Skipper, Taylor's Checkerspot, Puget Blue, and Valley Silverspot butterfies have not been carried out consistently at the Airport and therefore, to conclude that there have been no recent sightings is inaccurate. The WDFW goes on to comment that, "The WDFW requests that the Port conduct a complete butterfly and vegetation survey every 3 years, beginning with the completion and signature of the airport habitat management plan." And that, "These four butterflies are difficult to identify. Surveys for them would have to be conducted by experienced lepidopterists or entomologists familiar with these butterfly genera. Butterfly survey protocols include requirements for weather, time of day, time of year, and observer experience. Often, multiple years of survey are required to determine species presence. WDFW is familiar with these protocols and offers assistance to the Olympia Airport to develop a survey plan for these species."

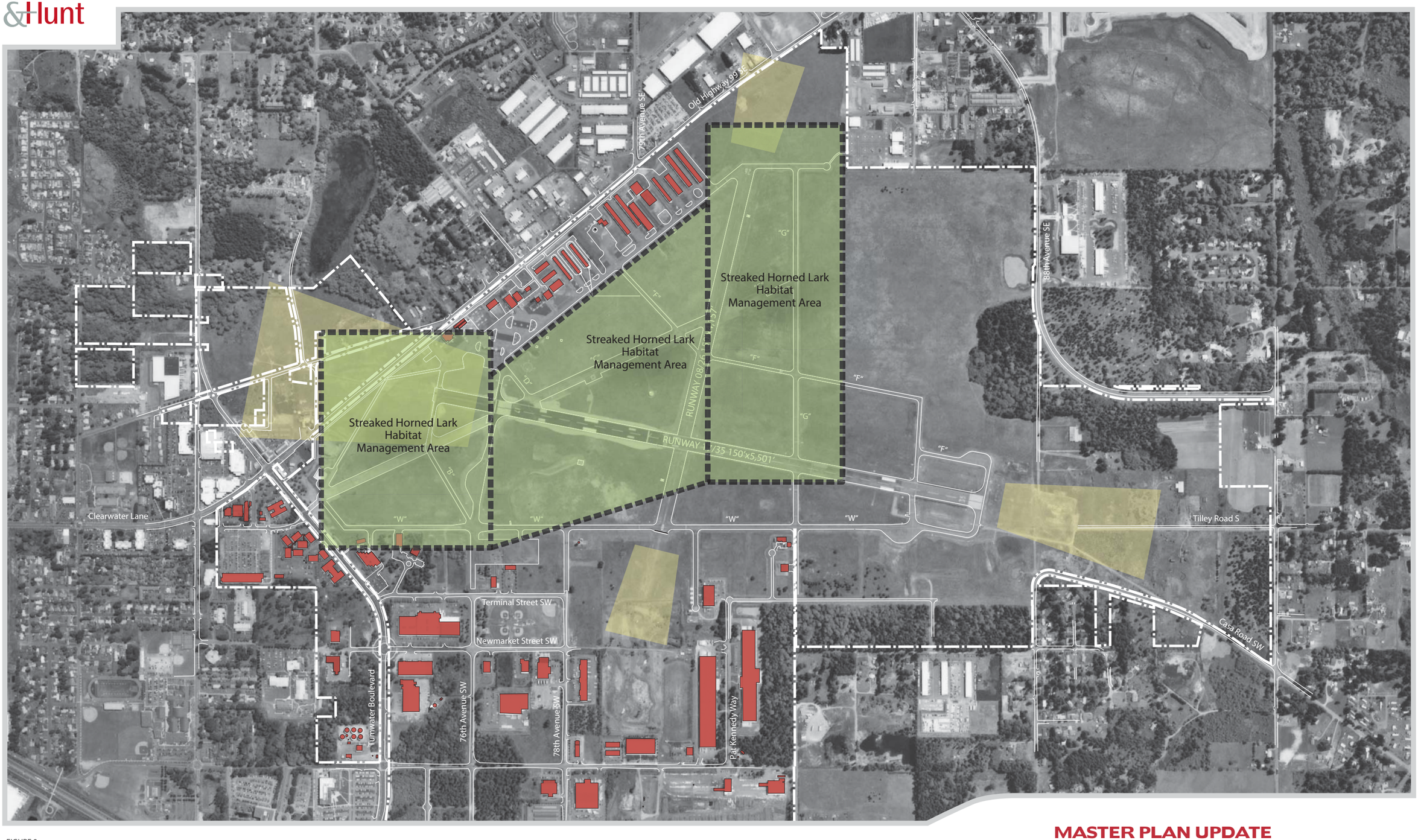

FIGURE 2
Requested Streaked Horned Lark Habitat Management Area

Source: Thurston County Development Services, August 2009.

The WDFW concludes that typical management practices of the remaining grassland at the Airport is incompatible with butterfly conservation. Mechanical mowing at the Airport can be a threat to butterfly populations, eliminating key butterfly plants and injuring or killing butterflies. The WDFW recommends that all areas outside of the streaked horned lark management areas should be managed for prairie habitat restoration and for butterflies with consideration for proposed development projects.

The WDFW recommends in the response to the five-year airport map of planned activities (dated August 26, 2008) that key food plants should be located for butterfly species and should be the focus for future conservation efforts. Repeatedly mowed areas that support key larval food plants should also be identified and surveyed for these species and any occupied portions should be incorporated into a butterfly conservation strategy. Development projects under the 5- and 20-year plans located within the butterfly/prairie habitat management areas should follow recommendations included under the Prairie Vegetation Conservation section below.

WDFW in cooperation with OA should conduct the following butterfly surveys annually; OA and WDFW should consider a cost share for conducting these surveys:

Survey window by species (flight period):

- Taylor's Checkerspot → April 15 to May 31
- Mardon Skipper → May 1 to June 15
- Puget Blue → May 15 to June 30
- Valley Silverspot → July 15 to August 31

Survey design:

- Consist of 3 visits spaced throughout the flight period per species conducted under appropriate survey conditions (time of day, weather);
- Conducted over multiple years.

The boundary of the Butterfly and Prairie Habitat Management Area, as defined by the *Interlocal Agreement,* is presented in Figure 3, entitled *Requested Butterfly & Prairie Habitat Management Area.*

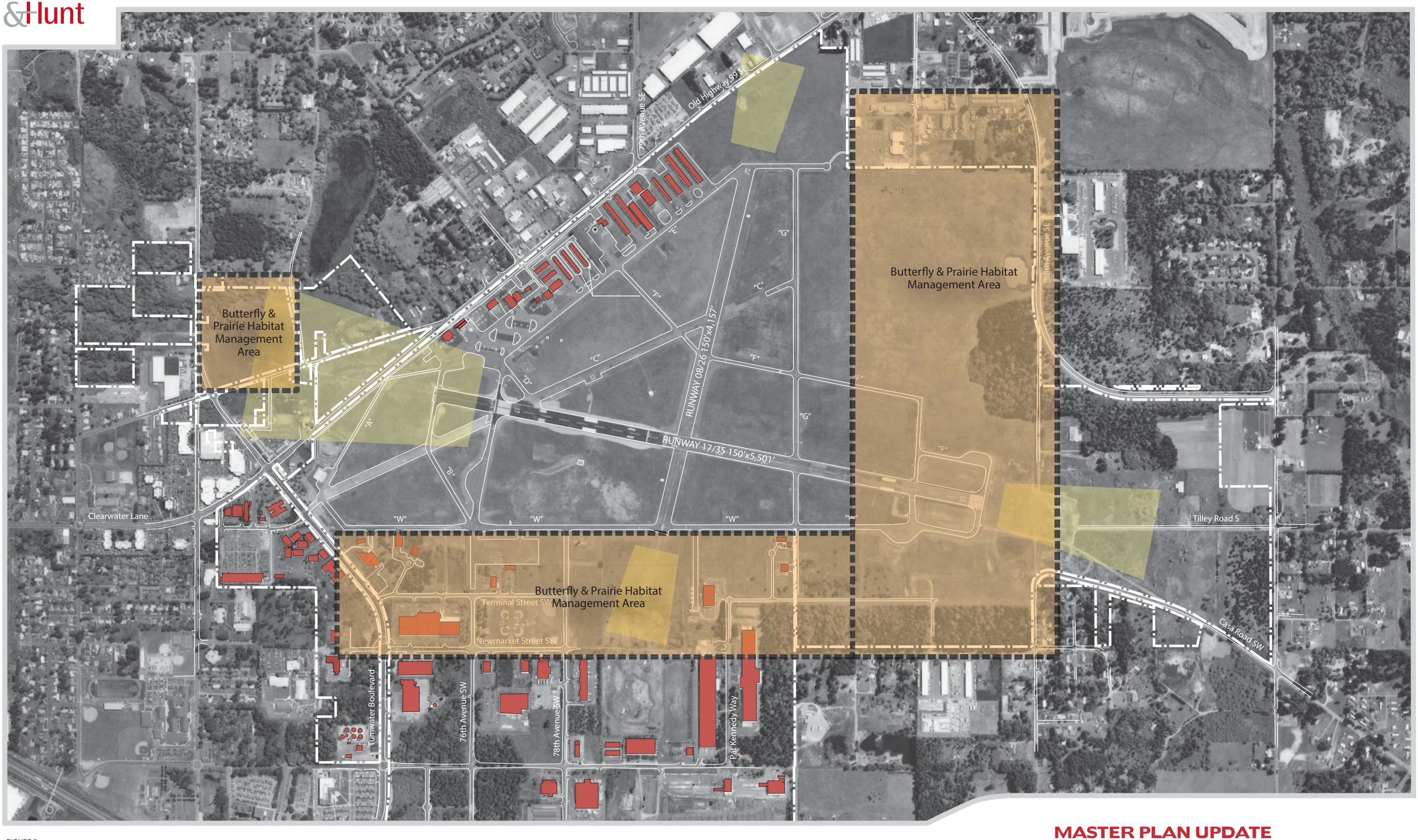

FIGURE 3
Requested Butterfly & Prairie Habitat Management Area

Source: Thurston County Development Services, August 2009.

USDA Wildlife Services (USDA WS)

According to information provided by USDA Staff, it is the mission of the WS to provide Federal leadership and expertise in the reduction of problems caused by injurious and/or nuisance wildlife to agricultural and natural resources, or other wildlife, and minimize potential wildlife harm or threats to human health and safety (e.g., zoonotic diseases from wildlife to humans and wildlife causing civilian or military airplane crashes). The civil and military aviation communities widely recognize that the threat to human health and safety from aircraft collisions with wildlife (wildlife strikes) is increasing (Dolbeer 2000, MacKinnon et al. 2001). Globally, wildlife strikes have killed more than 219 people and destroyed over 200 aircraft since 1988 (Richardson and West 2000; Thorpe 2003; 2005; Dolbeer, unpublished data). Of the 82,057 wildlife strikes reported to the FAA between 1990 and 2007, 51% occurred between July and October and 97% occurred during landing and take-off phases of flight [i.e., phases on or in very near proximity to the ground] (Dolbeer and Wright 2008).

Hazardous wildlife management at airfields includes the promotion of aviation safety by providing increased protection of aircraft from wildlife hazards and risks of wildlife strikes. Two standardized approaches include proactive (i.e., habitat management) and reactive (i.e., harassment and population control) methods. Habitat management includes the physical removal or manipulation of food, water, or cover that attracts wildlife, in an effort to reduce the likelihood that hazardous wildlife will become attracted to the airfield in the first place. It provides the most effective long-term measure for reducing wildlife hazards on or near airports. Harassment and population control include techniques applied after the hazardous wildlife is present on the airport. The ultimate goal is to make the environment unappealing to hazardous wildlife. This is often accomplished by promoting an airport environment with habitat that is monotypic and lacks the required biodiversity that is often required to support indigenous species. However, decreasing habitat for one species may increase its attractiveness to another more hazardous species, or relocate the target species to a less desirable location (Linnell et al. 1997).

Numerous airfields throughout the United States have been requested or required to facilitate/encourage priority habitats on airports for State-listed threatened or endangered wildlife. In many cases, the habitat management for these species created or led to increased hazardous wildlife presence and the risk of wildlife strikes. Reactive management of these hazards frequently requires the lethal removal of individuals that persist following non-lethal harassment attempts. The goal of the USDA WS and FAA is to protect aviation safety while preventing the unwanted killing of hazardous wildlife by recommending proper habitat management/mitigation methods such that hazardous wildlife are not attracted to an airfield in the first place. In November 2006, the FAA issued Certalert No. 06-07 (see Attachment Six for reference), which describes the procedures to be taken by Airport Sponsors in response to requests by state wildlife agencies to designate critical habitats on airports for State-listed threatened and endangered species or species of special concern that may pose a threat to

aviation safety. According to guidance, "on-airport habitat and wildlife management practices designed to benefit wildlife that directly or indirectly create safety hazard where none existed before are incompatible with safe airport operations" and "airport operators must decline to adopt habitat management techniques that jeopardize aviation safety."

The existing (and historic) habitat management procedures at Olympia Regional Airport currently minimize (though does not eliminate) the attractiveness of the airfield to several hazardous wildlife species/groups (e.g., Canada goose, duck, great blue heron, gulls, etc.), and no Federally-listed threatened or endangered species are known to occur on the airfield, although three federal candidate species for listing are documented to occur on the airfield[4]. However, this management provides highly suitable and attractive habitat for other wildlife, which include American crow, American kestrel, coyote, black-tailed deer, European starling, peregrine falcon, red-tailed hawk, and various gull and shorebird species. According to information obtained from the FAA's Wildlife Strike Database (see http://wildlife-mitigation.tc.faa.gov/wildlife/default.aspx), there have been a total of seven (7) wildlife strikes (all birds) reported at the Airport since 1990. See Attachment Seven for the database print-out sheet for the recorded bird strikes at Olympia Regional Airport.

According to resident USDA WS personnel[5], the November 2006/Draft Habitat Management Plan for Olympia Regional Airport would enhance the existing attraction by increasing foraging opportunities for hazardous wildlife, while reducing habitat management options for wildlife control. Enhancements include increasing the proportion of forbs and diversity of grasses, and eliminating mowing between mid-March and mid-August each year. Increasing the proportion of forbs would likely directly increase foraging opportunities for small mammals, insects, deer, geese, and passerines (including European starlings). Allowing the grass to grow taller and possibly go to seed before mowing would likely increase hiding cover for small mammals, insects, and some passerines, as well as increase foraging opportunities for these groups and others. Indirectly, these actions could then increase foraging opportunities for coyotes, European starlings (and other insect and seed-eating passerines), gulls, herons, raptors, and swallows.

At current levels within the Airport, streaked horned larks, Mardon skipper, and Taylor's checkerspot are not considered hazardous to aviation safety. However, there is ample evidence supporting the conclusion that these species and their habitats attract predatory and other wildlife that are hazardous to aviation safety (Witmer et al. 1996, Anderson 2005, Pearson et al. 2008). Increasing habitat suitability for butterflies would likely increase it for other insects as well, providing a greater food source for hazardous species (e.g., American kestrels). Pocket gopher burrows already negatively affect compaction standards within the runway safety areas and runway protection zones and may serve to attract predatory wildlife such as coyotes and

[4] The Mazama Pocket Gopher and Streaked Horned Lark were proposed for listing to Federal Threatened status in the Fall of 2012. The Taylor's Checkerspot Butterfly was proposed for listing to Federal Endangered status in the Fall of 2012.

[5] Subsequent to the publication of USDA WS personnel's assessment of the Draft Habitat Management Plan for Olympia Regional Airport, USDA WS provided a preliminary safety determination for the initially proposed Critical Area Habitats at Olympia that included on-going safety management reviews and consultation.

hawks. In addition, their habitat preferences are attractive to deer, small passerines (including European starlings), and prey species attractive to other hazardous wildlife.

Summary

The goal of this expanded critical areas/priority habitats and species environmental inventory assessment is to help establish the framework for structuring agreed upon agency mitigation recommendations for the existing priority habitat and species located on Olympia Regional Airport. This assessment has included a detailed description of the regulatory guidance and mandates for airports set forth by the various State and Federal Agencies, as well as the existing prairie species that are found at the Airport. As identified in this document, there are some conflicts in this regulatory guidance between the agencies and some compromises will likely be required by all parties to further promote the operational safety of Olympia Regional Airport and concurrently not lead to further reductions in state listed and federal candidate species.

It is recommended that this Supplemental Planning Memorandum, along with the materials from Working Paper One of the MP Update be distributed to the members of the Study Advisory Committee (SAC) for review prior to the first SAC MP Update meeting. Let us know if you have any questions or require additional support documentation in response to this Supplemental Planning Memorandum.

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APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

ATTACHMENT ONE

Port of Olympia & WDFW Interlocal Agreement

INTERLOCAL AGREEMENT

INTERLOCAL AGREEMENT FOR PROTECTION AND MITIGATION OF STATE SPECIES OF CONCERN AT THE OLYMPIA REGIONAL AIRPORT.

THIS AGREEMENT is made and entered into in duplicate this 30th day of October, 2008, by and between the PORT OF OLYMPIA, a Washington municipal corporation, (hereinafter "PORT"), and the WASHINGTON DEPARTMENT OF FISH AND WILDLIFE, a Washington State Government Agency, (hereinafter "WDFW").

WITNESSETH:

WHEREAS, the PORT operates a regional general aviation airport within the city limits of the City of Tumwater, Washington and leases land to tenants for development; and

WHEREAS, the City of Tumwater is the reviewing and permitting agency for tenant proposed improvements to airport land; and

WHEREAS, the City of Tumwater utilizes WDFW as the reviewing agency for proposed projects compliance with Chapter 16.32 of the Tumwater Municipal Code; and

WHEREAS, WDFW personnel satisfy the requirement of TMC 16.32.030(L) as "Qualified Personnel"; and

WHEREAS, Airport Development Projects will require habitat protection and mitigation measures in accordance with Tumwater Municipal Code, Section 16.32.

NOW, THEREFORE, in consideration of the terms, conditions, covenants, and performance, contained herein, the PORT and the WDFW agree as follows:

1. The PORT shall continue to maintain a parcel of land between Old Highway 99 and Bonniewood Drive SE, (Attachment A) tax parcel #38400003100 (approximately 8.6 acres), as Mazama Pocket Gopher Habitat Conservation Area. This parcel is in addition to any future Mazama Pocket Gopher Habitat Conservation Area established as part of the long-range plan(s) for the airport.

2. The Mazama Pocket Gopher Habitat Conservation Area may be considered as part of a mitigation bank once established. Mitigation banking ratio shall be calculated at a future date in accordance with the Airport Master Plan Update mutually developed and agreed upon by the Federal Aviation Administration (FAA), WDFW and the PORT.

3. The Airport Five-Year Development Plan (Attachment B) includes the development projects that have been reviewed by the WDFW Prairie Science Team for potential impact to the following species: Mazama Pocket Gopher, Streaked Horned Lark, Vesper Sparrow, Taylor's Checkerspot Butterfly, Mardon Skipper Butterfly, Puget Blue Butterfly and the Valley Silverspot Butterfly.

4. The Airport Five-Year Development Projects can continue as planned in accordance with WDFW RESPONSE TO FIVE-YEAR AIRPORT MAP OF PLANNED ACTIVITIES dated August 26, 2008 (Attachment C). The requested Management Area for the Streaked Horned Lark, Vesper Sparrow and the Requested Butterfly and Prairie Habitat Area will be preserved in accordance with WDFW RESPONSE TO FIVE-YEAR AIRPORT MAP OF PLANNED ACTIVITIES until a final resolution is achieved as part of the FAA sponsored Airport Master Plan Update.

5. WDFW shall have the authorization to trap pocket gophers in project areas and relocate them without restriction. WDFW may authorize a WDFW approved third party to trap and relocate pocket gophers. WDFW shall have the authorization to monitor and survey pocket gopher habitat without restriction.

6. This agreement will be incorporated by reference in to the future Airport Master Plan Update mutually developed and agreed upon by the Federal Aviation Administration (FAA), WDFW and the Port.

7. WDFW will send the correspondence to the City of Tumwater as appropriate indicating that the conditions of this agreement satisfy the requirements of the Tumwater Municipal Code, Section 16.32 for DRC projects.

8. The term of this Agreement and the performance of the parties shall commence on the approval by the governing body of each jurisdiction. This Agreement may be amended by written agreement, or terminated by mutual agreement of the signatory agencies.

9. No change or addition to this Agreement shall be valid or binding upon either party unless such change or addition be in writing and agreed to by both parties. The governing body of each jurisdiction must approve any amendment. This Interlocal Agreement supercedes the previous INTERLOCAL AGREEMENT FOR MAZAMA POCKET GOPHER MITIGATION AT THE OLYMPIA REGIONAL AIRPORT FOR CITY OF TUMWATER DRC PROJECTS dated May 1, 2008.

10. Notice required under this Agreement will be provided by certified mail, return receipt requested. Notice required under this Agreement will be sent to:

Washington Department of Fish & Wildlife
Regional Wildlife Program Manager
Coastal & South Puget Sound Region
48 Devonshire Rd.
Montesano, WA 98563

Port of Olympia
Executive Director
915 Washington NE
Olympia, WA 98501

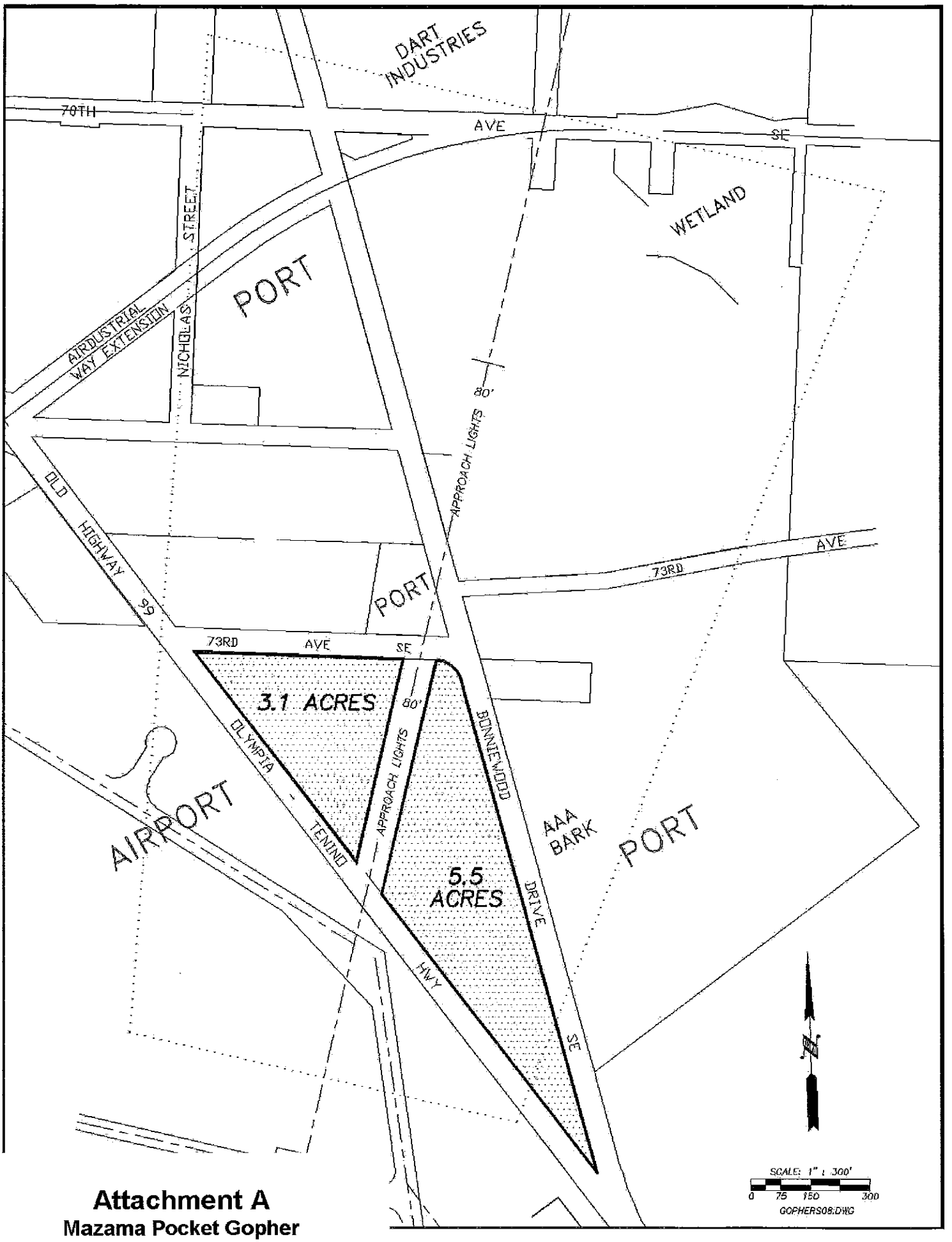
IN WITNESS WHEREOF the parties hereto have caused this Agreement to be executed the day and year first herein above written.

PORT OF OLYMPIA
915 Washington NE
Olympia, WA 98501

E. B. GALLIGAN
Executive Director

WDFW
600 Capitol Way North
Olympia, WA 98501

Steve A. Pozzanghera
Deputy Assistant Director



Attachment A
Mazama Pocket Gopher
Habitat Conservation Area

APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

ATTACHMENT TWO

Thurston County Critical Areas Ordinance

(Ordinance No. 14380)

ORDINANCE NO. 14380

AN ORDINANCE RENEWING AND AMENDING ORDINANCE NO. 14260 WHICH ESTABLISHED INTERIM REGULATIONS FOR NATIVE OUTWASH PRAIRIES AND OREGON WHITE OAK HABITAT IN CHAPTER 17.15 OF THE THURSTON COUNTY CODE, AMENDING LISTED PRAIRIE SOILS AND REVIEW EXEMPTIONS; AND CLARIFYING COMMERCIAL AND INDUSTRIAL LAND USES WITH REGARD TO IMPORTANT HABITAT AND SPECIES, AND TO PROVIDE FOR OTHER MATTERS PROPERLY RELATED THERETO.

WHEREAS, on July 28, 2009 the Board of County Commissioners of Thurston County (Board) adopted an Interim Prairie Conservation Ordinance (No. 14260), which updated development regulations for prairie and Oregon white oak habitat in the Thurston County Critical Areas Ordinance (Chapter 17.15 TCC); and

WHEREAS, pursuant to RCW 36.70A.390 and other lawful authority, the Board has the authority to enact moratoria and interim regulations; and

WHEREAS, pursuant to RCW 36.70A.390 and other lawful authority, the Board can renew moratoria and interim regulations for six (6) months following a public hearing; and

WHEREAS, RCW 36.70A.170 requires Thurston County to designate critical areas; and

WHEREAS, RCW 36.70A.060 requires Thurston County to adopt development regulations to protect designated critical areas; and

WHEREAS, according to RCW 36.70A.030 critical areas include wetlands, aquifer recharge areas, fish and wildlife habitat conservation areas; frequently flooded areas, and geologically hazardous areas; and

WHEREAS, RCW 36.70A.172 requires Thurston County to use the best available science when developing policies and development regulations to protect the functions and values of critical areas; and

WHEREAS, conserving and restoring viable populations of native species, maintaining the broad range of existing populations of healthy native plants and animals, and protecting the health of populations currently at risk is consistent with the development of critical areas regulations in Washington State; and

WHEREAS, in 1994 pursuant to RCW 36.70A.170 the Board approved Ordinance No. 10528, as amended, adopting a Critical Areas Ordinance for the reasons stated therein which are still relevant and are adopted hereto by this reference; and

WHEREAS, "Native Outwash Prairies" in Puget Trough Lowland areas have been designated as a critical area in Thurston County since 1994; and

WHEREAS, only about eight percent (8%) of the original prairie still supports grassland vegetation, and only about two to three percent (2% to 3%) is still dominated by native prairie vegetation; and

WHEREAS, less than one percent (1%) of the remaining prairie and Oregon white oak woodland habitats are protected in parks or reserves; and

WHEREAS, the principal mound-bearing prairies of the Puget Lowland are situated in Thurston County; and

WHEREAS, Mima Mounds are a unique geologic feature, which is a formation found on native prairies in Thurston County; and

WHEREAS, removing Mima Mounds may have an adverse impact on the structural complexity of the native prairie ecosystem which affects biotic interactions among species, their population dynamics, and genetic diversity; and

WHEREAS, all remaining prairies require some level of restoration and management because of actual and potential invasion of *Cystisus scoparius* (Scot's broom) and Douglas-fir; and

WHEREAS, prairie areas dominated by invasive species such as *Cystisus Scoparius* (Scot's broom) are recoverable as prairie; and

WHEREAS, the Board has received multiple public comments regarding the protection of prairie habitat in specific locations in Thurston County, including petitions with over 2,000 names, and testimony regarding the protection of prairie habitat; and

WHEREAS, immediate action is necessary to protect and conserve remaining prairies and related features such as native plants, animal species and Mima Mounds; and

WHEREAS, the Oregon white oak (*Quercus garryana*) is a designated critical habitat in Thurston County; and

WHEREAS, the State of Washington Department of Natural Resources Natural Heritage Plan 2009 Update lists the Oregon white oak (*Quercus garrana*) ecosystem as a "Priority 2" ecosystem, which means that these species or ecosystems may become endangered across their range or in Washington if factors contributing to their decline or habitat loss continue; and

WHEREAS, the Washington Department of Fish and Wildlife Comprehensive Wildlife Conservation Strategy recognizes prairie and Oregon white oak habitat as an important habitat type for at least ten animal species of greatest conservation need including the Mardon skipper, Hoary elfin, Puget blue, Talyor's checkerspot, and Valley silverspot butterflies, Mazama pocket

gopher, Western gray squirrel, Western bluebird, Oregon vesper sparrow, Streaked horned lark, and other prairie obligate species; and

WHEREAS, prairie and Oregon white oak habitat provide habitat for prairie obligate species that are listed or are candidates for listing under the Federal Endangered Species Act as an endangered or threatened species; and

WHEREAS, adopting new or revised critical areas regulations is a complex process that requires significant citizen involvement and work with stakeholders; and

WHEREAS, the amended interim regulations will remain in place while the County works with its citizens and interested parties to amend and update its Critical Areas Ordinance; and

WHEREAS, the Critical Areas Ordinance update has not been completed; and

WHEREAS, if the interim regulations governing prairies in Thurston County are not renewed prior to the adoption of the final revised Critical Areas Ordinance, prairies have the potential to be unnecessarily degraded which could lead to habitat loss for threatened and endangered species; and

WHEREAS, the initial Interim Prairie Conservation Ordinance (No. 14260) is set to expire on July 28, 2010; and

WHEREAS, the Board finds the findings of fact for Ordinance No. 14260 as adopted on July 28, 2009 are still relevant and are adopted hereto by reference, and

WHEREAS, the Board continues to find interim measures necessary to adequately preserve prairie and Oregon white oak habitat; and

WHEREAS, the Board finds it necessary to include exemptions for small lots containing prairie soil that are unlikely to contain prairie habitat due to surrounding development; and

WHEREAS, the Board finds that the regulations regarding commercial and industrial land uses within important habitat and species areas are not clear. The Board finds that commercial and industrial land uses within important habitat and species areas should undergo the same review process as other land uses listed in Table 5; and

WHEREAS, new definitions of prairie soils have been made available from the United States Fish and Wildlife Service; and

WHEREAS, the County has received a six (6) month grant from the United States Fish and Wildlife Service to update and adopt permanent regulations regarding prairies, Oregon white oak, and other environmentally important areas into the County's Critical Areas Ordinance (TCC 17.15).

NOW, THEREFORE, BE IT ORDAINED BY THE THURSTON COUNTY BOARD OF COUNTY COMMISSIONERS, AS FOLLOWS:

SECTION 1. Thurston County Ordinance 14260 is hereby renewed with additional mapping and review process amendments as provided in sections 2 through 12 of this ordinance.

SECTION 2. Section 17.15.200 "Definitions – Critical Areas, categories and terms" is hereby amended to read as follows:

17.15.200 Definitions – Critical areas, categories and terms.

The following definitions shall apply to this chapter:

....

~~"Native outwash prairies" means open areas of excessively drained soils (refer to Category I aquifer recharge areas) greater than five acres in size which are covered by native drought-resistant species of grasses, forbs, lichens, and mosses. Topography may be flat or mounded. The dominant grass species is Idaho fescue (Festuca idohoensis). Other native graminoid species often present are long-stolon sedge (Cares pensylvanica), field woodrush (Luzula campestris) and California danthonia (Danthonia californica). Other species of plants often present in various combinations are woolly sunflower (Eriophyllum lanatum), common camas (Camassia quamash), houndstounge hawkweed (Hieracium cynoglossoides), death camas (Zigadenus venenosus), dune goldenrod (Solidago spathulata), nineleaf, common and barestem lomatium (Lomatium triternatum, L. utriculata, L. nudicaule), and western buttercum (Ranunculus occidentalis). Not all species may be present at a single site. Space between grasses and forbs is generally occupied by a nearly continuous layer of mosses and lichens. Nonnative plant species may be present but do not dominate the community.~~

....

~~"Oak woodlands" means those areas where Oregon white oak (Quercus garryana) comprises more than twenty percent of the trees in a pure or mixed stand of oak or oak savannah greater than five acres in size.~~

"Oak Habitat" means stands of Oregon white oak (*Quercus garryana*) or Oregon white oak/conifer associations where canopy coverage of the oak component of the stand is twenty-five percent (25%) or more; or where total canopy coverage of the stand is less than twenty-five percent (25%), but oak accounts for at least fifty percent (50%) of the canopy coverage. The latter is often referred to as oak savanna. Oak habitat includes oak savannas and oak woodlands.

"Oak Savanna" means an Oak Habitat with a community of widely spaced Oregon white oak trees (*Quercus garryana*) where total canopy coverage is less than twenty-five percent (25%) but where Oregon white oak accounts for at least fifty percent (50%) of the canopy coverage above a layer of native prairie grasses and forbs. The spacing of these trees is widely scattered so that there is no closed canopy and groups of trees. In degraded habitat, trees may be more widely spaced above a layer of non-native vegetation on developed property.

"Oak Woodlands" means those stands of Oregon white oak (*Quercus garryana*) or Oregon white oak/conifer associations where the crown cover of the Oregon white oak component

of the stand is greater than or equal to twenty-five percent (25%). In degraded habitat, the Oregon white oak component of the stand may be less than twenty-five percent (25%), or the canopy coverage may be less than fifty percent (50%).

....

"Prairie" or "Westside Prairie," means herbaceous, non-forested (forested means greater than or equal to 60% forest canopy cover) plant communities that can either take the form of a dry prairie where soils are well-drained or a wet prairie. In parts of the Puget Trough, prairies can sometimes be recognized by mounded topography commonly referred to as Mima Mounds. Mima Mounds are a unique geologic feature of prairie habitat in Thurston County.

"Prairie, Dry" means prairies located in areas containing prairie vegetation. Although dry prairie can occur on other soils, typically it occurs on any one of the soils known to be associated with prairie (Table 13). Locations occurring on mapped prairie soils where the surface is impervious is not considered dry prairie. Certain vegetation characteristics typify dry prairie. These include the occurrence of diagnostic grasses, sedges, and forbs. Mosses, lichens, and bare ground may also be found in the spaces between grass and forbs cover.

The presence of certain diagnostic plants is required to establish an occurrence of dry prairie. In particular, three of the diagnostic grasses, sedges, or forbs (Table 14) are required to establish the presence of dry prairie.

Shrubs such as black hawthorn (*Crataegus douglasii*), kinnikinnick (*Arctostaphylos uva-ursi*), and oval-leaf viburnum (*Viburnum ellipticum*) can be found at low densities within dry prairies. Some Oregon white oak (*Quercus garryana*) can also be present in native prairie (see Oak Habitat).

Native and nonnative invasive plants typically dominate most remaining prairie. Common invasive species are Scot's broom (*Cytisus scoparius*), colonial bentgrass (*Agrostis tenuis*), common velvetgrass (*Holcus lanatus*), tall oat-grass (*Arrhenatherum elatius*), and Kentucky bluegrass (*Poa pratensis*). Other invasive grasses, forbs, and shrubs also may be present.

Marginal or fair condition areas may be dominated by non-native species with several native prairie species present (e.g. from the tables 14 and 15) or with a significant cover of native prairie species. Areas dominated by Scot's broom (non-native shrub) can be restorable to prairie if they have native prairie species in the understory. Such marginal and restorable areas may have significant value if they are large in area, located close to prairies, or in a landscape that connects two or more prairies.

"Prairie, Wet" means prairies located in areas containing prairie plants. Although wet prairie can occur on other soils, typically it occurs on any one of the soils where the surface topology and the groundwater table approach each other, and where local aquifers are present. Locations occurring on mapped prairie soils where the surface is impervious is not considered wet prairie. Wet prairies in the Puget Trough generally are found on glacial outwash soils that typically are limited to swales or low-gradient riparian areas. Three diagnostic grasses, sedges,

or forbs from a combination of the wet prairie diagnostic species list (Table 15) and the dry prairie diagnostic species list (Table 14) are required to establish the presence of wet prairie.

....

SECTION 3. Section 17.15.315 "Review Standards – Applications" is hereby amended to require an approved habitat management plan as part of a complete development application and shall read as follows:

17.15.315 Review Standards – Applications.

A. Applications to undertake a use or activity within a critical area or its buffer shall contain all information necessary to evaluate the proposed activity, its impacts, and its compliance with the provisions of this chapter, including any required special reports.

An application to undertake a use or activity on a prairie soil type shown in Table 13 or in an Oregon white oak habitat shall include submission of a special report under Section 17.15.730 TCC as determined by the review authority. No clearing, grading, or other activity shall occur prior to approval by the review authority.

....

SECTION 4. Section 17.15.710 "Important habitats and species – Allowable uses and activities" is hereby amended to include commercial and industrial land uses and shall read as follows:

17.15.710 Important habitats and species—Allowable uses and activities.

A. Those land uses and activities listed in Table 5 and commercial and industrial uses that are not listed in Table 5 are allowed in important habitat areas or within six hundred feet of a mapped point location of an important species as set forth in that table and subject to the performance standards set forth in TCC Section 17.15.715.

B. All other land uses and activities not allowed pursuant to subsection A, above, ~~Table 5~~ are prohibited.

C. Differences in regulations because of the overlap of two or more critical areas are governed by TCC Section 17.15.405.

SECTION 5. Section 17.15.715 "Important habitats and species—Performance standards for allowed uses and activities" is hereby amended to include commercial and industrial land uses not listed in Table 5 and shall read as follows:

17.15.715 Important habitats and species—Performance standard for allowed uses and activities.

To serve the purposes and provisions of this chapter, the review authority may restrict the uses and activities of a Group B development proposal for uses that are allowed under 17.15.710 ~~which are listed in Table 5~~, and lie within an important habitat or within six hundred feet of a mapped point location of an important species. The review authority will use the habitat management plan and the purposes of this chapter to evaluate the presence of the particular important habitat or species, and the likelihood that the particular important habitat or species will maintain or reproduce over the long-term.

SECTION 6. Section 17.15.720 "Buffers" is hereby amended to add decision criteria and shall read as follows:

17.15.720 Buffers.

Buffers shall be established on a case-by-case basis as described in a habitat management plan. The buffers shall reflect the sensitivity of the specific habitat and/or species to be protected. The approval authority, in consultation with the Washington Department of Fish and Wildlife, Department of Natural Resources, and United States Fish and Wildlife, shall establish buffers. When setting the buffer width, the approval authority shall consider the recommendation and supporting rationale in the applicant's habitat management plan and the following:

A. The habitat functions and their sensitivity to disturbance; and

B. The risk that the adjacent proposed land use poses for those functions including but not limited to noise, light, stormwater runoff, introduction of invasive or noxious plants, pesticides, herbicides, and domestic animals; and

C The minimum buffer width necessary to protect adjacent properties from fire management practices on prairies. If fire is included within the habitat management plan as a management tool for prairie habitat, the applicant shall:

1. Submit a fire management plan to the Thurston County Fire Marshall and the appropriate Fire District for technical review and approval; and

2. Notify the Thurston County Fire Marshall and the appropriate Fire District prior to setting fires as part of the fire management plan.

SECTION 7. Section 17.15.730 "Special reports" is hereby amended to read as follows:

17.15.730 Special reports.

A. Every development proposal for a Group B permit for uses that are allowed under 17.15.710 shall be subject to Section 17.15.735(A), if the development proposal contains ~~a use or activity subject to Table 5 located at the end of this chapter, and contains~~ either; one of the important habitats listed on Table 8 located at the end of this chapter, or is within six hundred feet of a point location of one of the important species listed on Table 9 located at the end of this chapter.

B. All proposals for land development activities, including land clearing, on a prairie soil type shown in Table 13, or in an area that could be classified as a prairie or oak habitat under this Chapter, or are within six hundred feet of those habitats, shall be subject to Section 17.15.735, except where one of the following conditions exist:

1. Permits for which there is no expansion of the structural footprint, or where there is no change in the location and area of impervious surfaces; or

2. Minor road and street improvements (refer to WAC 197-11-800(2)(c)); or

3. Developed parcels less than one (1) acre in size for which an accessory structure or an addition to the primary structure is proposed, and which are surrounded by similarly sized and similarly developed lots, where developed means the presence of a primary structure(s), with associated paving, lawns, or non-native landscaping; or

4. Vacant parcels less than one half (.5) acre in size surrounded by similar sized developed lots, where developed means the presence of a primary structure(s), with associated paving, lawns or non-native landscaping.

For the purposes of this section, a structure shall not include sheds, agriculture buildings, buildings less than two-hundred (200) square feet, or similar structures as determined by the approval authority.

SECTION 8. The Critical Areas "Tables" section is hereby amended to change the Table Inset list to add Table 13 Prairie Soils, Table 14 Diagnostic Wet Prairie Plants, and Table 15 Diagnostic Dry Prairie Plants and shall read as follows:

Table 1	Wetland Buffer Density credit
Table 2	Uses and Activities Within Aquifer Recharge Areas
Table 3	Standards for Subdivisions, Multifamily Residential and Nonresidential Projects Using On-Site Sewage Disposal

Table 4	Repealed by Ordinance 11200
Table 5	Uses and Activities Within Critical Areas and Their Buffers
Table 6	Landslide Soils of Thurston County
Table 7	Critical Facilities for Thurston County
Table 8	Important Habitats of Thurston County
Table 9	Important Species of Thurston County
Table 9.5	Critical Areas Ordinance High Ground Water Flood Areas
Table 10	Standard Wetland Buffer
Table 11	Wetland Replacement and Enhancement Ratios
Table 12	Hydric Soils of Thurston County
Table 13	Prairie Soils
Table 14	Diagnostic Wet Prairie Plants
Table 15	Diagnostic Dry Prairie Plants (Common and Rare)

SECTION 9. The Critical Areas "Table 8—Important Habitats of Thurston County" is hereby amended to read as follows:

Table 8 – Important Habitats of Thurston County

Important Habitat	Criteria	Critical Area Part
~~Native outwash prairies~~	~~Open areas of excessively drained soils (refer to Category I aquifer recharge areas) greater than 5 acres in size which are covered by native drought-resistant species of grasses, forbs, lichens and mosses. The topography may be flat or mounded. The dominant grass species is Idaho fescue (Festuca idahoensis). Other native graminoid species often present are long-stolon sedge (Carex pensylvanica), field woodrush (Luzula campestris) and California danthonia (Danthonia californica). Other species of plants often present in various combinations are woolly sunflower (Eriophyllum lanatum), common camas (Camassia quamash), houndstongue hawkweed (Hieracium cynoglossiodes), death camas (Zigadenus venenosus), dune goldenrod (Solidago spathulata), nineleaf, common and barestem lomatium (Lomatium triternatum, L. utriculata, L. nudicaule), and western buttercup (Ranunculus occidentalis). Not all species may be present at a single site. Space between grasses and forbs is generally occupied by a nearly continuous layer of mosses and lichens. Non-native plant species may be present but do not dominate the community.~~	~~700~~

Prairie, or Westside Prairie	Important prairie or westside prairie habitat means herbaceous, non-forested (forested means greater than or equal to 60% forest canopy cover) plant communities that can either take the form of a dry prairie where soils are well-drained or a wet prairie. Priority dry prairie areas have a minimum size of one acre. In addition, some areas dominated by Scot's (Scotch) Broom (non-native shrub) or other invasive species to prairies shall be considered prairie if the area is restorable and when there are native prairie species in the understory below the shrubs. Such marginal and restorable areas can be less valuable, but may have significant value if they are large in area, or in a landscape that connects two or more prairies. Small areas less than one acre with characteristics meeting the definition of prairie habitat which are functionally connected to another larger prairie habitat within approximately one half mile are also important prairie habitat areas. Mima mounds shall be preserved to the greatest practicable extent as determined by the review authority. See the definitions for prairie habitat, dry prairie, and wet prairie.	700
~~Oak woodlands~~	~~Areas where Oregon white oak (Quercus garryana) comprises more than 20 percent of the trees in pure or mix of stands of oak or oak savannah greater than five acres in size.~~	~~700~~
Oak Habitat	Important Oak Habitat means stands of Oregon white oak (*Quercus garryana*) or oak/conifer associations where canopy coverage of the oak component of the stand is twenty-five percent (25%) or more; or where total canopy coverage of the stand is less than twenty-five percent (25%), but oak accounts for at least fifty percent (50%) of the canopy coverage. The latter is often referred to as oak savanna. Important oak habitat consists of stands greater than or equal to one (1) acre (0.4 hectares) in size. Single oaks or stands less than one (1) acre (0.4 hectares) shall also be considered an important habitat when found to be particularly valuable to fish and wildlife (i.e. they contain many cavities, have a large diameter at breast height, are used by priority species, or have a large canopy), or are located in degraded habitat areas. Individual oak trees and stands of pure oak or oak conifer associations less than one (1) acre in size that are located in close proximity to an oak habitat larger than one (1) acre may also be considered an important habitat.	700

....

SECTION 10. Chapter 17.15 Critical Areas is hereby amended to add "Table 13—Prairie Soils" and shall read as follows:

Table 13—Prairie Soils

PRAIRIE SOILS	
Series Name	SCS Map Symbol #
Baldhill	5, 6, 7, 8
Cagey	20
Everett	32, 33
Grove	42
Indianola	46, 47
Nisqually	73, 74
Spana	109
Spanaway	110, 111, 112, 113, 114
Tenino	117

SECTION 11. Chapter 17.15 Critical Areas is hereby amended to add "Table 14—Diagnostic Wet Prairie Plants" and shall read as follows:

Table 14—Diagnostic Wet Prairie Plants

DIAGNOSTIC WET PRAIRIE PLANTS	
Scientific Name	Common Name
Camassia leichtlinii	giant camas
Camassia quamash	common camas
Carex densa	dense sedge *
Carex feta	green-sheath sedge
Carex tumulicola	foot-hill sedge
Carex unilateralis	one-sided sedge
Deschampsia cespitosa	tufted hairgrass
Deschampsia danthonioides	annual hairgrass
Downingia yina	Cascade downingia

Eryngium petiolatum	Oregon coyote thistle *
Lomatium bradshawii	Bradshaw's lomatium * Federally Endangered Species
Lotus pinnatus	bog bird's-foot-trefoil
Lupinus polyphyllus	large-leaf lupine
Perideridia gairdneri	Gairdner's yampah
Plagiobothrys figuratus	fragrant popcorn flower
Polemonium carneum	great polemonium *
Polygonum bistortoides	American bistort
Potentilla gracilis	graceful (fanleaf) cinquefoil
Ranunculus alismifolius	plantain-leaf buttercup
Ranunculus orthorhynchus	bird's-food buttercup
Saxifraga integrifolia	northwestern saxifrage
Saxifraga oregana	bog saxifrage
Sidalcea hirtipes	hairy-stemmed checkermallow *
Sidalcea malviflora var. *virgata*	rose checkermallow *
Sisyrinchium idahoense	Idaho blue-eyed-grass
Veratrum californicum	California false hellebore
Veratrum viride	American false hellebore
* Rare Wet Prairie Species	

SECTION 12. Chapter 17.15 Critical Areas is hereby amended to add "Table 15—Diagnostic Dry Prairie Plants" and shall read as follows:

Table 15—Diagnostic Dry Prairie Plants

Diagnostic Dry Prairie Plants (Common and Rare)	
Scientific Name	Common Name
Apocynum androsaemifolium	spreading dogbane
Balsamorhiza deltoidea	deltoid balsamroot
Brodiaea coronaria ssp. *coronaria*	harvest firecracker-flower
Camassia quamash	common camas

Carex inops ssp. *inops*	long-stolon sedge
Castilleja levisecta	golden Indian paintbrush * Federal Threatened Species
Castilleja hispida	harsh Indian paintbrush
Danthonia californica	California catgrass
Delphinium menziesii	Puget Sound larkspur
Delphinium nuttallii	upland larkspur
Dodecatheon hendersonii	Henderson's shootingstar
Erigeron speciosus	showy fleabane (aspen fleabane)
Eriophyllum lanatum var. *lanatum*	common woolly sunflower
Festuca idahoensis v. *roemeri*	Roemer's fescue
Fragaria virginiana	Virginia strawberry
Fritillaria affinis	chocolate lily
Hieracium scouleri	hound's-tongue hawkweed
Koeleria macrantha	prairie Junegrass
Linanthus bicolor	bicolored desert-gold
Lomatium triternatum	ternate desert-parsley
Lomatium utriculatum	foothills desert-parsley
Lomatium nudicaule	barestem biscuitroot
Lupinus albicaulis	sickle-keel lupine
Lupinus lepidus var. *lepidus*	prairie lupine
Microseris laciniata	cut-leaf silverpuffs
Plectritis congesta	shortspur seablush
Potentilla gracillis	fanleaf cinquefoil
Ranunculus occidentalis var. *occidentalis*	western buttercup
Saxifraga integrifolia	northwestern saxifrage
Sericocarpus rigidus	aster Curtus (white topped aster)
Silene scouleri	Scouler's catchfly
Sisyrinchium idahoense	Idaho blue-eyed-grass

Solidago missouriensis	Missouri goldenrod
Solidago simplex var. *simplex (S. Spathulata)*	sticky goldenrod
Solidago spathulata	spikelike goldenrod
Trifolium willdenowii (T. tridentatum)	springbank clover
Triteleia grandiflora	Howell's triteleia
Triteleia hyacinthina	white triteleia
Viola adunca	early blue violet (sand violet)
Viola praemorsa var. *nuttallii*	upland yellow violet
Zigadenus venenosus var. *venenosus*	meadow death-camas

SECTION 13. Duration. This ordinance shall expire six (6) months after the effective date of this ordinance, *or earlier by Board action.*

SECTION 14. Severability. If any section, subsection, sentence, clause, phrase or other portion of this Ordinance or its application to any person is, for any reason, declared invalid, illegal or unconstitutional in whole or in part by any court or agency of competent jurisdiction, said decision shall not affect the validity of the remaining portions hereof.

SECTION 15. Effective Date. This Ordinance shall take effect on July 28, 2010, the expiration date of Ordinance No. 14260.

ADOPTED: July 20, 2010

ATTEST:

Clerk of the Board

APPROVED AS TO FORM:

EDWARD G. HOLM
PROSECUTING ATTORNEY

Jeffrey G. Fancher
Deputy Prosecuting Attorney

BOARD OF COUNTY COMMISSIONERS
Thurston County, Washington

Chair

Vice-Chair

Commissioner

APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

ATTACHMENT THREE

Federal Resources Agencies MOA

Memorandum of Agreement Between
the Federal Aviation Administration,
the U.S. Air Force,
the U.S. Army,
the U.S. Environmental Protection Agency,
the U.S. Fish and Wildlife Service, and
the U.S. Department of Agriculture
to Address Aircraft-Wildlife Strikes

PURPOSE

The signatory agencies know the risks that aircraft-wildlife strikes pose to safe aviation.

This Memorandum of Agreement (MOA) acknowledges each signatory agency's respective missions. Through this MOA, the agencies establish procedures necessary to coordinate their missions to more effectively address existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety, while protecting the Nation's valuable environmental resources.

BACKGROUND

Aircraft-wildlife strikes are the second leading causes of aviation-related fatalities. Globally, these strikes have killed over 400 people and destroyed more than 420 aircraft. While these extreme events are rare when compared to the millions of annual aircraft operations, the potential for catastrophic loss of human life resulting from one incident is substantial. The most recent accident demonstrating the grievous nature of these strikes occurred in September 1995, when a U.S. Air Force reconnaissance jet struck a flock of Canada geese during takeoff, killing all 24 people aboard.

The Federal Aviation Administration (FAA) and the United States Air Force (USAF) databases contain information on more than 54,000 United States civilian and military aircraft-wildlife strikes reported to them between 1990 and 1999[1]. During that decade, the FAA received reports indicating that aircraft-wildlife strikes, damaged 4,500 civilian U.S. aircraft (1,500 substantially), destroyed 19 aircraft, injured 91 people, and killed 6 people. Additionally, there were 216 incidents where birds struck two or more engines on civilian aircraft, with damage occurring to 26 percent of the 449 engines involved in these incidents. The FAA estimates that during the same decade, civilian U.S. aircraft sustained $4 billion worth of damages and associated losses and 4.7 million hours of aircraft downtime due to aircraft-wildlife strikes. For the same period,

[1] FAA estimates that the 28,150 aircraft-wildlife strike reports it received represent less than 20% of the actual number of strikes that occurred during the decade.

USAF planes colliding with wildlife resulted in 10 Class A Mishaps[2], 26 airmen deaths, and over $217 million in damages.

Approximately 97 percent of the reported civilian aircraft-wildlife strikes involved common, large-bodied birds or large flocks of small birds. Almost 70 percent of these events involved gulls, waterfowl, and raptors (Table 1).

About 90 percent of aircraft-wildlife strikes occur on or near airports, when aircraft are below altitudes of 2,000 feet. Aircraft-wildlife strikes at these elevations are especially dangerous because aircraft are moving at high speeds and are close to or on the ground. Aircrews are intently focused on complex take-off or landing procedures and monitoring the movements of other aircraft in the airport vicinity. Aircrew attention to these activities while at low altitudes often compromises their ability to successfully recover from unexpected collisions with wildlife and to deal with rapidly changing flight procedures. As a result, crews have minimal time and space to recover from aircraft-wildlife strikes.

Increasing bird and wildlife populations in urban and suburban areas near airports contribute to escalating aircraft-wildlife strike rates. FAA, USAF, and Wildlife Services (WS) experts expect the risks, frequencies, and potential severities of aircraft-wildlife strikes to increase during the next decade as the numbers of civilian and military aircraft operations grow to meet expanding transportation and military demands.

SECTION I.

SCOPE OF COOPERATION AND COORDINATION

Based on the preceding information and to achieve this MOA's purpose, the signatory agencies:

A. Agree to strongly encourage their respective regional and local offices, as appropriate, to develop interagency coordination procedures necessary to effectively and efficiently implement this MOA. Local procedures should clarify time frames and other general coordination guidelines.

B. Agree that the term "airport" applies only to those facilities as defined in the attached glossary.

C. Agree that the three major activities of most concern include, but are not limited to:

1. airport siting and expansion;

[2] See glossary for the definition of a Class A Mishap and similar terms.

2. development of conservation/mitigation habitats or other land uses that could attract hazardous wildlife to airports or nearby areas; and

3. responses to known wildlife hazards or aircraft-wildlife strikes.

D. Agree that "hazardous wildlife" are those animals, identified to species and listed in FAA and USAF databases, that are most often involved in aircraft-wildlife strikes. Many of the species frequently inhabit areas on or near airports, cause structural damage to airport facilities, or attract other wildlife that pose an aircraft-wildlife strike hazard. Table 1 lists many of these species. It is included solely to provide information on identified wildlife species that have been involved in aircraft-wildlife strikes. It is not intended to represent the universe of species concerning the signatory agencies, since more than 50 percent of the aircraft-wildlife strikes reported to FAA or the USAF did not identify the species involved.

E. Agree to focus on habitats attractive to the species noted in Table 1, but the signatory agencies realize that it is imperative to recognize that wildlife hazard determinations discussed in Paragraph L of this section may involve other animals.

F. Agree that not all habitat types attract hazardous wildlife. The signatory agencies, during their consultative or decisionmaking activities, will inform regional and local land use authorities of this MOA's purpose. The signatory agencies will consider regional, local, and site-specific factors (e.g., geographic setting and/or ecological concerns) when conducting these activities and will work cooperatively with the authorities as they develop and implement local land use programs under their respective jurisdictions. The signatory agencies will encourage these stakeholders to develop land uses within the siting criteria noted in Section 1-3 of FAA Advisory Circular (AC) 150.5200-33 (Attachment A) that do not attract hazardous wildlife. Conversely, the agencies will promote the establishment of land uses attractive to hazardous wildlife outside those siting criteria. Exceptions to the above siting criteria, as described in Section 2.4.b of the AC, will be considered because they typically involve habitats that provide unique ecological functions or values (e.g., critical habitat for federally-listed endangered or threatened species, ground water recharge).

G. Agree that wetlands provide many important ecological functions and values, including fish and wildlife habitats; flood protection; shoreline erosion control; water quality improvement; and recreational, educational, and research opportunities. To protect jurisdictional wetlands, Section 404 of the Clean Water Act (CWA) establishes a program to regulate dredge and/or fill activities in these wetlands and navigable waters. In recognizing Section 404 requirements and the Clean Water Action Plan's goal to annually increase the Nation's net wetland acreage by 100,000 acres through 2005, the signatory agencies agree to resolve aircraft-wildlife conflicts. They will do so by

avoiding and minimizing wetland impacts to the maximum extent practicable, and will work to compensate for all associated unavoidable wetland impacts. The agencies agree to work with landowners and communities to encourage and support wetland restoration or enhancement efforts that do not increase aircraft-wildlife strike potentials.

H. Agree that the: U.S. Army Corps of Engineers (ACOE) has expertise in protecting and managing jurisdictional wetlands and their associated wildlife; U.S. Environmental Protection Agency (EPA) has expertise in protecting environmental resources; and the U.S. Fish and Wildlife Service (USFWS) has expertise in protecting and managing wildlife and their habitats, including migratory birds and wetlands. Appropriate signatory agencies will cooperatively review proposals to develop or expand wetland mitigation sites, or wildlife refuges that may attract hazardous wildlife. When planning these sites or refuges, the signatory agencies will diligently consider the siting criteria and land use practice recommendations stated in FAA AC 150/5200-33. The agencies will make every effort to undertake actions that are consistent with those criteria and recommendations, but recognize that exceptions to the siting criteria may be appropriate (see Paragraph F of this section).

I. Agree to consult with airport proponents during initial airport planning efforts. As appropriate, the FAA or USAF will initiate signatory agency participation in these efforts. When evaluating proposals to build new civilian or military aviation facilities or to expand existing ones, the FAA or the USAF, will work with appropriate signatory agencies to diligently evaluate alternatives that may avoid adverse effects on wetlands, other aquatic resources, and Federal wildlife refuges. If these or other habitats support hazardous wildlife, and there is no practicable alternative location for the proposed aviation project, the appropriate signatory agencies, consistent with applicable laws, regulations, and policies, will develop mutually acceptable measures, to protect aviation safety and mitigate any unavoidable wildlife impacts.

J. Agree that a variety of other land uses (e.g., storm water management facilities, wastewater treatment systems, landfills, golf courses, parks, agricultural or aquacultural facilities, and landscapes) attract hazardous wildlife and are, therefore, normally incompatible with airports. Accordingly, new, federally-funded airport construction or airport expansion projects near habitats or other land uses that may attract hazardous wildlife must conform to the siting criteria established in the FAA Advisory Circular (AC) 150/5200-33, Section 1-3.

K. Agree to encourage and advise owners and/or operators of non-airport facilities that are known hazardous wildlife attractants (See Paragraph J) to follow the siting criteria in Section 1-3 of AC 150/5200-33. As appropriate, each signatory agency will inform proponents of these or other land uses about the land use's potential to attract hazardous species to airport areas.

The signatory agencies will urge facility owners and/or operators about the critical need to consider the land uses' effects on aviation safety.

L. Agree that FAA, USAF, and WS personnel have the expertise necessary to determine the aircraft-wildlife strike potentials of various land uses. When there is disagreement among signatory agencies about a particular land use and its potential to attract hazardous wildlife, the FAA, USAF, or WS will prepare a wildlife hazard assessment. Then, the appropriate signatory agencies will meet at the local level to review the assessment. At a minimum, that assessment will:

1. identify each species causing the aviation hazard, its seasonal and daily populations, and the population's local movements;

2. discuss locations and features on and near the airport or land use attractive to hazardous wildlife; and

3. evaluate the extent of the wildlife hazard to aviation.

M. Agree to cooperate with the airport operator to develop a specific, wildlife hazard management plan for a given location, when a potential wildlife hazard is identified. The plan will meet applicable FAA, USAF, and other relevant requirements. In developing the plan, the appropriate agencies will use their expertise and attempt to integrate their respective programmatic responsibilities, while complying with existing laws, regulations, and policies. The plan should avoid adverse impacts to wildlife populations, wetlands, or other sensitive habitats to the maximum extent practical. Unavoidable impacts resulting from implementing the plan will be fully compensated pursuant to all applicable Federal laws, regulations, and policies.

N. Agree that whenever a significant aircraft-wildlife strike occurs or a potential for one is identified, any signatory agency may initiate actions with other appropriate signatory agencies to evaluate the situation and develop mutually acceptable solutions to reduce the identified strike probability. The agencies will work cooperatively, preferably at the local level, to determine the causes of the strike and what can and should be done at the airport or in its vicinity to reduce potential strikes involving that species.

O. Agree that information and analyses relating to mitigation that could cause or contribute to aircraft-wildlife strikes should, whenever possible, be included in documents prepared to satisfy the National Environmental Policy Act (NEPA). This should be done in coordination with appropriate signatory agencies to inform the public and Federal decision makers about important ecological factors that may affect aviation. This concurrent review of environmental issues will promote the streamlining of the NEPA review process.

P. Agree to cooperatively develop mutually acceptable and consistent guidance, manuals, or procedures addressing the management of habitats attractive to

hazardous wildlife, when those habitats are or will be within the siting criteria noted in Section 1-3 of FAA AC 5200-33. As appropriate, the signatory agencies will also consult each other when they propose revisions to any regulations or guidance relevant to the purpose of this MOA, and agree to modify this MOA accordingly.

SECTION II.
GENERAL RULES AND INFORMATION

A. Development of this MOA fulfills the National Transportation Safety Board's recommendation of November 19, 1999, to form an inter-departmental task force to address aircraft-wildlife strike issues.

B. This MOA does not nullify any obligations of the signatory agencies to enter into separate MOAs with the USFWS addressing the conservation of migratory birds, as outlined in Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, dated January 10, 2001 (66 *Federal Register*, No. 11, pg. 3853).

C. This MOA in no way restricts a signatory agency's participation in similar activities or arrangements with other public or private agencies, organizations, or individuals.

D. This MOA does not alter or modify compliance with any Federal law, regulation or guidance (e.g., Clean Water Act; Endangered Species Act; Migratory Bird Treaty Act; National Environmental Policy Act; North American Wetlands Conservation Act; Safe Drinking Water Act; or the "no-net loss" policy for wetland protection). The signatory agencies will employ this MOA in concert with the Federal guidance addressing wetland mitigation banking dated March 6, 1995 (60 *Federal Register*, No. 43, pg. 12286).

E. The statutory provisions and regulations mentioned above contain legally binding requirements. However, this MOA does not substitute for those provisions or regulations, nor is it a regulation itself. This MOA does not impose legally binding requirements on the signatory agencies or any other party, and may not apply to a particular situation in certain circumstances. The signatory agencies retain the discretion to adopt approaches on a case-by-case basis that differ from this MOA when they determine it is appropriate to do so. Such decisions will be based on the facts of a particular case and applicable legal requirements. Therefore, interested parties are free to raise questions and objections about the substance of this MOA and the appropriateness of its application to a particular situation.

F. This MOA is based on evolving information and may be revised periodically without public notice. The signatory agencies welcome public comments on this MOA at any time and will consider those comments in any future revision of this MOA.

G. This MOA is intended to improve the internal management of the Executive Branch to address conflicts between aviation safety and wildlife. This MOA does not create any right, benefit, or trust responsibility, either substantively or procedurally. No party, by law or equity, may enforce this MOA against the United States, its agencies, its officers, or any person.

H. This MOA does not obligate any signatory agency to allocate or spend appropriations or enter into any contract or other obligations.

I. This MOA does not reduce or affect the authority of Federal, State, or local agencies regarding land uses under their respective purviews. When requested, the signatory agencies will provide technical expertise to agencies making decisions regarding land uses within the siting criteria in Section 1-3 of FAA AC 150/5200-33 to minimize or prevent attracting hazardous wildlife to airport areas.

J. Any signatory agency may request changes to this MOA by submitting a written request to any other signatory agency and subsequently obtaining the written concurrence of all signatory agencies.

K. Any signatory agency may terminate its participation in this MOA within 60 days of providing written notice to the other agencies. This MOA will remain in effect until all signatory agencies terminate their participation in it.

SECTION III. PRINCIPAL SIGNATORY AGENCY CONTACTS

The following list identifies contact offices for each signatory agency.

Federal Aviation Administration
Office Airport Safety and Standards
Airport Safety and
Compliance Branch (AAS-310)
800 Independence Ave., S.W.
Washington, D.C. 20591
V: 202-267-1799
F: 202-267-7546

U.S. Air Force
HQ AFSC/SEFW
9700 Ave., G. SE, Bldg. 24499
Kirtland AFB, NM 87117
V: 505-846-5679
F: 505-846-0684

U.S. Army
Directorate of Civil Works
Regulatory Branch (CECW-OR)
441 G St., N.W.
Washington, D.C. 20314
V: 202-761-4750
F: 202-761-4150

U.S. Environmental Protection Agy.
Office of Water
Wetlands Division
Ariel Rios Building, MC 4502F
1200 Pennsylvania Ave., SW
Washington, D.C. 20460
V: 202-260-1799
F: 202-260-7546

U.S. Fish and Wildlife Service
Division of Migratory Bird Management
4401 North Fairfax Drive, Room 634
Arlington, VA 22203
V: 703-358-1714
F: 703-358-2272

U.S. Department of Agriculture
Animal and Plant Inspection Service
Wildlife Services
Operational Support Staff
4700 River Road, Unit 87
Riverdale, MD 20737
V: 301-734-7921
F: 301-734-5157

Signature Page

Associate Administrator for Airports,
Federal Aviation Administration

12/17/02
Date

Chief of Safety,
U. S. Air Force

27 May 2003
Date

Acting Assistant Secretary of the Army
(Civil Works)
Department of the Army

December 9, 2002
Date

Assistant Administrator, Office of Water,
U.S. Environmental Protection Agency

1/17/03

Assistant Director, Migratory Birds
and State Programs,
U.S. Fish and Wildlife Service

7/29/03
Date

Acting Deputy Administrator, Wildlife Services
U.S. Department of Agriculture

09 January 2003
Date

GLOSSARY

This glossary defines terms used in this MOA.

Airport. All USAF airfields or all public use airports in the FAA's National Plan of Integrated Airport Systems (NPIAS). Note: There are over 18,000 civil-use airports in the U.S., but only 3,344 of them are in the NPIAS and, therefore, under FAA's jurisdiction.

Aircraft-wildlife strike. An aircraft-wildlife strike is deemed to have occurred when:

1. a pilot reports that an aircraft struck 1 or more birds or other wildlife;
2. aircraft maintenance personnel identify aircraft damage as having been caused by an aircraft-wildlife strike;
3. personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;
4. bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified; or
5. the animal's presence on the airport had a significant, negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal)

(Source: *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

Aircraft-wildlife strike hazard. A potential for a damaging aircraft collision with wildlife on or near an airport (14 CFR 139.3).

Bird Sizes. Title 40, Code of Federal Regulations, Part 33.76 classifies birds according to weight:

small birds weigh less than 3 ounces (oz).
medium birds weigh more than 3 oz and less than 2.5 lbs.
large birds weigh greater than 2.5 lbs.

Civil aircraft damage classifications. The following damage descriptions are based on the *Manual on the International Civil Aviation Organization Bird Strike Information System*:

Minor: The aircraft is deemed airworthy upon completing simple repairs or replacing minor parts and an extensive inspection is not necessary.

Substantial: Damage or structural failure adversely affects an aircraft's structural integrity, performance, or flight characteristics. The damage normally requires major repairs or the replacement of the entire affected component. Bent fairings or cowlings; small dents; skin punctures; damage to wing tips, antenna, tires or brakes, or engine blade damage not requiring blade replacement are specifically excluded.

Destroyed: The damage sustained makes it inadvisable to restore the aircraft to an airworthy condition.

Significant Aircraft-Wildlife Strikes. A significant aircraft-wildlife strike is deemed to have occurred when any of the following applies:

1. a civilian, U.S. air carrier aircraft experiences a multiple aircraft-bird strike or engine ingestion;
2. a civilian, U.S. air carrier aircraft experiences a damaging collision with wildlife other than birds; or
3. a USAF aircraft experiences a Class A, B, or C mishap as described below:

    A. **Class A Mishap:** Occurs when at least one of the following applies:
        1. total mishap cost is $1,000,000 or more;
        2. a fatality or permanent total disability occurs; and/or
        3. an Air Force aircraft is destroyed.
    B. **Class B Mishap:** Occurs when at least one of the following applies:
        1. total mishap cost is $200,000 or more and less than $1,000,000; and/or
        2. a permanent partial disability occurs and/or 3 or more people are hospitalized;
    C. **Class C Mishap:** Occurs when at least one of the following applies:
        1. cost of reported damage is between $20,000 and $200,000;
        2. an injury causes a lost workday (i.e., duration of absence is at least 8 hours beyond the day or shift during which mishap occurred); and/or
        3. an occupational illness causing absence from work at any time.

Wetlands. An ecosystem requiring constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or

near the surface and the presence of physical, chemical, and biological features indicating recurrent, sustained inundation, or saturation. Common diagnostic wetland features are hydric soils and hydrophytic vegetation. These features will be present, except where specific physiochemical, biotic, or anthropogenic factors have removed them or prevented their development.

(Source the 1987 Delineation Manual; 40 CFR 230.3(t)).

Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring there of (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this MOA, "wildlife" includes feral animals and domestic animals while out of their owner's control (14 CFR 139.3, *Certification and Operations: Land Airports Serving CAB-Certificated Scheduled Air Carriers Operating Large Aircraft (Other Than Helicopters)*)

Table 1. Identified wildlife species, or groups, that were involved in two or more aircraft-wildlife strikes, that caused damage to one or more aircraft components, or that had an adverse effect on an aircraft's flight. Data are for 1990-1999 and involve only civilian, U.S. aircraft.

Birds	No. reported strikes
Gulls (all spp.)	874
Geese (primarily, Canada geese)	458
Hawks (primarily, Red-tailed hawks)	182
Ducks (primarily Mallards.)	166
Vultures (primarily, Turkey vulture)	142
Rock doves	122
Doves (primarily, mourning doves)	109
Blackbirds	81
European starlings	55
Sparrows	52
Egrets	41
Shore birds (primarily, Killdeer & Sandpipers)	40
Crows	31
Owls	24
Sandhill cranes	22
American kestrels	15
Great blue herons	15
Pelicans	14
Swallows	14
Eagles (Bald and Golden)	14
Ospreys	13
Ring-necked pheasants	11
Herons	11
Barn-owls	9
American robins	8
Meadowlarks	8
Buntings (snow)	7
Cormorants	6
Snow buntings	6
Brants	5
Terns (all spp.)	5
Great horned owls	5
Horned larks	4
Turkeys	4
Swans	3
Mockingbirds	3
Quails	3
Homing pigeons	3
Snowy owls	3
Anhingas	2

Ravens	2
Kites	2
Falcons	2
Peregrine falcons	2
Merlins	2
Grouse	2
Hungarian partridges	2
Spotted doves	2
Thrushes	2
Mynas	2
Finches	2
Total known birds	2,612

Mammals	**No. reported strikes**
Deer (primarily, White-tailed deer)	285
Coyotes	16
Dogs	10
Elk	6
Cattle	5
Bats	4
Horses	3
Pronghorn antelopes	3
Foxes	2
Raccoons	2
Rabbits	2
Moose	2
Total known mammals	340

Ring-billed gulls were the most commonly struck gulls. The U.S. ring-billed gull population increased steadily at about 6% annually from 1966-1988. Canada geese were involved in about 90% of the aircraft-goose strikes involving civilian, U.S. aircraft from 1990-1998. Resident (non-migratory) Canada goose populations increased annually at 13% from 1966-1998. Red-tailed hawks accounted for 90% of the identified aircraft-hawk strikes for the 10-year period. Red-tailed hawk populations increased annually at 3% from 1966 to 1998. Turkey vultures were involved in 93% of he identified aircraft-vulture strikes. The U.S. Turkey vulture populations increased at annually at 1% between 1966 and 1998. Deer, primarily white-tailed deer, have also adapted to urban and airport areas and their populations have increased dramatically. In the early 1900's, there were about 100,000 white-tailed deer in the U.S. Current estimates are that the U.S. population is about 24 million.

U.S. Department
of Transportation

**Federal Aviation
Administration**

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS

Date: 5/1/97

AC No: 150/5200-33

Initiated by: AAS-310 and APP-600

Change:

1. PURPOSE. This advisory circular (AC) provides guidance on locating certain land uses having the potential to attract hazardous wildlife to or in the vicinity of public-use airports. It also provides guidance concerning the placement of new airport development projects (including airport construction, expansion, and renovation) pertaining to aircraft movement in the vicinity of hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICATION. The standards, practices, and suggestions contained in this AC are recommended by the Federal Aviation Administration (FAA) for use by the operators and sponsors of all public-use airports. In addition, the standards, practices, and suggestions contained in this AC are recommended by the FAA as guidance for land use planners, operators, and developers of projects, facilities, and activities on or near airports.

3. BACKGROUND. Populations of many species of wildlife have increased markedly in the last few years. Some of these species are able to adapt to human-made environments, such as exist on and around airports. The increase in wildlife populations, the use of larger turbine engines, the increased use of twin-engine aircraft, and the increase in air-traffic, all combine to increase the risk, frequency, and potential severity of wildlife-aircraft collisions.

Most public-use airports have large tracts of open, unimproved land that are desirable for added margins of safety and noise mitigation. These areas can present potential hazards to aviation because they often attract hazardous wildlife. During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives world-wide, as well as billions of dollars worth of aircraft damage. Hazardous wildlife attractants near airports could jeopardize future airport expansion because of safety considerations.

DAVID L. BENNETT
Director, Office of Airport Safety and Standards

SECTION 1. HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. TYPES OF HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS. Human-made or natural areas, such as poorly-drained areas, retention ponds, roosting habitats on buildings, landscaping, putrescible-waste disposal operations, wastewater treatment plants, agricultural or aquacultural activities, surface mining, or wetlands, may be used by wildlife for escape, feeding, loafing, or reproduction. Wildlife use of areas within an airport's approach or departure airspace, aircraft movement areas, loading ramps, or aircraft parking areas may cause conditions hazardous to aircraft safety.

All species of wildlife can pose a threat to aircraft safety. However, some species are more commonly involved in aircraft strikes than others. Table 1 lists the wildlife groups commonly reported as being involved in damaging strikes to U.S. aircraft from 1993 to 1995.

Table 1. Wildlife Groups Involved in Damaging Strikes to Civilian Aircraft, USA, 1993-1995.

Wildlife Groups	Percent involvement in reported damaging strikes
Gulls	28
Waterfowl	28
Raptors	11
Doves	6
Vultures	5
Blackbirds-Starlings	5
Corvids	3
Wading birds	3
Deer	11
Canids	1

1-2. LAND USE PRACTICES. Land use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife-aircraft collisions. FAA recommends against land use practices, within the siting criteria stated in 1-3, that attract or sustain populations of hazardous wildlife within the vicinity of airports or cause movement of hazardous wildlife onto, into, or across the approach or departure airspace, aircraft movement area, loading ramps, or aircraft parking area of airports.

Airport operators, sponsors, planners, and land use developers should consider whether proposed land uses, including new airport development projects, would increase the wildlife hazard. Caution should be exercised to ensure that land use practices on or near airports do not enhance the attractiveness of the area to hazardous wildlife.

1-3. SITING CRITERIA. FAA recommends separations when siting any of the wildlife attractants mentioned in Section 2 or when planning new airport development projects to accommodate aircraft movement. The distance between an airport's aircraft movement areas, loading ramps, or aircraft parking areas and the wildlife attractant should be as follows:

a. Airports serving piston-powered aircraft. A distance of 5,000 feet is recommended.

b. Airports serving turbine-powered aircraft. A distance of 10,000 feet is recommended.

c. Approach or Departure airspace. A distance of 5 statute miles is recommended, if the wildlife attractant may cause hazardous wildlife movement into or across the approach or departure airspace.

SECTION 2. LAND USES THAT ARE INCOMPATIBLE WITH SAFE AIRPORT OPERATIONS.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment are highly variable and may depend on several factors, including land-use practices on or near the airport. It is important to identify those land use practices in the airport area that attract hazardous wildlife. This section discusses land use practices known to threaten aviation safety.

2-2. PUTRESCIBLE-WASTE DISPOSAL OPERATIONS. Putrescible-waste disposal operations are known to attract large numbers of wildlife that are hazardous to aircraft. Because of this, these operations, when located within the separations identified in the sitting criteria in 1-3 are considered incompatible with safe airport operations.

FAA recommends against locating putrescible-waste disposal operations inside the separations identified in the siting criteria mentioned above. FAA also recommends against new airport development projects that would increase the number of aircraft operations or that would accommodate larger or faster aircraft, near putrescible-waste disposal operations located within the separations identified in the siting criteria in 1-3.

2-3. WASTEWATER TREATMENT FACILITIES. Wastewater treatment facilities and associated settling ponds often attract large numbers of wildlife that can pose a threat to aircraft safety when they are located on or near an airport.

a. New wastewater treatment facilities. FAA recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in the siting criteria in 1-3. During the siting analysis for wastewater treatment facilities, the potential to attract hazardous wildlife should be considered if an airport is in the vicinity of a proposed site. Airport operators should voice their opposition to such sitings. In addition, they should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

b. Existing wastewater treatment facilities. FAA recommends correcting any wildlife hazards arising from existing wastewater treatment facilities located on or near airports without delay, using appropriate wildlife hazard mitigation techniques. Accordingly, measures to minimize hazardous wildlife attraction should be developed in consultation with a wildlife damage management biologist. FAA recommends that wastewater treatment facility operators incorporate appropriate wildlife hazard mitigation techniques into their operating practices. Airport operators also should encourage those operators to incorporate these mitigation techniques in their operating practices.

c. Artificial marshes. Waste-water treatment facilities may create artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. FAA recommends against establishing artificial marshes within the separations identified in the siting criteria stated in 1-3.

d. Wastewater discharge and sludge disposal. FAA recommends against the discharge of wastewater or sludge on airport property. Regular spraying of wastewater or sludge disposal on unpaved areas may improve soil moisture and quality. The resultant turf growth requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw. The maimed or flushed organisms and the straw can attract hazardous wildlife and jeopardize aviation safety. In addition, the improved turf may attract grazing wildlife such as deer and geese.

Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

e. Underwater waste discharges. The underwater discharge of any food waste, e.g., fish processing offal, that could attract scavenging wildlife is not recommended within the separations identified in the siting criteria in 1-3.

2-4. WETLANDS.

a. Wetlands on or near Airports.

(1) Existing Airports. Normally, wetlands are attractive to many wildlife species. Airport operators with wetlands located on or nearby airport property should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations.

(2) Airport Development. When practicable, the FAA recommends siting new airports using the separations identified in the siting criteria in 1-3. Where alternative sites are not practicable or when expanding existing airports in or near wetlands, the wildlife hazards should be evaluated and minimized through a wildlife management plan prepared by a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service (USFWS) and the U.S. Army Corps of Engineers (COE).

NOTE: If questions exist as to whether or not an area would qualify as a wetland, contact the U.S. Army COE, the Natural Resource Conservation Service, or a wetland consultant certified to delineate wetlands.

b. Wetland mitigation. Mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects. Wetland mitigation should be designed so it does not create a wildlife hazard.

(1) FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in the siting criteria in 1-3. Wetland mitigation banks meeting these siting criteria offer an ecologically sound approach to mitigation in these situations.

(2) Exceptions to locating mitigation activities outside the separations identified in the siting criteria in 1-3 may be considered if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge. Such mitigation must be compatible with safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife should be avoided. On-site mitigation plans may be reviewed by the FAA to determine compatibility with safe airport operations.

(3) Wetland mitigation projects that are needed to protect unique wetland functions (see 2-4.b.(2)), and that must be located in the siting criteria in 1-3 should be identified and evaluated by a wildlife damage management biologist before implementing the mitigation. A wildlife damage management plan should be developed to reduce the wildlife hazards.

NOTE: AC 150/5000-3, *Address List for Regional Airports Division and Airports District/Field Offices*, provides information on the location of these offices.

2-5. DREDGE SPOIL CONTAINMENT AREAS. FAA recommends against locating dredge spoil containment areas within the separations identified in the siting criteria in 1-3, if the spoil contains material that would attract hazardous wildlife.

SECTION 3. LAND USES THAT MAY BE COMPATIBLE WITH SAFE AIRPORT OPERATIONS.

3-1. GENERAL. Even though they may, under certain circumstances, attract hazardous wildlife, the land use practices discussed in this section have flexibility regarding their location or operation and may even be under the airport operator's or sponsor's control. In general, the FAA does not consider the activities discussed below as hazardous to aviation if there is no apparent attraction to hazardous wildlife, or wildlife hazard mitigation techniques are implemented to deal effectively with any wildlife hazard that may arise.

3-2. ENCLOSED WASTE FACILITIES. Enclosed trash transfer stations or enclosed waste handling facilities that receive garbage indoors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles, generally would be compatible, from a wildlife perspective, with safe airport operations, provided they are not located on airport property or within the runway protection zone (RPZ). No putrescible-waste should be handled or stored outside at any time, for any reason, or in a partially enclosed structure accessible to hazardous wildlife.

Partially enclosed operations that accept putrescible-waste are considered to be incompatible with safe airport operations. FAA recommends these operations occur outside the separations identified in the siting criteria in 1-3.

3-3. RECYCLING CENTERS. Recycling centers that accept previously sorted, non-food items such as glass, newspaper, cardboard, or aluminum are, in most cases, not attractive to hazardous wildlife.

3-4. COMPOSTING OPERATIONS ON AIRPORTS. FAA recommends against locating composting operations on airports. However, when they are located on an airport, composting operations should not be located closer than the greater of the following distances: 1,200 feet from any aircraft movement area, loading ramp, or aircraft parking space; or the distance called for by airport design requirements. This spacing is intended to prevent material, personnel, or equipment from penetrating any Obstacle Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway (see AC 150/5300-13, *Airport Design*). On-airport disposal of compost by-products is not recommended for the reasons stated in 2-3.d.

a. Composition of material handled. Components of the compost should never include any municipal solid waste. Non-food waste such as leaves, lawn clippings, branches, and twigs generally are not considered a wildlife attractant. Sewage sludge, wood-chips, and similar material are not municipal solid wastes and may be used as compost bulking agents.

b. Monitoring on-airport composting operations. If composting operations are to be located on airport property, FAA recommends that the airport operator monitor composting operations to ensure that steam or thermal rise does not affect air traffic in any way. Discarded leaf disposal bags or other debris must not be allowed to blow onto any active airport area. Also, the airport operator should reserve the right to stop any operation that creates unsafe, undesirable, or incompatible conditions at the airport.

3-5. ASH DISPOSAL. Fly ash from resource recovery facilities that are fired by municipal solid waste, coal, or wood, is generally considered not to be a wildlife attractant because it contains no putrescible matter. FAA generally does not consider landfills accepting only fly ash to be wildlife attractants, if those landfills: are maintained in an orderly manner; admit no putrescible-waste of any kind; and are not co-located with other disposal operations.

Since varying degrees of waste consumption are associated with general incineration, FAA classifies the ash from general incinerators as a regular waste disposal by-product and, therefore, a hazardous wildlife attractant.

3-6. CONSTRUCTION AND DEMOLITION (C&D) DEBRIS LANDFILLS. C&D debris (Class IV) landfills have visual and operational characteristics similar to putrescible-waste disposal sites. When co-located with putrescible-waste disposal operations, the probability of hazardous wildlife attraction to C&D landfills increases because of the similarities between these disposal activities.

FAA generally does not consider C&D landfills to be hazardous wildlife attractants, if those landfills: are maintained in an orderly manner; admit no putrescible-waste of any kind; and are not co-located with other disposal operations.

3-7. WATER DETENTION OR RETENTION PONDS. The movement of storm water away from runways, taxiways, and aprons is a normal function on most airports and is necessary for safe aircraft operations. Detention ponds hold storm water for short periods, while retention ponds hold water indefinitely. Both types of ponds control runoff, protect water quality, and can attract hazardous wildlife. Retention ponds are more attractive to hazardous wildlife than detention ponds because they provide a more reliable water source.

To facilitate hazardous wildlife control, FAA recommends using steep-sided, narrow, linearly-shaped, rip-rap lined, water detention basins rather than retention basins. When possible, these ponds should be placed away from aircraft movement areas to minimize aircraft-wildlife interactions. All vegetation in or around detention or retention basins that provide food or cover for hazardous wildlife should be eliminated.

If soil conditions and other requirements allow, FAA encourages the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

3-8. LANDSCAPING. Wildlife attraction to landscaping may vary by geographic location. FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. All landscaping plans should be reviewed by a wildlife damage management biologist. Landscaped areas should be monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be implemented immediately.

3-9. GOLF COURSES. Golf courses may be beneficial to airports because they provide open space that can be used for noise mitigation or by aircraft during an emergency. On-airport golf courses may also be a concurrent use that provides income to the airport.

Because of operational and monetary benefits, golf courses are often deemed compatible land uses on or near airports. However, waterfowl (especially Canada geese) and some species of gulls are attracted to the large, grassy areas and open water found on most golf courses. Because waterfowl and gulls occur throughout the U.S., FAA recommends that airport operators exercise caution and consult with a wildlife damage management biologist when considering proposals for golf course construction or expansion on or near airports. Golf courses should be monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be implemented immediately.

3-10. AGRICULTURAL CROPS. As noted above, airport operators often promote revenue-generating activities to supplement an airport's financial viability. A common concurrent use is agricultural crop production. Such use may create potential hazards to aircraft by attracting wildlife. Any proposed on-airport agricultural operations should be reviewed by a wildlife damage management biologist. FAA generally does not object to agricultural crop production on airports when: wildlife hazards are not predicted; the guidelines for the airport areas specified in 3-10.a-f. are observed; and the agricultural operation is closely monitored by the airport operator or sponsor to ensure that hazardous wildlife are not attracted.

NOTE: If wildlife becomes a problem due to on-airport agricultural operations, FAA recommends undertaking the remedial actions described in 3-10.f.

a. Agricultural activities adjacent to runways. To ensure safe, efficient aircraft operations, FAA recommends that no agricultural activities be conducted in the Runway Safety Area (RSA), OFA, and the OFZ (see AC 150/5300-13).

b. Agricultural activities in areas requiring minimum object clearances. Restricting agricultural operations to areas outside the RSA, OFA, OFZ, and Runway Visibility Zone (RVZ) (see AC 150/5300-13) will normally provide the minimum object clearances required by FAA's airport design standards. FAA recommends that farming operations not be permitted within areas critical to the proper operation of localizers, glide slope indicators, or other visual or electronic navigational aids. Determinations of minimal areas that must be kept free of farming operations should be made on a case-by-case basis. If navigational aids are present, farm leases for on-airport agricultural activities should be coordinated with FAA's Airway Facilities Division, in accordance with FAA Order 6750.16, *Siting Criteria for Instrument Landing Systems.*

NOTE: Crop restriction lines conforming to the dimensions set forth in Table 2 will normally provide the minimum object clearance required by

FAA airport design standards. The presence of navigational aids may require expansion of the restricted area.

c. Agricultural activities within an airport's approach areas. The RSA, OFA, and OFZ all extend beyond the runway shoulder and into the approach area by varying distances. The OFA normally extends the farthest and is usually the controlling surface. However, for some runways, the TSS (see AC 150/5300-13, Appendix 2) may be more controlling than the OFA. The TSS may not be penetrated by any object. The minimum distances shown in Table 2 are intended to prevent penetration of the OFA, OFZ, or TSS by crops or farm machinery.

NOTE: Threshold Siting standards should not be confused with the approach areas described in Title 14, Code of Federal Regulations, Part 77, (14 CFR 77), *Objects Affecting Navigable Airspace.*

d. Agricultural activities between intersecting runways. FAA recommends that no agricultural activities be permitted within the RVZ. If the terrain is sufficiently below the runway elevation, some types of crops and equipment may be acceptable. Specific determinations of what is permissible in this area requires topographical data. For example, if the terrain within the RVZ is level with the runway ends, farm machinery or crops may interfere with a pilot's line-of-sight in the RVZ.

e. Agricultural activities in areas adjacent to taxiways and aprons. Farming activities should not be permitted within a taxiway's OFA. The outer portions of aprons are frequently used as a taxilane and farming operations should not be permitted within the OFA. Farming operations should not be permitted between runways and parallel taxiways.

f. Remedial actions for problematic agricultural activities. If a problem with hazardous wildlife develops, FAA recommends that a professional wildlife damage management biologist be contacted and an on-site inspection be conducted. The biologist should be requested to determine the source of the hazardous wildlife attraction and suggest remedial action. Regardless of the source of the attraction, prompt remedial actions to protect aviation safety are recommended. The remedial actions may range from choosing another crop or farming technique to complete termination of the agricultural operation.

Whenever on-airport agricultural operations are stopped due to wildlife hazards or annual harvest, FAA recommends plowing under all crop residue and harrowing the surface area smooth. This will reduce or eliminate the area's attractiveness to foraging wildlife. FAA recommends that this requirement be written into all on-airport farm use contracts and clearly understood by the lessee.

Table 2. Minimum Distances Between Certain Airport Features And Any On-Airport Agriculture Crops.

Aircraft Approach Category And Design Group [1]	Distance In Feet From Runway Centerline To Crop		Distance In Feet From Runway End To Crop		Distance In Feet From Centerline Of Taxiway To Crop	Distance In Feet From Edge Of Apron To Crop
	Visual & ≥ ¾ mile	< ¾ mile	Visual & ≥ ¾ mile	< ¾ mile		
Category A & B Aircraft						
Group I	200 [2]	400	300[3]	600	45	40
Group II	250	400	400[3]	600	66	58
Group III	400	400	600	800	93	81
Group IV	400	400	1,000	1,000	130	113
Category C, D & E Aircraft						
Group I	530[3]	575[3]	1,000	1,000	45	40
Group II	530[3]	575[3]	1,000	1,000	66	58
Group III	530[3]	575[3]	1,000	1,000	93	81
Group IV	530[3]	575[3]	1,000	1,000	130	113
Group V	530[3]	575[3]	1,000	1,000	160	138
Group VI	530[3]	575[3]	1,000	1,000	193	167

1. Design Groups are based on wing span, and Category depends on approach speed of the aircraft.

Group I: Wing span up to 49 ft.	Category A: Speed less than 91 knots
Group II: Wing span 49ft. up to 78 ft.	Category B: Speed 91 knots up to 120 knots
Group III: Wing span 79 ft. up to 117 ft.	Category C: Speed 121 knots up to 140 knots
Group IV: Wing span 118 ft. up to 170 ft.	Category D: Speed 141 knots up to 165 knots
Group V: Wing span 171 ft. up to 213 ft.	Category E: Speed 166 knots or more
Group VI: Wing span 214 ft. up to 261 ft.	

2. If the runway will only serve small airplanes (12,500 lb. And under) in Design Group I, this dimension may be reduced to 125 feet; however, this dimension should be increased where necessary to accommodate visual navigational aids that may be installed. For example farming operations should not be allowed within 25 feet of a Precision Approach Path Indicator (PAPI) light box.

3. These dimensions reflect the TSS as defined in AC 150/5300-13, Appendix 2. The TSS cannot be penetrated by any object. Under these conditions, the TSS is more restrictive than the OFA, and the dimensions shown here are to prevent penetration of the TSS by crops and farm machinery.

SECTION 4. NOTIFICATION OF FAA ABOUT HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AN AIRPORT.

4-1. GENERAL. Airport operators, land developers, and owners should notify the FAA in writing of known or reasonably foreseeable land use practices on or near airports that either attract or may attract hazardous wildlife. This section discusses those notification procedures.

4-2. NOTIFICATION REQUIREMENTS FOR WASTE DISPOSAL SITE OPERATIONS. The Environmental Protection Agency (EPA) requires any operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, section 258.10, *Airport Safety*). The EPA also requires owners or operators of new municipal solid waste landfill (MSWLF) units, or lateral expansions of existing MSWLF units that are located within 10,000 feet of any airport runway end used by turbojet aircraft or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft.

a. Timing of Notification. When new or expanded MSWLFs are being proposed near airports, MSWLF operators should notify the airport operator and the FAA of this as early as possible pursuant to 40 CFR Part 258. Airport operators should encourage the MSWLF operators to provide notification as early as possible.

NOTE: AC 150/5000-3 provides information on these FAA offices.

b. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, the ability to sustain a reduction in the numbers of hazardous wildlife to levels that existed before a putrescible-waste landfill began operating has not been successfully demonstrated. For this reason, demonstrations of experimental wildlife control measures should not be conducted in active aircraft operations areas.

c. Other Waste Facilities. To claim successfully that a waste handling facility sited within the separations identified in the siting criteria in 1-3 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 3-2. FAA requests that waste site developers provide a copy of an official permit request verifying that the facility will not handle putrescible material other than that as outlined in 3-2. FAA will use this information to determine if the facility will be a hazard to aviation.

4-3. NOTIFYING FAA ABOUT OTHER WILDLIFE ATTRACTANTS. While U. S. EPA regulations require landfill owners to provide notification, no similar regulations require notifying FAA about changes in other land use practices that can create hazardous wildlife attractants. Although it is not required by regulation, FAA requests those proposing land use changes such as those discussed in 2-3, 2-4, and 2-5 to provide similar notice to the FAA as early in the development process as possible. Airport operators that become aware of such proposed development in the vicinity of their airports should also notify the FAA. The notification process gives the FAA an opportunity to evaluate the effect of a particular land use change on aviation safety.

The land use operator or project proponent may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents to notify the appropriate FAA Regional Airports Division Office.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land use operator or project proponent should also forward specific details of the proposed land use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

4-5. FAA REVIEW OF PROPOSED LAND USE CHANGES.

a. The FAA discourages the development of facilities discussed in section 2 that will be located within the 5,000/10,000-foot criteria in 1-3.

b. For projects which are located outside the 5,000/10,000-foot criteria, but within 5 statute miles of the airport's aircraft movement areas, loading ramps, or aircraft parking areas, FAA may review development plans, proposed land use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. Sensitive airport areas will be identified as those that lie under or next to approach or departure airspace. This brief examination should be sufficient to determine if further investigation is warranted.

c. Where further study has been conducted by a wildlife damage management biologist to evaluate a site's compatibility with airport operations, the FAA will use the study results to make its determination.

d. FAA will discourage the development of any excepted sites (see Section 3) within the criteria specified in 1-3 if a study shows that the area supports hazardous wildlife species.

4-6. AIRPORT OPERATORS. Airport operators should be aware of proposed land use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in the siting criteria in 1-3. Particular attention should be given to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas.

a. AIP-funded airports. FAA recommends that operators of AIP-funded airports, to the extent practicable, oppose off-airport land use changes or practices (within the separations identified in the siting criteria in 1-3) that may attract hazardous wildlife. Failure to do so could place the airport operator or sponsor in noncompliance with applicable grant assurances. FAA recommends against the placement of airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants. Airport operators, sponsors, and planners should identify wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

b. Additional coordination. If, after the initial review by FAA, questions remain about the existence of a wildlife hazard near an airport, the airport operator or sponsor should consult a wildlife damage management biologist. Such questions may be triggered by a history of wildlife strikes at the airport or the proximity of the airport to a wildlife refuge, body of water, or similar feature known to attract wildlife.

c. Specialized assistance. If the services of a wildlife damage management biologist are required, FAA recommends that land use developers or the airport operator contact the appropriate state director of the United States Department of Agriculture/Animal Damage Control (USDA/ADC), or a consultant specializing in wildlife damage management. Telephone numbers for the respective USDA/ADC state offices may be obtained by contacting USDA/ADC's Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157. The ADC biologist or consultant should be requested to identify and quantify wildlife common to the area and evaluate the potential wildlife hazards.

d. Notifying airmen. If an existing land use practice creates a wildlife hazard, and the land use practice or wildlife hazard cannot be immediately eliminated, the airport operator should issue a Notice to Airmen (NOTAM) and encourage the land owner or manager to take steps to control the wildlife hazard and minimize further attraction.

APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. GENERAL. This appendix provides definitions of terms used throughout this AC.

a. Aircraft movement area. The runways, taxiways, and other areas of an airport which are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft exclusive of loading ramps and aircraft parking areas.

b. Airport operator. The operator (private or public) or sponsor of a public use airport.

c. Approach or departure airspace. The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

d. Concurrent use. Aeronautical property used for compatible non-aviation purposes while at the same time serving the primary purpose for which it was acquired; and the use is clearly beneficial to the airport. The concurrent use should generate revenue to be used for airport purposes (see Order 5190.6A, *Airport Compliance Requirements*, sect. 5h).

e. Fly ash. The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

f. Hazardous wildlife. Wildlife species that are commonly associated with wildlife-aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a wildlife-aircraft strike hazard.

g. Piston-use airport. Any airport that would primarily serve FIXED-WING, piston-powered aircraft. Incidental use of the airport by turbine-powered, FIXED-WING aircraft would not affect this designation. However, such aircraft should not be based at the airport.

h. Public-use airport. Any publicly owned airport or a privately-owned airport used or intended to be used for public purposes.

i. Putrescible material. Rotting organic material.

j. Putrescible-waste disposal operation. Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

k. Runway protection zone (RPZ). An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the design aircraft, type of operation, and visibility minimum.

l. Sewage sludge. The de-watered effluent resulting from secondary or tertiary treatment of municipal sewage and/or industrial wastes, including sewage sludge as referenced in U.S. EPA's *Effluent Guidelines and Standards*, 40 C.F.R. Part 401.

m. Shoulder. An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface, support for aircraft running off the pavement, enhanced drainage, and blast protection (see AC 150/5300-13).

n. Turbine-powered aircraft. Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

o. Turbine-use airport. Any airport that ROUTINELY serves FIXED-WING turbine-powered aircraft.

p. Wastewater treatment facility. Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 C.F. R. Section 403.3 (o), (p), & (q)).

q. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring there of (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, WILDLIFE includes feral animals and domestic animals while out of the control of their owners (14 CFR 139.3, *Certification and Operations: Land Airports Serving CAB-Certificated Scheduled Air Carriers Operating Large Aircraft (Other Than Helicopters)*).

r. Wildlife attractants. Any human-made structure, land use practice, or human-made or natural geographic feature, that can attract or sustain hazardous wildlife within the landing or departure airspace, aircraft movement area, loading ramps, or aircraft parking areas of an airport. These attractants can include but are not limited to architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquacultural activities, surface mining, or wetlands.

s. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport (14 CFR 139.3).

2. RESERVED.

APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

ATTACHMENT FOUR
FAA & WS MOU

No. 12-34-71-0003-MOU

Memorandum of Understanding
between the
United States Department of Transportation
Federal Aviation Administration
and the
United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

ARTICLE 1

This Memorandum of Understanding (MOU) continues the cooperation between the Federal Aviation Administration and Wildlife Services (WS) for mitigating wildlife hazards to aviation.

ARTICLE 2

The FAA has the broad authority to regulate and develop civil aviation in the United States[1]. The FAA may issue Airport Operating Certificates to airports serving certain air carrier aircraft. Issuance of an Airport Operating Certificate indicates that the airport meets the requirements of Title 14, Code of Federal Regulations, part 139 (14 CFR 139) for conducting certain air carrier operations.

The WS has the authority to enter agreements with States, local jurisdictions, individuals, public and private agencies, organizations, and institutions for the control of nuisance wildlife[2]. The WS also has the authority to charge for services provided under such agreements and to deposit the funds collected into the accounts that incur the costs[3].

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[1] Federal Aviation Act of 1958, 49 U.S.C. § 40101, et. seq.

[2] The Animal Damage Control Act of March 2, 1931, as amended, 46 Stat. 1468; 7 U.S.C. 426 – 426b.

[3] The Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, as amended, 426c to U.S.C. 426 – 426b.

14 CFR 139.337 requires the holder of an Airport Operating Certificate (certificate holder) to conduct a wildlife hazard assessment (WHA) when specific events occur on or near the airport. A wildlife management biologist who has professional training and/or experience in wildlife hazard management at airports, or someone working under the direct supervision of such an individual, must conduct the WHA required by 14 CFR 139.337. The FAA reviews all WHAs to determine if the certificate holder must develop and implement a wildlife hazard management plan (WHMP) designed to mitigate wildlife hazards to aviation on or near the airport. These regulations also require airport personnel implementing an FAA-approved WHMP to receive training conducted by a qualified wildlife damage management biologist.

ARTICLE 3

The FAA and the WS agree to the following.

a. The WS has the professional expertise, airport experience, and training to provide support to assess and reduce wildlife hazards to aviation on and near airports. The WS can also provide the necessary training to airport personnel.

b. Most airports lack the technical expertise to identify underlying causes of wildlife hazard problems. They can control many of their wildlife problems following proper instruction in control techniques and wildlife species identification from qualified wildlife management biologists.

c. Situations arise where control of hazardous wildlife is necessary on and off airport property (i.e., roost relocations, reductions in nesting populations, and removal of wildlife). This often requires the specialized technical support of WS personnel.

d. The FAA or the certificate holder may seek technical support from WS to lessen wildlife hazards. This help may include, but is not limited to, conducting site visits and WHAs to identify hazardous wildlife, their daily

and seasonal movement patterns and habitat requirements. WS personnel may also provide:

i. support with developing WHMPs including recommendations on control and habitat management methods designed to minimize the presence of hazardous wildlife on or near the airport;

ii. training in wildlife species identification and the use of control devices;

iii. support with managing hazardous wildlife and associated habitats; and

iv. recommendations on the scope of further studies necessary to identify and minimize wildlife hazards.

e. Unless specifically requested by the certificate holder, WS is not liable or responsible for development, approval, or implementation of a WHMP required by 14 CFR 139.337. Development of a WHMP is the responsibility of the certificate holder. The certificate holder will use the information developed by WS from site visits and/or conducting WHA in the preparation of a WHMP.

f. The FAA and WS agree to meet at least yearly to review this agreement, identify problems, exchange information on new control methods, identify research needs, and prioritize program needs.

ARTICLE 4

The WS personnel will advise the certificate holder of their responsibilities to secure necessary permits and/or licenses for control of wildlife. This will ensure all wildlife damage control activities are conducted under applicable Federal, State, and local laws and regulations.

ARTICLE 5

This MOU defines in general terms, the basis on which the parties will cooperate and does not constitute a financial obligation to serve as a basis for expenditures. Request for technical, operational, or research assistance that requires cooperative or reimbursable funding will be completed under a separate agreement.

ARTICLE 6

This MOU will supersede all existing MOUs, supplements, and amendments about the conduct of wildlife hazard control programs between WS and the FAA.

ARTICLE 7

Under Section 22, Title 41, U.S.C., no member of or delegate to Congress will be admitted to any share or part of this MOU or to any benefit to arise from it.

ARTICLE 8

This MOU will become effective on the date of final signature and will continue indefinitely. This MOU may be amended by agreement of the parties in writing. Either party, on 60 days advance written notice to the other party, may end the agreement.

_____ OSB Woodie Woodward _____ Date ___ June 20, 2005 _____
Associate Administrator for Airports
Federal Aviation Administration

_____ OSB William H Clay _____ Date ___ June 27, 2005 _____
Deputy Administrator for Wildlife Services
Animal and Plant Health Inspection Service

APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

ATTACHMENT FIVE

General Information on Endangered, Threatened, and Candidate Species found at Olympia Regional Airport

MAZAMA POCKET GOPHER *(Thomomys mazama)*

Listing Status

The Mazama pocket gopher was listed in March 2006 as a State Threatened species. This species became a Federal candidate for listing on 30 October 2001, with its status being proposed for elevation to Federal Threatened on 11 December 2012. Before the State listing, the Mazama pocket gopher was protected under Tumwater Municipal Code 16.32.050-- *Habitats Defined and Protected* as a locally significant habitat and species. After State listing, the City of Tumwater protects the Mazama pocket gopher under Tumwater Municipal Code 16.32.050(B) as a State Threatened species and defers to the WDFW for concurrence.

Under RCW 77.15.120, the State of Washington protects State listed species from take, but does not protect habitat. The City of Tumwater protects habitat under Chapter 16.32.

General Information

Mazama pocket gophers are small (body ~5.5 in) fossorial (live in underground burrows) herbivorous rodents with short-necked stocky bodies, narrow hips, and short legs. They have cheek pouches that open on the sides of their mouth, which are used for storing and transporting food. They have small ears and small bead-like eyes. Their front feet are equipped with strong claws and their digits and palms are bordered with a fringe of stiff bristles (Verts and Carraway, 1998). Their tails are short (~2.5 in) and nearly naked. *T. mazama* is a relatively small pocket gopher, smaller than the species commonly found in eastern Washington.

In contrast, moles (family *Talpidae*) are insectivores and lack the prominent gnawing teeth exhibited by pocket gophers and other rodents. Moles also have a pointed snout and front claws that differ substantially from pocket gophers. Since both moles and pocket gophers are seldom seen above-ground, most people only see their mounds left on the surface.

Species Diet and Foraging.

Pocket gophers eat a wide variety of roots and above-ground plant parts. The Mazama pocket gopher is known to consume clover (*Trifolium* spp.), lupines (*Lupinus* spp.), false dandelions (presumably *Hypochaerus radicata*), and grasses. *T. mazama* forages in the evening on the surface close to their burrows (Stinson, 2005). Food caches consist of roots of cat's ear (*Hypochaeris radiata*), Gairdner's yampah (*Perideridia gairdneri*), bracken fern (*Pteridium aquilinum*), camas bulbs (Scheffer, 1995), and quackgrass (*Agropyron repens*).

Feeding preferences may change with availability (Stinson, 2005). The annual diet of *T. mazama* consisted of aboveground parts of forbs and grasses (40% and 32%, respectively) and 24% roots (Stinson, 2005). The diet of *T. mazama* consists of 60% grasses in the winter and 16.6% grasses in the summer (Verts and Carraway, 2000). In less preferred habitats, food cache chambers usually contained a single type of root, often thistles (*Cirsium spp.)* or Scotch broom

(Witmer *et al.*, 1996). Scotch broom is probably not a preferred food, since gophers typically are not numerous where Scotch broom is abundant (Steinberg, 1996a).

Habitat requirements and Ecology.

Mazama pocket gophers need open meadows, prairie, or grassland habitat with friable soils that are not too rocky. In general, pocket gophers prefer soils that are light-textured, porous, well-drained, and do not occur in peat or heavy clay (Chase *et al.*, 1982). Research suggests that the highest gopher densities occur in sites with dark-colored, light-textured soils vegetated with grasses and forbs, especially succulent forbs with underground storage structures.

Occupied sites in Washington include remnant native prairie and historic prairie that has been converted to airport margins, fallow fields, and Christmas tree farms, occasionally pocket gopher are found in clear-cuts, a situation that appears to be more prevalent in counties historically having small patches of prairie in otherwise timbered areas (e.g. Clallum and Mason counties; pers. com. Tirhi). Provided a source population is available, Mazama pocket gophers may invade an area when the forest cover has been removed; as grass and forbs increase, gophers can become abundant within a few years unless or until the area regenerates to forest (Stinson, 2005).

Pocket gophers require malleable soils to excavate tunnels. During the summer months when soils are dry, new tunnels tend to cave in, hindering tunnel and mound building activity. This is analogous to building a sand castle using dry sand. Rain moistens the soils, making the soil structure more amenable for tunneling. The best digging conditions occur when the soil moisture is at 10 to 20% (Stinson, 2005). Pocket gophers may increase tunnel maintenance activities to repair tunnels that cave in under dry soil conditions, possibly increasing the number of surface mounds.

A greater frequency of mound building activities may occur during or following rain events. Pocket gophers appear to occur in lower densities in areas of thick scotch broom. Research on Fort Lewis showed that pocket gophers did not occur in areas of dense Scotch Broom cover (Steinberg, 1995).

Pocket gopher populations are reported to undergo occasional extreme fluctuations (Case *et al.*, 1982) and are characterized by local extinction and re-colonization (Baker *et al.* 2003). Territoriality and extreme weather may influence pocket gopher populations more than any other factors. Pocket gophers are not long-lived and many live only to one year. Research has concluded that the maximum age reached by the Mazama pocket gopher is 4 to 5 years with an average of 2 years, although many in the studies did not survive longer than one year (Stinson, 2005).

Gopher Habitat.

The Mazama pocket gopher prefers prairie habitat. Historically, the Native Americans maintained prairie habitat in western Washington through burning shrubs and tree cover. Native Americans harvested camas and other crops, which grew abundantly on western Washington prairies. With the arrival of white settlers, prescribed burning by Native Americans ceased, and settlers began to convert prairie to farms and expand forestry through seed planting. Currently, only scattered remnants of historic prairie remain in western Washington. Some of these historical prairie systems are now zoned as urban growth areas by local counties and cities.

Gopher Mounds.

The Mazama pocket gopher produces characteristically crescent-shaped mounds of soil above the ground. Typically, mounds have a plug of soil closing the burrow entrance at the periphery of the crescent-shaped mound. Mounds are typically low to the ground and in scatter formation on the surface, in contrast to the taller conical-shaped mole mounds that typically form lines following tunnel formations.

Mound Identification.

Because moles often create mounds interspersed with gopher mounds, species-specific mound identification is an essential component of the study. Moles and pocket gophers live their lives almost completely underground. Their tunneling activity results in mounds of dirt being excavated and left on the surface. Fortunately, mole and pocket gopher mounds can be identified in the field by easily observable characteristics. Basically, moles create round or conical-shaped mounds in contrast to the crescent or kidney shaped mound of the pocket gopher. Another key difference is that moles create surface tunnels, scars seen from the surface housing very shallow tunnels, whereas, the Mazama pocket gopher is not known to create surface tunnels. The entrance to the mole tunnel system is in the center of the conical-shaped mound, while the entrance for the pocket gopher tunnel is beneath a plug located on the inner side of the crescent-shaped mound. Gophers finely sift the soil when creating mounds whereas mole mounds tend to be clumpier in comparison.

Gopher Dispersion and Home Range.

Pocket gopher ranges generally do not overlap because one species will competitively exclude the other (Chase *et al.*, 1982; Verts and Carraway, 2000). They are usually not represented by more than one species at any one site. Mazama pocket gophers are patchily distributed in open non-forested habitats in parts of western Washington (Stinson, 2005).

Juvenile gophers move far distances approximately100-300 m (328-984 ft) (Vaughan, 1963) and Anderson and MacMahon, 1981) and may triple the number of burrow systems in one Spring (Steinberg 1996a). The increased gopher activity in the spring and the high mortality rate of gophers in general (up to 75% in one study ; Hansen, 1960) suggests that the number of mounds created may not be a good indicator of population estimates. The presence of mounds is typically used to determine the extent of the area used by gophers. Females produce an annual

average litter size of 5 offspring during the October through June breeding season (University of Michigan Museum of Zoology, http://animaldiversity.ummz.umish.edu/site/accounts/informational/thomomys_mazama.htm). Gestation takes 1 month and then shortly after, the juveniles leave their natal brooding chamber to seek their own territory. The gopher's relatively short lifespan creates an urgency to find territory and reproduce. Individuals with the best territory presumably have a better mating success, resulting in a clustering of territories that comprise the colony. Pocket gophers reach sexual maturity within one season and the average life span extends only 2 years (Maximum life span 5 years for males & 4 years for females).

Juvenile pocket gophers can wander from the natal burrow system almost 1,000 feet in search of individual territory. Daly and Patton (1990) reported that vacant habitat within a few hundred meters is rapidly colonized. They further reported that 20% of juveniles wandered 120 to 300 feet of their natal territory. About half of that percentage moved up to 1000 feet or more of their natal territory. Juvenile pocket gophers occasionally disperse above ground from their natal burrows (Chase *et al.*, 1982). Most gophers that disperse far from their home range are males, as typical in small rodents (Stinson, 2005). After several generations of these short-lived rodents (within several years), dispersion could extend a mile or more from the original natal territory.

Males and females both defend territories. The home range of males ranges from 73 (786 sf) to 143 m^2 (1,539 sf) of area, while that of females ranges from 47 (506 sf) to 150 m^2 (1,615 sf) of area (Verts and Carraway, 2000). The area encompassing an individual's territory varies greatly, depending on the age of the gopher, resources available, suitable soil conditions, and other factors. Gophers are relatively solitary with exception during breeding season (which may occur from October to June) when males and females can be found in the same tunnel system.

Mazama pocket gopher is polygynous in that males will mate with multiple females that enter the male's burrow system during breeding season. The larger size of males prevents them from entering the smaller burrow systems tunneled by females. Hence, females choose males by entering the male's burrow system (territory). An individual territory is sedentary once established. Territories are clustered in preferred areas favored for bountiful resources and suitable environmental factors. The close proximity of individual territories forming a colony allows for breeding success and for re-occupying abandoned tunnel systems.

The Mazama pocket gopher averaged 20 individual gophers per acre in (location ?), which was considered by the author to be a dense gopher colony (Stinson, 2005). Other studies estimated approximately 11 individual gophers per acre (Smallwood and Morrison, 1999). The larger the study area, density tends to decrease because the gophers tend to cluster unevenly in high density colonies Smallwood and Morrison (1999) pointed out that the conventional study method is to estimate density for a dense cluster of gophers (colony); however, as the study plot size increases, more gopher-free area is included and estimated density decreases. Thereby, because of the

uneven, patch-like distribution of gophers on the land, increased survey areas generally decreases gopher density estimates, considering that the initial sample size is that of a dense colony.

Mazama Pocket Gophers on and in Vicinity of Airport

PE Consultants LLC has evaluated a number of properties for the Mazama pocket gopher in the vicinity of the Airport. Some of the studies have been submitted to the City of Tumwater as a part of environmental requirements associated with permitting, and thereby, there studies are public record. Other studies have not been published and are preparatory information. However, this sensitive information will be disseminated responsibly considering its preparatory nature.

In 2004, PE Consultants LLC performed a Mazama pocket gopher study on a 118-acre site south of the Airport across 89th Avenue SE. The subsequent Habitat Protection Plan is dated 11 March 2005. This project has been named the Sagewood Development. Another 40-acre parcel also was evaluated at the same time adjacent to Sagewood. More than 13 years prior to the study, the two sites had been cleared of forest for pastureland. Forest cover in this area is typical of historic prairie in which trees have colonized prairie habitat through natural fire prevention. Forest cover is typically sparse with areas of open canopy. It is presumed that the Mazama pocket gopher colonized the sites within those subsequent years.

Gopher mounds were found in an uneven, patchy distribution of clusters, presumably colonies. PE Consultants LLC prepared a mitigation plan for both parcels separately that would enhance existing habitat. Soils were amended to a texture and consistency more favorable for pocket gopher habitation. Weed maintenance included performance measures to manage Scot's broom and other invasive plants. As part of the mitigation measures, Mazama pocket gophers were relocated by WDFW from the colonies to be impacted by development to Wolf Haven, Tenino under a research scenario to determine if translocation of gophers was feasible. Also as a mitigation measure, intensive livestock grazing had been eliminated from the site, which may have affected the pocket gopher population and distribution. Gophers were translocated from the larger development plot (e.g. Tumwater Industrial Complex) to Wolf Haven over three different periods. Several years of monitoring by WDFW staff of the Wolf Haven translocation have shown that gophers can be successfully translocated. However, WDFW believes that success has resulted from repeated translocation of animals and the addition of new animals to the site. Successful translocation appears unlikely if gophers are moved only once.

The Olympia Airport and some surrounding properties contain very dense populations of gophers, probably as a result of preferred soils and good food supplies. Gophers are less dense on other properties throughout the range of the gopher.

STREAKED HORNED LARK *(Eremophila alpestris strigata)*

Listing Status

The Streaked horned lark is a State Endangerd and Federal Candidate species. The streaked horned lark became a federal candidate species in 2001 and state listed as endangered in 2006(USFWS, 2007). The species was proposed for elevation to Federal Threatened status on 11 October 2012.

General Information

Horned larks (*Eremophila alpestris*) are small, ground-dwelling birds, approximately 16–20 centimeters (6–8 inches) in length (Beason, 1995). Adults are pale brown, but shades of brown vary geographically among the subspecies and the face has a yellow wash. Adults have a black bib, black whisker marks, and black feather tufts that resemble "horns" and can be raised or lowered. Tail feathers are with white margins. Juveniles are colored varying shades of gray and lack the black face pattern.

The streaked horned lark (*Eremophila alpestris strigata*) has a dark brown dorsal surface, yellowish underparts, a walnut brown nape and yellow eyebrow stripe and throat (Beason, 1995). The combination of small size, dark brown back, and yellow on the underparts seems to distinguish this race from all others. The streaked horned lark is one of 21 subspecies in North America and 15 subspecies in western North America (Beason, 1995). Genetic studies by Drovetski *et al.* (2005) clearly defined these subspecies at the genetics level.

The streaked horned lark nests on rocky ground in sparsely vegetated sites containing short herbaceous vegetation (< 30 cm tall) dominated by grasses and forbs (Pearson, 2003; Pearson and Hopey, 2005; Altman, 1999). The particular plant species association seems to be of less importance than specific microhabitat conditions (Altman, 1999; Rogers, 1999b).

Historically, this habitat type was much more abundant in the Puget lowlands and the outer coast of Washington (Jewett *et al.,* 1953). Its historic breeding range included prairies and open grassland habitats in southwestern British Columbia, western Washington, and western Oregon. The center of abundance of the streaked horned lark in Washington was the prairies of southern Puget Sound, primarily in Pierce and Thurston counties (Stinson, D. W. 2005. Washington State Status Report for the Mazama Pocket Gopher, Streaked Horned Lark, and Taylor's Checkerspot. Washington Department of Fish and Wildlife, Olympia. 129+ xii pp.).

Streak horned lark preferred habitat includes prairies in western Oregon and Washington, as well as sandy beaches, dunes, fallow agricultural fields, grazed pastures, seasonal mud-flats, and gravel bars and dredge spoils on the Columbia River (Altman 1999; Rogers 1999; Pearson 2003; Pearson and Hopey 2005; Pearson and Altman 2005).

Streaked horned lark breeding in Washington is now limited to only 13 known sites: 6 sites in the south Puget Sound area, 4 sites along the outer coast, and 3 sites on islands in the lower Columbia River. The subspecies has also greatly declined in Oregon and may be extinct in British Columbia. The total breeding population is estimated to be 780, with about 330 birds in Washington and about 450 in Oregon (Stinson 2005). Some streaked horned larks over-winter along the coast and lower Columbia River of Washington and in the Willamette Valley of Oregon (Pearson and Altman 2005b). The primary cause of decline appears to be the loss of habitat (USFWS, March 2008), low hatchability of nests and adult mortality (M. Tirhi pers. Comm.). Only 10 percent of the historic prairie is considered intact in the south Puget Sound region where most of Washington's prairies historically occurred (Altman, 2000). Dams on the Columbia River control water levels allowing willow and other plants to cover the bare gravel bar habitat used for nesting. Although the species may nest on dredge spoils, nests also can be covered by spoils if dredging activities occur during the breeding season.

All remaining nesting sites in the south Puget Sound area are on airports or military bases where grassland has been maintained, but where larks are subject to disturbance and human-related mortality, and where their habitat is threatened with development or incompatible use. Horned larks are among the species most frequently killed by collisions with military aircraft. Columbia River sites are affected by management of the islands, including deposition of dredge spoil, and vegetation manipulation to discourage nesting by Caspian terns. Coastal sites are affected by the spread of European beachgrass and disturbance by recreational activities (Stinson 2005).

OREGON VESPER SPARROW (*Pooecetes gramineus affinis*)

Listing Status

The Streaked horned lark is a State Candidate and Federal Species of Concern.

General Information

The vesper sparrow (*Pooecetes gramineus*) is a medium-sized sparrow that is the only member of the genus *Pooecetes*. They have a white eye ring and a long dark brown tail which shows white outer feathers in flight. Vesper sparrows west of the Cascades have a pinkish hue and are smaller and browner than eastern Washington birds. Vesper sparrows are the only nesting sparrows of the open, low valleys of Washington that display white outer tail feathers in flight. This characteristic, along with the chestnut patch occasionally visible on the bend of the wing, distinguishes it from other local sparrows.

The vesper sparrow is found in many open upland habitats, including roadside ditches, prairies, grassy or weedy fields, dry grasslands, sagebrush, and agricultural fields at low to moderate elevations. This species forages on the ground for insects mainly in the summer and for seeds mainly in the winter. Outside the nesting season they often feed in small flocks.

The vesper sparrow breeding habitat consists of open grassy areas. The nest is an open cup on the ground under a clump of grass. Breeding season occurs from May through July. The female typically lays 3-5 eggs in mid-May, and incubates them for 11-13 days. The young fledge in 7-12 days, and pairs commonly raise two broods per season. The male sings from a higher perch, such as a shrub or fencepost, announcing his nesting territory. The musical song begins with two pairs of repeated whistled notes and ends in a series of trills. During courtship, the male walks or runs along the ground with his wings raised and his tail spread widely, then periodically rises into the air to give a short flight-song.

The vesper sparrow is often seen in loose flocks before fall migration. They spend most of their time on the ground and take frequent dust baths. Males sing from the highest perches in their territories--often a fence post, shrub, or tree limb. The female has been known to protect the nest by dragging her leg or wing in a distraction display when threatened.

The vesper sparrow winters in the southern to east-central U.S. south to the Gulf Coast and central Mexico. West of the Cascades, the vesper sparrow arrives in early April. Two subspecies of vesper sparrow occur in Washington, divided by the Cascades. The subspecies found west of the Cascades (*Pooecetes gramineus affinis*) is rare and declining locally. This population may be in danger of extirpation in Washington due to loss of prairie habitat converted to residential areas, farmland, shrubs, and forest.

Small populations of vesper sparrow occur in the open prairies around the southern end of Puget Sound and in grassy, weedy areas along salt water. Western Washington populations may be found in Dungeness (Clallam County) (although this population may be extirpated), San Juan Island (San Juan County), the Chambers Lake area, Weir Prairie, and various remnant prairie sites in Pierce and Thurston County including Scatter Creek Wildlife Recreation Area.

BUTTERFLIES

The Management Recommendations for Washington's Priority Species Volume I: Invertebrates (WDFW, 1995) indicates that the loss of habitat caused by human activities and the application of insecticides is the primary threat to diminishing butterfly populations. The most common causes of butterfly habitat loss and human-caused mortality are development, logging, grazing, impoundments, and the use of herbicides. Insecticide use, including those applications targeting spruce budworm and gypsy moth, as well as drift from agricultural pesticides applications, undoubtedly affect non-target insect populations. Butterfly collectors may also have had an impact on local butterfly populations.

Taylor's Checkerspot

Taylor's checkerspot (*Euphydryas editha taylori*) is a subspecies of Edith's checkerspot. The name "checkerspot" is derived from the checkerboard pattern on the upperside of the butterfly's wings.

The butterfly is a medium-sized species with a striking checkered pattern of orange to brick red, black and cream.

Three other subspecies of *E. editha* also occur in Washington: *beani, edithana*, and *colonia* (Stinson, 2005). Historically, Taylor's checkerspot was found on grassland habitats at over 70 sites from southeastern Vancouver Island, British Columbia through northwestern Oregon, including about 38 known locations in Washington (WDFW, 1995). Historically, Taylor's checkerspot may have been abundant throughout southeast Vancouver Island, and the Willamette Valley of Oregon (Stinson, 2005). This subspecies is now restricted to 1 known population in British Columbia, small populations in 2 areas in Oregon, and a small scattering of 10 populations in Washington.

Butterfly populations are known to fluctuate dramatically with weather. Taylor's checkerspot occurs in metapopulations where larvae race to develop before their food plants dry out in early summer. The larvae do not survive if they do not mature sufficiently before entering a prolonged diapause which extends through winter. This species is relatively sedentary and rarely disperses > 5 km. Because this species occurs in metapopulations that are precariously dependent on weather conditions, local habitat conditions, and the condition of host plants, local populations sometimes go extinct and the habitat is vacant until being recolonized by dispersing adults.

Host plants include native seaside plantain (*Plantago maritima macrocarpa*), and non-native English plantain (*P. lanceolata*). Some populations appear to be dependent on the non-native plantain species English plantain (*Plantago lanceolata*). Dependence on non-native plantain negatively affects the Taylor's checkerspot population dynamics and may lead to more frequent local extinctions (Stinson, 2005).

The life cycle of Taylor's checkerspot lasts about one year, but only a week or two of this is spent as an adult. Taylor's checkerspot is univoltine (single generation per year) and considered nonmigratory. In any given population, adults emerge over a one to several week period. The time during which adult butterflies are present is referred to as the flight period. The Taylor's checkerspot has one brood and there is a single annual flight when adults emerge to mate and lay eggs. They are one of the first butterflies to appear in the spring. The flight period in Washington is typically mid-April through May, with a peak in early May (Stinson, 2005).

Taylor's checkerspot was historically found in San Juan County, Whidbey Island in Island County, the Straits of Juan de Fuca in Clallam County, and on prairies in Thurston, Mason, Pierce and Lewis counties. Several of these populations now seem to be extinct. Taylor's checkerspot is currently known to occur at only 10 Washington sites that include the Olympia Regional Airport. Surveys conducted in 2011 found no Taylor Checkerspots on the Olympia Airport.

Puget Blue

The Washington distribution is considered this subspecies' general range. Small concentrations occur in the Tenino Prairies of western Washington.

Puget blue butterflies are colonial and not usually rare where they occur. Their habitat in Washington includes forest clearings with a presence of lupine (*Lupinus spp.*), Puget lowland prairies and their forest edges, powerline cuts, and unsprayed railroad rights-of-way. Known host plants for this Washington endemic include broadleaf lupine (*Lupinus latifolius*) and probably other lupine species.

Land development, intensive fertilizing, grazing, agriculture, forest succession, and railroad right-of-way spraying threaten Puget blue butterflies.

Management recommendations include the maintenance of lupine stands and control of shrub/forest succession by cutting and/or burning. Adults can and will disperse to nearby patches of lupine. Therefore, the direct planting of lupines could be an effective management measure.

The Puget blue is restricted to a very limited number of lowland habitats under pressure from human expansion. Fortunately the best colony occurs on a Nature Conservancy Preserve, but additional habitat should be set aside and measures enhanced for survey and management.

WDFW management recommendations include: 1) maintain lupine stands and control succession by cutting and/or burning, 2) planting native lupines, 3) discontinue spraying railroad right-of ways.

Valley Silverspot

The Washington distribution includes declining concentrations in the San Juan Islands, Puget Trough, northeastern Olympics, Willapa Hills, and western Cascades. Formerly, this subspecies' overall range extended to the Willamette Valley in Oregon where it now appears to be extirpated.

This highly localized and often abundant butterfly uses open prairies, arctic-alpine tundra, subalpine glades, and mid-elevation roadsides and clearings. The only known host plant is the western blue violet, *Viola adunca*.

Development activities within habitats, grazing, fertilization and other agricultural practices, logging and associated reduction of floristic diversity, succession of prairies, and aerially applied herbicides within forestlands threaten valley silverspot butterflies.

WDFW Management Recommendations include 1) reduce the use of chemicals during forest practices, 2) maintain early plant community succession, and to 3) monitor Olympic Mountains, Willapa Hills, and Puget Trough populations individually.

Mardon Skipper

This species occurs in western Washington, southwestern Oregon, and northwestern California. The Washington distribution includes small concentrations which occur in the Tenino Prairies and south-central Cascades (Thurston, Yakima, and Klickitat counties).

The mardon skipper is endemic to the Pacific Northwest. It primarily inhabits open grasslands on glacial outwash prairies, as well as openings and ridgetops within ponderosa pine (*Pinus ponderosa*) woodlands. Idaho fescue (*Festuca idahoensis*) is the suspected host plant.

Factors that degrade mardon skipper obligate grasslands limit this species. In addition, development, overgrazing, fertilization, herbicide application, the introduction of plants such as Scots broom, and natural succession within forest communities threaten mardon skipper butterflies.

Management Recommendations include 1) maintain stands of Idaho fescue and promote western blue violet (*Viola adunca*) as a nectar source, 2) research incremental fire and mowing management techniques, as should further life history requisites of this species. This butterfly was formerly considered to be Washington's only endemic butterfly species. The Washington distribution is disjunct between the Tenino Prairies and the southern Cascades. No records have been found between the two. This species is of great scientific and evolutionary interest.

APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

ATTACHMENT SIX

FAA Certalert No. 06-07

CERTALERT

ADVISORY CAUTIONARY NON-DIRECTIVE
AIRPORT SAFETY AND OPERATIONS DIVISION AAS-300

FOR INFORMATION, CONTACT Ed Cleary, AAS-300, (202) 267-3389

Date: **11/21/2006** **No. 06-07**

To: **Airport Operators, FAA Airport Certification Safety Inspectors**

Topic: **Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports**

PURPOSE:

This Certalert describes procedures for responding to requests by state wildlife agencies to facilitate and encourage habitats for state-listed threatened and endangered species or species of special concern that occur on airports and may pose a threat to aviation safety. This Certalert does not apply to federally listed threatened and endangered species. Federal Aviation Administration (FAA) guidance on dealing with federally listed threatened and endangered species can be found in FAA Order 1050.1E, *Environmental Impacts - Policies and Procedures*, Appendix A, Section 8.

BACKGROUND:

An airport's air operations area (AOA) is an artificial environment that has been created and maintained for aircraft operations. Because an AOA can be markedly different from the surrounding native landscapes, it may attract wildlife species that do not normally occur, or that occur only in low numbers in the area. Some of the grassland species attracted to an airport's AOA are at the edge of their natural ranges, but are attracted to habitat features found in the airport environment. Also, some wildlife species may occur on the airport in higher numbers than occur naturally in the region because the airport offers habitat features the species prefer. Some of these wildlife species are state-listed threatened and endangered species or have been designated by state resource agencies as species of special concern.

Many state wildlife agencies have requested that airport operators facilitate and encourage habitat on airports for state-listed threatened and endangered species or species of special concern. Airport operators should exercise great caution in adopting new management techniques; new techniques may increase wildlife hazards and be inconsistent with safe airport operations. Managing the on-airport environment to facilitate or encourage the presence of hazardous wildlife species can create conditions that are incompatible with, or pose a threat to, aviation safety.

DISCUSSION:

Hazardous wildlife are those species of wildlife (50 CFR 10.12), including feral animals and domesticated animals not under control (14 CFR 139.5, Definitions), that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard. (FAA Advisory Circular 150/5200-33A, *Hazardous Wildlife Attractants on or Near Airports*, July 27, 2004.) Not all state-listed threatened and endangered species or species of concern pose a direct threat to aviation safety. However, these species may pose an indirect threat and be hazardous because they attract other wildlife species or support prey species attractive to other species that are directly hazardous. Also, the habitat management practices that benefit these state-listed threatened and endangered species and species of special concern may attract other hazardous wildlife species. For example, the grassland habitat preferred by grasshopper sparrows, which are listed as threatened in New York[1], also supports a wide variety of insects and small mammals. These insects and small mammals are an indirect threat to aviation safety because they are very attractive to hawks, owls, gulls and other birds. It is these large birds that can pose a direct threat to aviation safety. On-airport habitat and wildlife management practices designed to benefit wildlife that directly or indirectly create safety hazard where none existed before are incompatible with safe airport operations.

Airport operators must decline to adopt habitat management techniques that jeopardize aviation safety. Adopting such techniques could place them in violation of their obligations and subject to an FAA enforcement action and possible civil penalties under 49 U.S.C. §44706, as implemented by 14 CFR § 139.337. In particular, an airport operator that has received federal grant-in-aid assistance is obligated through its grant assurances to maintain compatible land uses. Failure to do so may lead to noncompliance with its grant obligations. Further, airports that serve commercial air carriers are required to be certificated under 49 U.S.C. §44706, as implemented by 14 CFR Part 139. Title 14 CFR § 139.337(a) requires airport operators holding a Part 139 certificate to "take immediate action to alleviate wildlife hazards whenever they are detected." Accordingly, Part 139-certificated airport operators should make state wildlife agencies aware of the airport's FAA-approved Wildlife Hazard Management Plan (WHMP), AC 150/5200-33A, and the joint FAA-Wildlife Services manual, *Wildlife Hazard Management at Airports* (6/05) (joint FAA/WS manual). Before making any changes in land management practices, the airport operator should carefully review the above documents to assure that any changes are consistent with its obligations under federal law to control wildlife hazards and attractants in the AOA. For ease of reference, the key land management practices bearing upon aviation safety are summarized and highlighted below:

RECOMMENDATIONS:

1. Adhere to the turf, landscaping, and habitat management practices described in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual. Do not change these practices specifically to encourage the presence of, or to attract hazardous wildlife species even if the species are state-listed or of special concern.

    a. Do not deliberately preserve or develop on-airport wildlife habitats such as wetlands, forest, brush, or native grasslands having characteristics that attract

[1] Those species listed by states as threatened, endangered, or species of special concern vary from state to state. For information on state listed species, contact the appropriate state wildlife management Agency.

hazardous wildlife (See the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS Manual.)

b. Manage the airport's AOA vegetation as recommended in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual.

2. Adhere to the wildlife harassment and repellant techniques described in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual to prevent hazardous wildlife species from becoming established and complicating the ability to adhere to prescribed habitat management practices.

3. Do not allow hazardous state-listed threatened and endangered species or species of special concern to remain on the airport if it requires managing the airport environment contrary to FAA recommendations.

4. Reevaluate existing and evaluate future agreements with federal, state, or local wildlife agencies where the terms of the agreements are or may be contrary to federal obligations concerning hazardous wildlife on or near public-use airports and aviation safety.

5. Whenever practicable, wetland mitigation for state-listed threatened and endangered species or species of special concern should be sited off-airport (see AC 150/5200-33A, §2-4.c (1)).

OSB — 11/21/2006

Ben Castellano, Manager
Airport Safety & Operations Division — Date

DISTRIBUTION

CERTALERT DISTRIBUTION LIST

APPENDIX 1

Port of Olympia/
Olympia Regional Airport

Critical Area (Priority Habitat & Species) Environmental Inventory

ATTACHMENT SEVEN

FAA Wildlife Strike Database Report

for Olympia Regional Airport

Federal Aviation Administration

Airport Technology R&D Branch
Airport Wildlife Hazard Mitigation

Search the FAA Wildlife Strike Database

To search the database:

1. Click the drop-down arrow below State, Airport, or Airline, and then click an option in that list.
2. To narrow the list of results to a particular aircraft, engine type, wildlife species, or damage level, click the drop-down arrow below Aircraft, Engine Type, Species, or Damage, and then click an option in the list.
3. To sort the list of results by a particular column of data, click Sort in the 3rd row of that column. (The first click sorts in ascending order; a second click sorts in descending order.)

Note: This table includes only 8 out of a total of 94 fields of data. To view all 94 fields for your list of results, click the Export to Excel button below the table. (You can also download the complete FAA Wildlife Strike Database.)

Would you like to view strike reports by State, Airport, or Airline?

State - Make a Selection -

*** OR ***

Airport KOLM | OLYMPIA ARPT

*** OR ***

Airline - Make a Selection -

Results: 7

Records to display per page: 10

Date	State	Airport	Airline	Aircraft	Engine Type	Species	Damage
				All	All	All	All
Sort	Sort	Sort	Sort	Sort	Sort	Sort	Sort
10/2/1997	WA	OLYMPIA ARPT	UNKNOWN	BA-31 JETSTR	C	Unknown bird - medium	
10/2/1997	WA	OLYMPIA ARPT	BUSINESS	BA-31 JETSTR	C	Unknown bird - medium	N
1/29/1999	WA	OLYMPIA ARPT	BUSINESS	HAWKER 800	D	Sandpipers	S
2/5/1999	WA	OLYMPIA ARPT	UNKNOWN	UNKNOWN		Dunlin	
7/2/2003	WA	OLYMPIA ARPT	BUSINESS	BE-76 DUCHESS	A	Unknown bird - small	N
6/15/2004	WA	OLYMPIA ARPT	GOVERNMENT	C-182 SKYLAN	A	Hawks	N
5/22/2010	WA	OLYMPIA ARPT	BUSINESS	BE-35	A	Hawks	M

Export to Excel

Key

Engine Type	
A	Reciprocating
B	Turbojet
C	Turboprop
D	Turbofan
E	None (glider)

Damage (Civil)	
N	None
M	Minor
M?	Uncertain
S	Substantial
D	Destroyed

Damage (Military)	
Class A	Over $1,000,000
Class B	$200,000 - $1,000,000
Class C	$20,000 - Less than $200,000
Class N / Class E	No damage or damage less than $20,000

F	Turboshaft (helicopter)
Y	Other

Need a Custom Search?

You can optionally download the complete database in Microsoft Access format and write your own queries.

FAA Wildlife Strike database - MS Access format - Version 2010.7-P (115,008 Strike Reports from 1/1/1990 through 7/31/2010) - *Updated 10/28/2010 (18.4 Mb)*

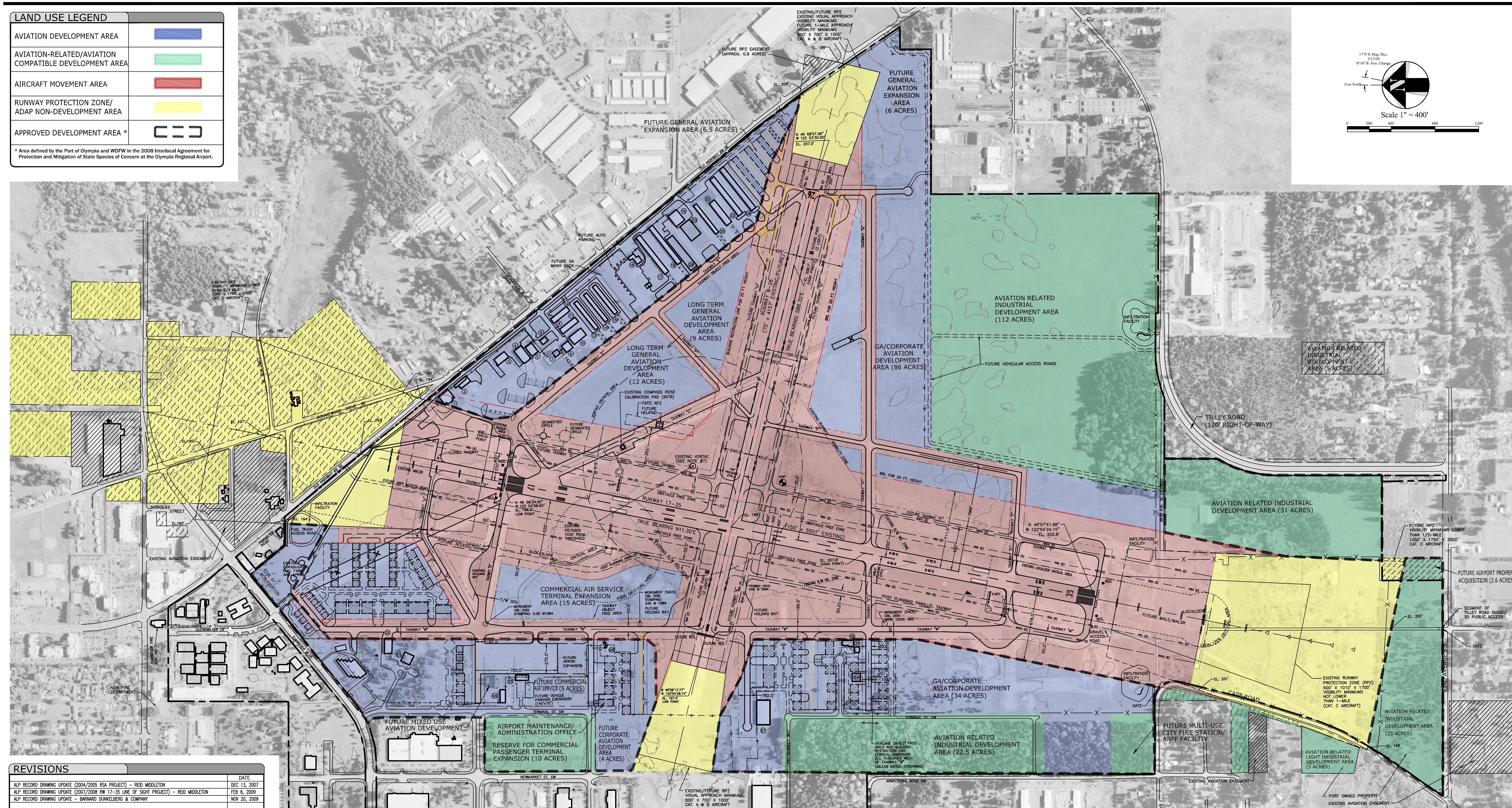
Have a suggestion?
Please submit your suggestions to the project lead: Ryan King

Last Update: 02/18/10

APPENDIX 2

Port of Olympia/
Olympia Regional Airport

Airport Land Use Plan



REVISIONS

	DATE
ALP RECORD DRAWING UPDATE (2004/2005 RSA PROJECT) – REID MIDDLETON	DEC 13, 2007
ALP RECORD DRAWING UPDATE (2007/2008 RW 17-35 LINE OF SIGHT PROJECT) – REID MIDDLETON	FEB 6, 2009
ALP RECORD DRAWING UPDATE – BARNARD DUNKELBERG & COMPANY	NOV 20, 2009

NON-STANDARD CONDITIONS

	ARC		STANDARD		NON-STANDARD		REMARKS
	EXISTING	*FUTURE*	EXISTING	*FUTURE*	EXISTING	*FUTURE*	

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BUILDING LEGEND

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2	GLACIER TERMINAL/MAINTENANCE HANGAR	19	PEARSON, FBO MAINTENANCE HANGAR
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4	MUSEUM HANGAR	21	T-HANGAR "G"
5	MAINTENANCE HANGAR	22	PENINSULA GROUP, INC, HANGAR
6	AIRPORT ADMINISTRATION OFFICE	23	PENINSULA GROUP, INC, OFFICE
7	GLACIER AVIATION, FBO	24	PEARSON MAINTENANCE HANGAR/OFFICE
8	FBO HANGAR	25	AIRPORT TERMINAL BUILDING
9	OLYMPIA AVIONICS	26	FAA AIR TRAFFIC CONTROL TOWER
10	AIRBORNE PROPERTIES HANGAR	27	SOLOY CORPORATION
11	OPEN HANGAR, PLANE PORT	28	T-HANGAR "I"
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15	T-HANGAR "C"	32	T-HANGAR "H"
16	JORGENSEN AIR SERVICE, FBO	33	PRIME DEVELOPMENT HANGAR "N"
17	EXECUTIVE HANGAR "D"	34	HANGAR "O" (CRAIG DEVELOPMENT)

AIRPORT DATA

	EXISTING	*FUTURE*
AIRPORT ELEVATION (AMSL)	208.7'	*208.7'*
AIRPORT REFERENCE POINT (ARP)	LAT. N 46°58'09.86" LON. W122°54'09.16"	LAT. N 46°58'09.86" LON. W122°54'09.16"
NPIAS CATEGORY	GA	*GA*
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	77.2°F	*77.2°F*
TAXIWAY LIGHTING	MITL	*MITL*
TAXIWAY MARKING	CENTERLINE	*CENTERLINE*
AIRPORT PROPERTY (APPROXIMATE ACRES)	1572	*1581*
UNICOM (MHz)	122.95	*122.95*
CONTROL TOWER (MHz)	124.4	*124.4*
MAGNETIC VARIATION (DATE)	17°0' E (5/2009)	
AIRPORT REFERENCE CODE	C–II	C–II
AIRPORT & TERMINAL NAVAIDS	VOR, DME	VOR,DME,GPS,NDB

LAYOUT PLAN LEGEND

	EXISTING	*FUTURE*
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	X
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED		
PAVED ROADS		
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	*BRL*
RUNWAY SAFETY AREA (RSA)	RSA (E)	RSA (F)
RUNWAY OBJECT FREE AREA (ROFA)	ROFA (E)	ROFA (F)
FUEL STORAGE AREA	F	F
AIRPORT BEACON	★	☆
LIGHTED WIND CONE & SEGMENTED CIRCLE		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
APPROACH LIGHTS		
EXISTING AVIGATION EASEMENT		
EXISTING PORT OF OLYMPIA PROPERTY		
FUTURE AIRPORT PROPERTY ACQUISITION		

MASTER PLAN UPDATE

Port of Olympia/ Olympia Regional Airport

Barnard Dunkelberg & Company
A Mead & Hunt Company
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

FIGURE 1 Airport Land Use Plan

APPENDIX 3

Port of Olympia/
Olympia Regional Airport

Critical Area Habitat One (Mazama Pocket Gopher & Oregon Vesper Sparrow) with Existing Airport Land Use

Critical Area Habitat Two (Streaked Horn Lark) with Existing Airport Land Use

Critical Area Habitat Three (Butterflies & Prairie) with Existing Airport Land Use

Figure 1
Critical Area Habitat One (Mazama Pocket Gopher & Oregon Vesper Sparrow) with Existing Airport Land Use

- To be included pending a final determination on the proposed “Threatened” Federal status of the Mazama Pocket Gopher and associated designation of critical habitat.

Figure 2
Critical Area Habitat Two (Streaked Horn Lark) with Existing Airport Land Use

- To be included pending a final determination on the proposed “Threatened” Federal status of the Streaked Horn Lark and associated designation of critical habitat.

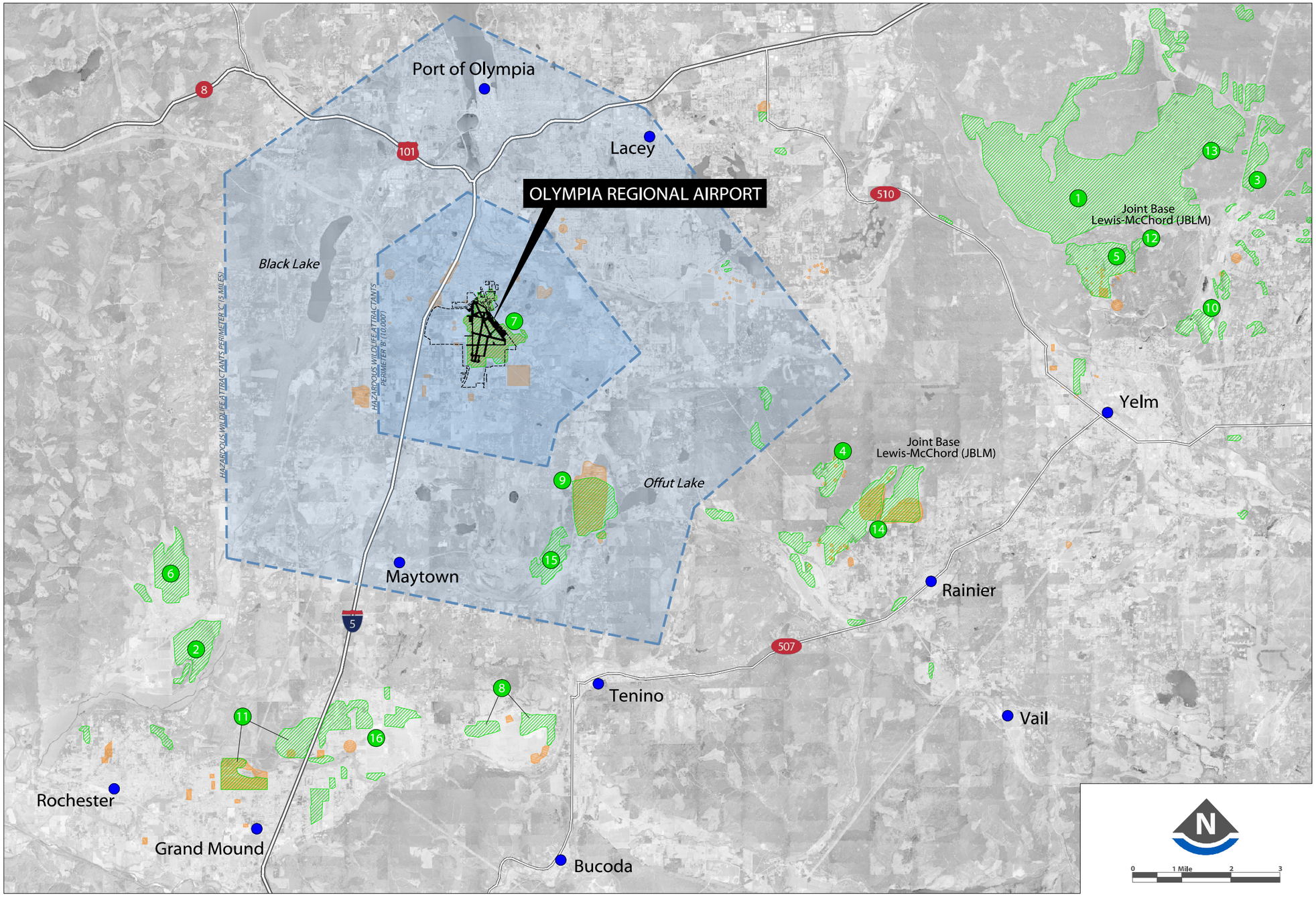
Figure 3
Critical Area Habitat Three (Butterflies & Prairie) with Existing Airport Land Use

- To be included pending a final determination on the proposed “Endangered” Federal status of the Taylor’s Checkerspot and associated designation of critical habitat.

APPENDIX 4

Port of Olympia/
Olympia Regional Airport

Olympia Regional Airport Potential Off-Site Mitigation Area Vicinity Map



LEGEND

- Gopher Locations (1990 - Present)
- Prairie/Grasslands (Chappel et al. 2008)
- Hazardous Wildlife Attractants Perimeter
- Cities
- Airport Property

1. 91st Division Prairie
2. Black River Mima Glacial Heritage
3. Chamber's Prairie
4. Johnson Prairie
5. Marion Prairie
6. Mima Mounds NAP
7. Olympia Airport
8. Rock Prairie
9. Rocky Prairie NAP
10. Roy Prairie
11. Scatter Creek Wildlife Area
12. South Impact Area
13. TA6
14. Weir Prairie
15. West Rocky Prairie
16. Mound Prairie

Sources:
1. "Review of the Proposed Federal Listing of Mazama Pocket as a Threatened Species in Thurston County, Washington" by Krippner Consulting, LLC, Seattle, WA. September 2011.
2. Washington Wildlife and Recreation Coalition Mapping, Potential and Actual Sites for Conservation of Prairie and Oak Woodland Ecosystems in the South Puget Lowlands of Washington. April 9, 2004.
3. Base map from Google Earth, 2012.

N

0 1 Mile 2 3

FIGURE 1
Olympia Regional Airport Potential Off-Site Mitigation Area Vicinity Map

MASTER PLAN UPDATE
Port of Olympia/
Olympia Regional Airport

APPENDIX 5

Port of Olympia/
Olympia Regional Airport

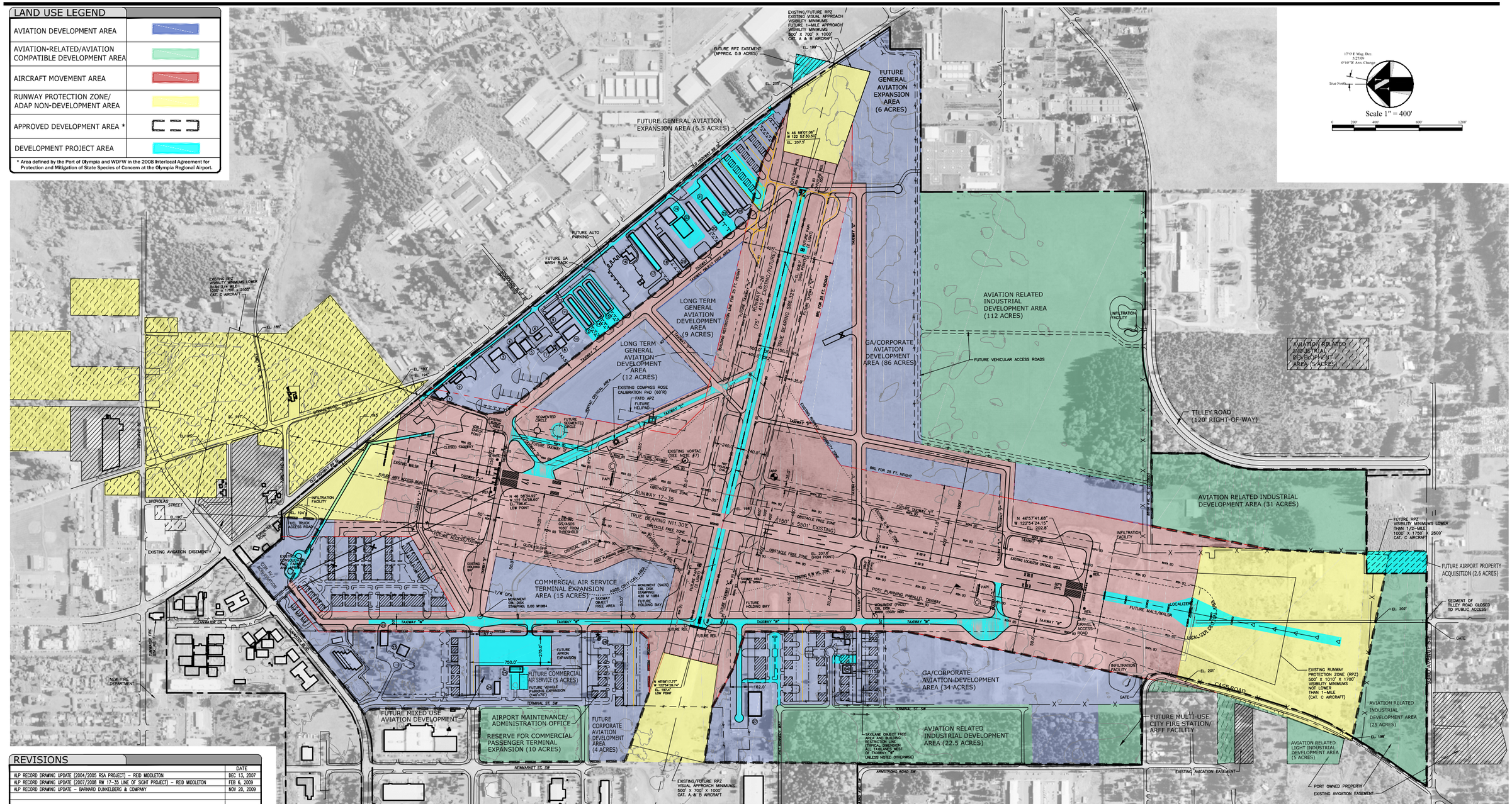
Airport Land Use Plan with 5-year Development Projects

Airport Land Use Plan with 20-year Development Projects

LAND USE LEGEND

AVIATION DEVELOPMENT AREA	
AVIATION-RELATED/AVIATION COMPATIBLE DEVELOPMENT AREA	
AIRCRAFT MOVEMENT AREA	
RUNWAY PROTECTION ZONE/ ADAP NON-DEVELOPMENT AREA	
APPROVED DEVELOPMENT AREA *	
DEVELOPMENT PROJECT AREA	

* Area defined by the Port of Olympia and WDFW in the 2008 Interlocal Agreement for Protection and Mitigation of State Species of Concern at the Olympia Regional Airport.



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NON-STANDARD CONDITIONS

	ARC		STANDARD		NON-STANDARD		REMARKS
	EXISTING	*FUTURE*	EXISTING	*FUTURE*	EXISTING	*FUTURE*	

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AIRPORT DATA

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NPIAS CATEGORY	GA	*GA*
MEAN MAX. TEMPERATURE (HOTTEST MONTH)	77.2°F	*77.2°F*
TAXIWAY LIGHTING	MITL	*MITL*
TAXIWAY MARKING	CENTERLINE	*CENTERLINE*
AIRPORT PROPERTY (APPROXIMATE ACRES)	1572	*1581*
UNICOM (MHz)	122.95	*122.95*
CONTROL TOWER (MHz)	124.4	*124.4*
MAGNETIC VARIATION (DATE)	17°0' E (5/2009)	
AIRPORT REFERENCE CODE	C-II	C-II
AIRPORT & TERMINAL NAVAIDS	VOR, DME	VOR,DME,GPS,NDB

LAYOUT PLAN LEGEND

	EXISTING	*FUTURE*
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	*X*
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED		
PAVED ROADS		
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	*BRL*
RUNWAY SAFETY AREA (RSA)	RSA (E)	*RSA (F)*
RUNWAY OBJECT FREE AREA (ROFA)	ROFA (E)	*ROFA (F)*
FUEL STORAGE AREA	(F)	*(F)*
AIRPORT BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
APPROACH LIGHTS	**** ****	**** ****
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EXISTING PORT OF OLYMPIA PROPERTY		
FUTURE AIRPORT PROPERTY ACQUISITION		

MASTER PLAN UPDATE

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FIGURE 1 Airport Land Use Plan with 5-year Development Projects

LAND USE LEGEND

AVIATION DEVELOPMENT AREA	
AVIATION-RELATED/AVIATION COMPATIBLE DEVELOPMENT AREA	
AIRCRAFT MOVEMENT AREA	
RUNWAY PROTECTION ZONE/ ADAP NON-DEVELOPMENT AREA	
APPROVED DEVELOPMENT AREA *	
DEVELOPMENT PROJECT AREA	

* Area defined by the Port of Olympia and WDFW in the 2008 Interlocal Agreement for Protection and Mitigation of State Species of Concern at the Olympia Regional Airport.

17°0' E Mag. Dec.
5/23/06
0°16' W Ann. Change

True North

Scale 1" = 400'

0 200' 400' 800' 1200'

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LAYOUT PLAN LEGEND

	EXISTING	*FUTURE*
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	*X*
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
AIRFIELD PAVEMENT TO BE REMOVED		
PAVED ROADS		
RUNWAY PROTECTION ZONE (RPZ)		
BUILDING RESTRICTION LINE (BRL)	BRL	*BRL*
RUNWAY SAFETY AREA (RSA)	RSA (E)	*RSA (F)*
RUNWAY OBJECT FREE AREA (ROFA)	ROFA (E)	*ROFA (F)*
FUEL STORAGE AREA	(F)	*(F)*
AIRPORT BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY END IDENTIFIER LIGHTS (REIL)		
APPROACH LIGHTS	**** ****	**** ****
EXISTING AVIGATION EASEMENT		
EXISTING PORT OF OLYMPIA PROPERTY		
FUTURE AIRPORT PROPERTY ACQUISITION		

MASTER PLAN UPDATE

Port of Olympia/ Olympia Regional Airport

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FIGURE 2 Airport Land Use Plan with 20-year Development Projects

Port of Olympia/
Olympia Regional Airport

Mead
&Hunt