Final Multiple Species General Conservation Plan

for

Douglas County, Washington

Prepared by:

Foster Creek Conservation District
P.O. Box 428
203 South Rainier
Waterville, Washington 98858

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Foster Creek Conservation District (FCCD) began the process of producing a Multiple Species General Conservation Plan (MSGCP) in 1999. Over the course of several years, multiple individuals produced a rough draft. Contributors include the following:

Carmen Andonaegui, Dale Bambrick, Kathleen Bartu ,Dennis Beich, Mark Bereither, Brent Billingsley, Bob Brammer, Tom Brannon, Pam Camp, Norman Cavadini, Bob Clubb, Harold Crose, Tim Cullinan, Grant Daniel, Sharon Davis, Tim Dring, Britt Dudek, Michelle Eames, Lee Faulkner, Jim Fisher, Ron Fox, Kevin Guinn, Sonia Hall, Neal Hedges, Jim Hemmer, Milt Johnston, Glen Klock, Bryce Krueger, Michelle Mazzola, Steve McGonigal, Jim O'Brien, Bethany Payne, Chuck Perry, Michel Rudd, Mike Schroeder, Wade Troutman, Randy Uhrich, Bill Vogel, Chuck Warner, Nancy Warner, Chris Warren, Roger Wesselman

In early 2013, the FCCD Board initiated steps to complete the MSGCP. The final document was prepared under the supervision of the Foster Creek Conservation District, Jon Merz, District Manager, Waterville, Washington 98858.

Rewritten and updated by:

Bob Tuck
Eco-Northwest
Selah, Washington 98942

Edited and formatted by:
Christy Peterson
Cascade Creative Services
Vancouver, Washington 98682

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Douglas County Multiple Species General Conservation Plan

Executive Summary

The Foster Creek Conservation District (FCCD), in cooperation with the South Douglas Conservation District and involving agricultural landowners and other stakeholders, began developing a Habitat Conservation Plan (HCP) for agricultural activities in Douglas County in 1999. This effort resulted in the Multiple Species General Conservation Plan for Douglas County (MSGCP).). A draft EA was released along with the draft MSGCP on November 14, 2014. The public comment period was open for 60 days, and the USFWS received comments from the Washington Department of Fish and Wildlife, The Nature Conservancy, Washington Cattlemen's Association, and two individuals. Where appropriate, comments were addressed in this Final MGCP.

Under Section 10 of the Endangered Species Act, private companies or individuals whose normal operation could result in the "take" of a federally-listed species may enter into an agreement called a HCP, which is used as part of an application package to receive an Incidental Take Permit or Section 10 permit from the U.S. Fish and Wildlife Service (USFWS). A General Conservation Plan (GCP) is a type of programmatic Habitat Conservation Plan under which multiple Section 10 permits can be issued (USFWS 2007). If approved, the MSGCP will facilitate review of future Incidental Take Permit applications. Section 10 permits allow the "incidental take" of threatened or endangered species resulting from otherwise lawful activities occurring on non-federal agricultural lands within Douglas County. Applicants or Permittees can use this process to gain long-term assurances for their agriculture operations, while committing to certain measures to help conserve threatened, endangered, or rare species.

The MSGCP will cover the Columbia Basin pygmy rabbit (an endangered species), the Greater sage grouse and Washington ground squirrel (both candidate species), and the Columbian sharp-tailed grouse (a species of concern). These species generally use shrub-steppe, grassland, and/or riparian habitats in Douglas County. The MSGCP describes a process for Applicants/Permittees (private agriculture landowners or lessees) to voluntarily develop site-specific Farm Plans/Site Plans with Best Management Practices (BMPs) that will result in improved habitat for Covered Species.

Some habitat used by Covered Species in Douglas County occurs in small parcels or fragments within large agriculture operations, some is larger blocks of grazing land or open land, and some is provided through implementation of the U.S. Department of Agriculture Conservation Reserve Program (CRP), including the State Acres for Wildlife Enhancement program (SAFE). Additional large blocks of habitat are provided on Washington Department of Fish and Wildlife, The Nature Conservancy, and Bureau of Land Management in the form of Habitat Conservation Areas (HCA) in the County. The MSGCP will use monitoring to ensure that levels of

CRP/SAFE lands and levels of HCAs in the County remain at similar levels to the current condition. If they decrease by 10 percent, there are measures included to evaluate the decrease and to determine whether the MSGCP will continue to work as intended.

If the MSGCP meets issuance criteria, individual Applicants will work with the FCCD to develop Farm Plans specific to their agricultural operations. These Farm Plans will be completed by the Applicants, their appointees, or the FCCD. FCCD will review Farm Plans to ensure consistency with the MSGCP. Farm Plans will provide a description of on-going and planned agricultural activities for included lands and will be very similar to a Natural Resource Conservation Service (NRCS) Conservation Plan. During the period between the draft and final MSGCP, it became apparent that the term "Farm Plan" was causing confusion, because this term is typically used by the NRCS and has a very specific meaning. Therefore, we have clarified the language to include both the initial step of a "Farm Plan" including NRCS Conservation Practices, and the second step with the part of the plan including the additional measures for certain land uses and specific species in certain situations based on habitats, species presence, or location now called a "GCP Site Plan". After Farm Plans and GCP Site Plans are developed by applicants and permit applications are submitted, the USFWS will notice the receipt of the application in the Federal Register, request public comments, and review Farm Plans/GCP Site Plans and applications for consistency with the MSGCP, the NEPA analysis, and related decision documents. If applications are consistent with expectations of the documents listed above, the USFWS will issue Section 10 permits.

The MSGCP includes an Adaptive Management and Monitoring Plan (AMMP), which addresses implementation and effectiveness monitoring, as well as a process to revise or modify any BMPs to achieve better results. A multi-species Habitat Suitability Index (HSI) spatial model was developed to quantify BMP effects to Covered Species and habitat. The HSI model allows a landscape (countywide) analysis of habitats over time.

Implementation of Farm Plan/GCP Site Plans, together with the ongoing maintenance of CRP/SAFE acres and HCAs in Douglas County, should result in improved habitats for Covered Species over the 50-year term of the MSGCP.

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Acronyms Used in MSGCP

AMMP	Adaptive Management and Monitoring Plan
B.P.	Before Present
BCC	Bird of Conservation Concern
BCR	Bird Conservation Region
BCR 9	Great Basin Bird Conservation Region 9
BLM	Bureau of Land Management
BMP	Best Management Practice
BOR	U.S. Bureau of Reclamation
CAA	Clean Air Act of 1963
CFR	Code of Federal Regulations
CMU	Conservation Management Units
CP	Conservation Practice
CPGL	Conservation of Private Grazing Lands
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSP	Conservation Security Program
County	Douglas County, Washington
CWA	Clean Water Act
DCWPA	Douglas County Watershed Planning Association
DPS	Distinct Population Segment
Draft EA	Draft Environmental Assessment
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)
ESM	Ecological Services Manual
FCCD	Foster Creek Conservation District
FIFRA	Federal Insecticide Fungicide and Rodenticide Act
FLPMA	Federal land Policy Management Act
FOTG	Field Office Technical Guide

FPP	Farmland Protection Program
FQPA	Food Quality Protection Act
GCP	General Conservation Plan (Programmatic)
GIS	Geographical Information System
GRP	Grasslands Reserve Program
HB	(Washington State) House Bill
HCA	Habitat Conservation Area
HCP	Habitat Conservation Plan
HPA	Hydraulic Project Approval
HSI	Habitat Suitability Index (Indices)
IM	Implementation and Monitoring
ITP	Incidental Take Permit
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
MSGCP	Douglas County Multiple Species General Conservation Plan
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organization
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOI	Notice Of Intent
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWPCC	Northwest Power Planning Council
Permittees	private agriculture landowners or lessees
PLC	Private Landowners Committee
PNC	Potential Natural Community
RCW	Revised Code of Washington (State)
RMP	Resource Management Plan
RMS	Resource Management System
SAFE	State Acres for Wildlife Enhancement
SEPA	State Environmental Protection Act

Services	U.S. Fish and Wildlife Service and National Marine Fisheries Service
SFWA	Sagebrush Flat Wildlife Area
SHA	Safe Harbor Agreement
TAC	Technical Advisory Committee
TNC	The Nature Conservancy
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDFW	Washington Department of Fish & Wildlife
WDNR	Washington Department of Natural Resources
WHIP	Wildlife Habitat Incentives Program
WRIA	Water Resource Inventory Area
WRP	Wetlands Reserve Program
WSCC	Washington State Conservation Commission

Douglas County Multiple Species General Conservation Plan

Chapter 1: Purpose and Need

Chapter Overview

Chapter 1 outlines the steps taken to develop the Multiple Species General Conservation Plan (MSGCP) for Douglas County, Washington (County) and the purpose and need for this plan. The chapter includes a brief overview of the species and activities covered by the MSGCP and available habitat in the Plan Area (Figure 1-1). Chapter 1 also identifies and describes the Federal, State, and County laws and regulations upon which this MSGCP is based.

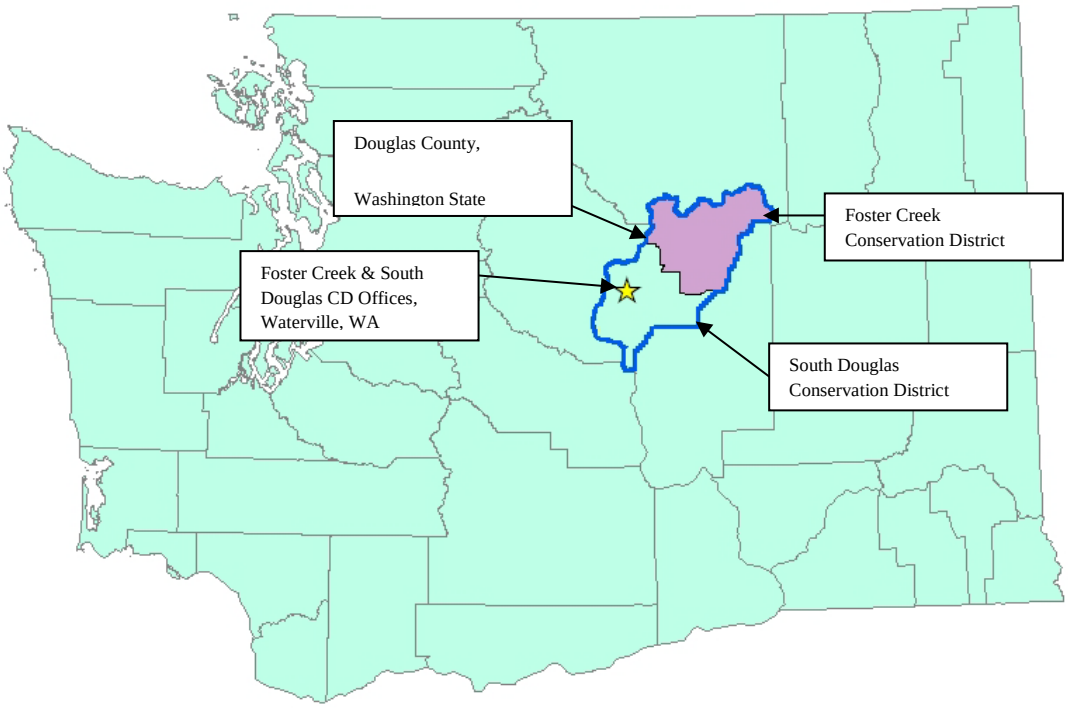

Figure 1-1: Douglas County, WA (Plan Area) shown on State of Washington Map

Note: This MSGCP is applicable to all private agricultural lands in Douglas County. Although there are two Conservation Districts in the County, Foster Creek Conservation District (FCCD) agrees to assist with implementation of the MSGCP in South Douglas County Conservation District (SDCCD) as clarified in a Memorandum of Understanding (MOU) (Appendix A). The FCCD also has a MOU with the U.S. Fish and Wildlife Service (USFWS) clarifying their commitment to implement and monitor the MSGCP (Appendix I).

Introduction and History

In the fall of 1999, the FCCD began to investigate the level of interest among the County's agricultural producers in participating in the development of a Habitat Conservation Plan (HCP). The HCP would be used in applying for a Section 10(a)(1)(B) (Section 10) permit under the 1973 ESA, as amended. A Section 10 permit would allow the incidental take of threatened or endangered species resulting from otherwise lawful activities on non-Federal agricultural lands within Douglas County, providing agricultural producers assurances under the ESA for agricultural activities as approved under the permit. Obtaining a Section 10 permit requires the submission of a habitat conservation plan (HCP) to the USFWS and completion of a National Environmental Policy Act (NEPA) analysis of the USFWS's proposed issuance of the permit.

A Notice of Intent (NOI) to prepare an HCP and a Draft Environmental Impact Statement was published in the Federal Register on May 30, 2000 (65 FR 34493). The NOI included a request to submit comments to USFWS by July 14, 2000. The NOI also included information regarding two public Scoping Workshops scheduled for June 29, 2000, in Waterville, Washington. A USFWS news release dated June 22, 2000, was distributed to local news media and notification sent directly to about 950 persons and agencies that had shown previous interest in FCCD activities. Four individuals attended the workshops (two landowners, a Chelan County representative, and a representative of the Confederated Tribes of the Colville Reservation). A follow-up scoping workshop was held on January 25, 2005, to update the project scope. This second scoping workshop had 85 attendees. A summary of issues and concerns recorded at these workshops are on file at the FCCD.

After discussion, the USFWS and the FCCD decided that a General Conservation Plan (GCP) was the best fit for the applicant scenario in Douglas County. A GCP is a type of programmatic HCP under which multiple Section 10 permits can be issued (USFWS 2007). If approved, the MSGCP would facilitate efficient review of future incidental take applications. The USFWS determined that an Environmental Assessment (EA) is an appropriate document for the NEPA analysis to determine if there will be significant impacts to the environment. Since 2000, the participating team has worked with government agencies and the public in order to prepare this MSGCP. It is designed to benefit Covered Species for up to a 50-year time period; issued permits will not extend coverage beyond 50 years from the publication date of the final MSGCP. The FCCD prepared this MSGCP with the intent of reducing the likelihood of listing of additional Douglas County species as threatened or endangered under the ESA. Possible incidental take of some ESA species due to land-use practices can be anticipated as this MSGCP is implemented. Thus, the MSGCP has been prepared in accordance with Section 10 of the ESA as well as 50 CFR 17.22(b) and 17.32(b). This MSGCP identifies actions that will be implemented to maintain the natural habitats for four Covered Species (Table 1-1) in the Plan Area. (The Plan Area is defined as the total area of Douglas County, Washington. See Figure 1-1).

A draft EA was released along with the draft MSGCP on November 14, 2014. The public comment period was open for 60 days, and the USFWS received comments from the Washington Department of Fish and Wildlife, The Nature Conservancy, Washington Cattlemen's Association, and two individuals. Where appropriate, comments were addressed in this Final MGCP.

MSGCP Purpose and Need

Several wildlife species that utilize habitat in Douglas County are listed pursuant to the Federal Endangered Species Act of 1973, as amended (16 U.S.C 1531 et seq.) (ESA), are candidates for listing, and/or are on the State of Washington's Threatened and Endangered Species list. These species include the Columbia Basin pygmy rabbit, the Washington ground squirrel, the Columbian sharp-tailed grouse, and the greater sage-grouse. This MSGCP will focus on these four species.

Table 1-1: Covered Species in the Douglas County MSGCP (Species Status as of 06/01/13)

Species	Type	Scientific Name	Agency	Current Status
Columbia Basin Pygmy Rabbit	mammal	*Brachylagus idahoensis*	USFWS/ WDFW	Federal Endangered State Endangered
Washington Ground Squirrel	mammal	*Urocitellus washingtoni*	USFWS/ WDFW	Federal Candidate State Species of Concern
Columbian Sharp-tailed Grouse	bird	*Tympanuchus phasianellus columbianus*	USFWS/ WDFW	Federal Species of Concern State Threatened
Greater Sage-grouse	bird	*Centrocercus urophasianus*	USFWS/ WDFW	Federal Candidate State Threatened

Within Douglas County, Washington, about 75 percent of the land area has been converted from natural habitat to agricultural production over the past century. There has been a decline in the populations of numerous native wildlife species during this period, apparently as a result of this land-use conversion (Wooten n.d.; Azerrad et al. 2011). The private agricultural landowners in Douglas County desire to stabilize or reverse the declining population trends of ESA Species as well as other key wildlife species

The purpose of this MSGCP is to balance wildlife protection with the economic stability of landowners in the Plan Area (Figure 1-1) by:

1. Defining and implementing actions by landowners in an efficient and timely manner to reach conditions that provide for the conservation of Covered Species in the Plan Area.
2. Complying with endangered species-related laws and regulations.

3. Reducing uncertainty for Douglas County agricultural operators as they plan future land-use activities.
4. Providing for the conservation of Covered Species and the mitigation, minimization, and compensatory measures required in connection with the incidental take of Covered Species in the course of otherwise lawful and permitted activities within the Plan Area.

This MSGCP will describe:

1. The impact(s) that will likely result from the proposed incidental take of Covered Species.
2. The steps the applicants, with assistance from FCCD, will take to monitor, minimize, and mitigate possible impacts to Covered Species.
3. MSGCP alternatives to the incidental take of Covered Species and the reasons why these alternatives were not pursued.
4. Procedures that will be used to deal with unforeseen circumstances.
5. An implementation plan, including level and sources of funding available for the MSGCP.
6. Other requirements requested by the USFWS as necessary or appropriate.

MSGCP Plan Area and Habitat Description

The Plan Area includes all of Douglas County (Figure 1-1). The requested coverage for incidental take, however, is limited to non-Federal agricultural lands within the County boundary. Agricultural lands are defined as lands involved in the preparation of soil for crop production, the cultivation of crops, and the production and culture of animal products and fiber for human consumption, feed, and/or sale as articles of trade or commerce. The withdrawal of irrigation water from the Columbia River or use of water piped across the Columbia from the Wenatchee River is not a Covered Activity under this MSGCP, since the focus of the GCP is terrestrial shrub-steppe species rather than listed fish. Therefore, most orchards in Douglas County will not be covered under the MSGCP.

Douglas County's predominate wildlife habitat from the end of the most recent glacial period through the early 1900s was the shrub-steppe plant community. These shrub-steppe plant communities were mostly located in areas of deep soil that have since been largely converted to agricultural use. Most of the original shrub-steppe habitat that remains is found in areas of thin soils known as "lithosols." These remaining communities, for the most part, show the impacts of decades-long grazing, introduced plant species, altered fire regimes, and other anthropogenic disturbances. Together, these impacts have altered the composition of the surviving native shrub-steppe habitat (Quigley and Arbelbide 1997; Knick 1999) making it difficult to find vegetative communities in Douglas County that truly reflect pre-development conditions.

Covered Species

The shrub-steppe and riparian/wetland ecosystems in Douglas County support numerous species of mammals, birds, amphibians, and reptiles (Appendix C, Table C-1). Riparian habitats support several bird species, including some shrub-steppe obligate species (e.g., seasonal use by Columbian sharp-tailed grouse). Details about the four Covered Species, including status, general description, occurrence, and habitat requirements, are introduced in Chapter 1 and discussed in detail in Appendix D.

Covered Species under this MSGCP, along with their Federal and State status, are shown in Table 1-1. To assist in analysis and implementation, the four Covered Species are broken down into two groups as shown in Table 1-2.

Table 1-2: Covered Species Groups

Group	Covered Species
Burrowing Mammals	Columbia Basin Pygmy Rabbit Washington Ground Squirrel
Shrub-steppe Grouse	Columbian Sharp-tailed Grouse Greater Sage-Grouse

Burrowing Mammals Group

Soil and vegetation disturbance by land-use activities is one of the major impacts on habitat for the burrowing mammals. Underground dens are often destroyed or damaged by tillage and by motor vehicles driving over them. The goal of the MSGCP for the burrowing mammals group is to protect existing desired habitat on deep soils beneath big sagebrush through limits or mitigation of conversion activities, through grazing management, and through minimization of recreational motorized access, among other Best Management Practices (BMP) (Appendix E).

The Columbia Basin pygmy rabbit (*Brachylagus idahoensis)*, and the Washington ground squirrel (*Urocitellus washingtoni)* are most frequently found where soil depths are greater than 24 inches and where there are no impermeable layers within the soil profile.

Columbia Basin Pygmy Rabbit (Brachylagus idahoensis)

The pygmy rabbit is the smallest rabbit in North America and is one of only two rabbit species native to North America that dig their own burrows. The pygmy rabbit is dependent upon sagebrush, particularly big sagebrush (*Artemisia tridentata*), growing in dense stands or clumps where an understory of perennial bunch grasses and forbs is also present.

The pygmy rabbit was listed as “Threatened” by the State of Washington in 1990 and was reclassified as “Endangered” in 1993. Using an emergency provision of ESA, the USFWS listed

the Columbia Basin distinct population segment of the pygmy rabbit as "Endangered" in November 2001, and fully listed it as "Endangered" in March 2003 (Becker 2013).

In 1995, WDFW developed a recovery plan for the pygmy rabbit, *Washington State Recovery Plan for the Pygmy Rabbit*. Since the initial plan, several addendums have been developed, including *Washington Pygmy Rabbit Emergency Action Plan for Species Survival* (Hays 2001), *Washington Pygmy Rabbit 2003 Recovery Plan Update* (Hays 2003), and *2011 Columbia Basin Pygmy Rabbit Reintroduction and Genetic Management Plan* (Becker et al. 2011).

The USFWS developed its recovery plan, *Recovery Plan for the Columbia Basin Distinct Population Segment of the Pygmy Rabbit* (*Brachylagus idahoensis)*, in late 2012. Notice of this recovery plan was published in the Federal Register on 23 January 2013 (78 FR 4865-4866).

In 1997, six isolated populations of pygmy rabbits were known to exist in Douglas and northern Grant counties. Between 1997-2001, all of these populations became extirpated except for one located at Sagebrush Flat, Douglas County (Becker 2013). Because of this rapid population decline, 18 pygmy rabbits were captured and removed for a captive-breeding effort (Hays 2003). Subsequent field surveys for wild pygmy rabbits from 2004 through 2010 failed to detect any animals, indicating that the pygmy rabbit may have been extirpated from the wild in Washington (USFWS 2012).

The pygmy rabbit captive breeding program commenced in 2002 and eventually included three facilities located at Washington State University, Northwest Trek Wildlife Park, and the Oregon Zoo. Initial reproductive success was very poor due to lack of genetic diversity and disease (Becker 2013). In 2003, the decision was made to intercross captive Washington pygmy rabbits with pygmy rabbits captured in Idaho in order to increase genetic vigor and reduce incidence of disease. Interbreeding is now an integral part of recovery efforts for the Columbia Basin pygmy rabbit (USFWS 2012).

In March 2007, 20 captive-breed intercrossed pygmy rabbits were released directly into the wild at Sagebrush Flat Wildlife Area. This release was not successful and all 20 animals disappeared by the following spring (USFWS 2012).

Although interbreeding was successful in increasing genetic diversity and increasing the number of individuals in the captive breeding program, it did not produce enough animals to allow for the reintroduction of rabbits back into the wild (USFWS 2012; Becker 2013). Therefore, the captive breeding programs were discontinued at WSU and Northwest Trek Wildlife Park following the 2011 breeding season, and at the Oregon Zoo following the 2012 breeding season (USFWS 2012).

Between May 2011 and July 2012, all the rabbits in the captive breeding programs at the three facilities were moved to six and ten-acre enclosures at the Sagebrush Flat Wildlife Area (Becker 2013). Recovery shifted from a captive breeding-based approach to three primary actions: 1)

capturing wild pygmy rabbits in other states and translocating them to Washington, 2) breeding the wild-caught and captive-bred (those with Columbia Basin ancestry) pygmy rabbits under semi-wild conditions of the enclosures, and 3) releasing the interbred juveniles at the site (Becker 2013).

Since 2011, a total of 104 pygmy rabbits have been translocated from Oregon, Nevada, Utah, and Wyoming and placed in the large enclosures, where they joined captive-bred adults and kits. Reproduction among the wild-caught and captive-bred animals has been very successful in the enclosures, with over 200 kits born during the 2013 breeding season. Since 2011, over 300 pygmy rabbit kits have been released, which has resulted in the re-establishment of a small wild population in central Washington. (Becker 2013). Reintroduction efforts are expected to continue over the next several years.

Columbia Basin Pygmy Rabbit Safe Harbor Agreement

In October 2006, The USFWS and the WDFW signed a Safe Harbor Agreement (SHA) to provide legal protections for "incidental take" that may occur near the pygmy rabbit reintroduction areas. The MSGCP is consistent with the requirements of the SHA and will complement those efforts by providing Best Management Practices (BMPs) to maintain or enhance pygmy rabbit habitat. As of 30 June 2013, 17 landowners have signed up over 120,000 acres under the SHA (Warren, C., *in litt*. 2013). Their responsibilities include, but may not be limited to:

1. Provide USFWS, WDFW, or a mutually agreeable third party with access and opportunity to conduct surveys for pygmy rabbits.
2. Allow USFWS and WDFW to capture and remove pygmy rabbits from properties being considered for enrollment, as appropriate to help achieve recovery objectives.
3. Provide USFWS and WDFW access to enrolled properties for the term of associated Permits, through a mutually-agreeable notification process, to monitor any pygmy rabbits present.
4. Notify USFWS at least 30 days prior to undertaking any habitat-altering activity that could result in authorized incidental take of pygmy rabbits, and provide the USFWS and WDFW the opportunity to translocate any affected pygmy rabbits to suitable alternate site(s) prior to implementation of those activities.
5. Immediately notify USFWS upon finding any dead or accidentally killed pygmy rabbits on enrolled property or immediately contact an appropriate representative of USFWS or WDFW for assistance if identification of the specimen is uncertain.

In cases where the goal is to support recovery efforts directly, some landowners, such as The Nature Conservancy, have voluntarily agreed to undertake additional responsibilities.

Washington Ground Squirrel (Urocitellus washingtoni)

The Washington ground squirrel is a burrowing species that lives in sagebrush or grassland habitats in the Columbia River Basin of Washington and Oregon (Klein 2005). It is overall grey in color with light speckling on the back and buffy underparts. Total length ranges from about 7 inches to approximately 10 inches, while weight ranges from about 5 to 10 ounces (Eder 2002).

Washington ground squirrels spend less than half the year in an active period, normally between late winter and early summer. During this period, all feeding, reproduction, and social activities occur. The active period coincides with the availability of high quality forbs and grasses essential for reproduction and building fat reserves for the following hibernation period. By mid-summer, all Washington ground squirrels have entered hibernation, where they will stay until the following late-winter (Sato 2010).

Historically, this species occupied grassland and shrub-steppe habitat across much of the Columbia Plateau region of Eastern Washington but populations have declined drastically over the past 150 years. Records indicate that they once inhabited 10 counties, but are now absent from Spokane, Whitman, Garfield, and Columbia counties. Most colony sites in Washington are now located in Grant, Douglas, and Adams counties, with small numbers of sites present in Franklin, Lincoln, and Walla Walla counties (WDFW 2012).

In 2004, WDFW conducted field surveys of Washington ground squirrel sites at four locations in Douglas County: Duffy Creek, Foster Creek, Jameson Lake, and Sagebrush Flats Wildlife Area. A total of 44 active sites were recorded: Duffy Creek-21, Foster Creek-3, Jameson Lake-12, and Sagebrush Flats Wildlife Area-8. This compares with a total number of active sites recorded during field surveys in 2001-2003 at the same four locations of 48 (Finger et al. 2007).

The Washington ground squirrel was listed as a State Candidate species in 1997 and a Federal Candidate species in 1999 (WDFW 2012).

Shrub-steppe Grouse

Healthy populations of Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) and greater sage-grouse (*Centrocercus urophasianus)* require large expanses of relatively undisturbed shrub-steppe plant species, including big sagebrush (*Artemisia tridentata*), stiff sage (*Artemisia Rigida*), and three-tip sage (*Artemisia tripartite*), along with appropriate species of grass and forbs, including deer parsley (*Lomatium* spp.), clover (*Trifolium* spp.), and buckwheat (*Eriogonum* spp.). Desirable shrub-steppe habitat has emerged and is maturing on lands enrolled in the Conservation Reserve Program (CRP) in Douglas County, as well as non-CRP lands, (Hays et al. 1998; Schroeder and Vander Haegen 2006; Schroeder and Vander Haegen 2011) and will be provided on SAFE (State Acres for Wildlife Enhancement) acres. The goal of this MSGCP is to continue further development and protection of high quality shrub-steppe habitat, particularly among existing dryland and rangeland agricultural operations, thus supplementing the CRP.

Columbian Sharp-tailed Grouse (Tympanuchus phasianellus columbianus)

The Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) is a medium-sized prairie grouse that historically inhabited shrub-steppe, meadow steppe, mountain steppe, and riparian deciduous habitats in Western North America, mostly west of the Rocky Mountains, from northern New Mexico to Central British Columbia (Stinson and Schroeder 2012).

Sharp-tailed grouse derive their name from the two middle tail feathers that extend approximately 2 inches beyond the other tail feathers, creating the distinctive sharp tail. Coloration includes various hues of dark brown, black, buff, and white, resulting in an over-all cryptic appearance, appropriate for a ground-nesting bird. Adults are 16 to18.5 inches in length; males weight 1.5 to 2.0 pounds, while females weigh 1.3 to 1.7 pounds (Stinson and Schroeder 2012).

A pink to pale violet air sac on each side of the neck distinguishes males from female sharp-tailed grouse. These air sacs are inflated during courtship displays that occur on "leks" during the early spring. Both males and females also have yellow combs above the eyes, although they are less conspicuous in the female (Stinson and Schroeder 2012).

Historically, this species inhabited most of Eastern Washington, including the foothills of the Cascades, with the exception of the mountainous Northeast, Okanogan Highlands, and the Blue Mountains. While historic population estimates are difficult to develop, the population of sharp-tailed grouse in Washington may have exceeded 100,000 birds (Stinson and Schroeder 2012).

Sharp-tailed grouse populations were in serious decline soon after large-scale habitat conversion to agricultural production began in the late-1800s. This decline continued through the mid-20th century, by which time the estimated population had been reduced to 10,000 birds (Stinson and Schroeder 2012).

The sharp-tailed grouse population continued to decline, and by 1970 was reduced to fewer than 4,000 birds. By the mid-1990s, the population had been reduced to approximately 1,000. The lowest population estimate was reached in 2001, at 472 birds. Since then the population has increased slowly; the estimated population in 2011 was 902 birds. Less than 3 percent of the historic range in Washington is currently utilized (Stinson and Schroeder 2012).

The current sharp-tailed grouse population is restricted to seven isolated locations in Lincoln, Okanogan, and Douglas counties. In Douglas County, they are found in the northeast corner from Bridgeport to Grand Coulee, and in the northwest corner in the Dyer area (Stinson and Schroeder 2012).

The Columbian sharp-tailed grouse was listed as a State "Threatened" species in 1998. It is currently designated a Species of Concern by the USFWS (Stinson and Schroeder 2012). The WDFW released a recovery plan, *Columbian Sharp-tailed Grouse Recovery Plan*, in 2012.

In an effort to increase the population of Columbian sharp-tailed grouse in Washington, WDFW has translocated a total of 392 adult grouse from populations in Utah, British Columbia, Idaho and the Colville Indian Reservation. In 1998, 1999, and 2000, a total of 51 birds from Idaho and 12 from the Colville Indian Reservation were translocated to the Scotch Creek Wildlife Area in Okanogan County. This translocation effort appears to have been moderately successful, with the Scotch Creek population increasing from a low of an estimated five birds in 1998, prior to translocation efforts, to a high of approximately 120 birds in 2008. Population estimates in recent years have been approximately 60 birds (Schroeder et al. 2012).

From 2005 through 2011, WDFW translocated an additional 329 birds from British Columbia, Idaho, and Utah to three release sites in Douglas, Lincoln, and Okanogan counties. Although it is too early to in the augmentation process to determine the success of this effort, some increase in the sharp-tailed grouse population at the Douglas County and Lincoln County release areas has been documented (Schroeder et al. 2012).

Greater Sage-grouse (Centrocercus urophasianus)

The greater sage-grouse (*Centrocercus urophasianus)* is the largest species of grouse in North America. Males range from 26 to 30 inches in length and weigh 5.5 to 7 pounds. Females are smaller, measuring from 19 to 23 inches and weighing from 2.9 to 3.7 pounds. The upper parts are a combination of buff, black and brownish grey, with a black belly and long, pointed tail feathers. In addition, males have white breast and black throat (Stinson et al. 2004).

Males also have two large yellowish-green balloon-like gular sacs (balloon-like pouches located along the throat), which are inflated during courtship displays. Greater sage-grouse are noted for their elaborate courtship dance, which occur in the early spring in traditional areas called "leks" (Stinson et al. 2004).

Historically, greater sage-grouse inhabited suitable shrub-steppe and meadow steppe habitat in Eastern Washington. Their range extended from the Oregon border to the Canadian border and was bounded on the west by the foothills of the Cascade Mountains. On the south, the range ran along the Oregon border to the Blue Mountains, then north to the Spokane River, south of the Spokane River to its junction with the Columbia River, then up the Okanogan Valley into southern British Columbia (Stinson et al. 2004). Only about 8 percent of the historic range is currently occupied in Washington, albeit at greatly reduced population levels (Schroeder et al. 2011). Virtually all of Douglas County was included in the historic range of greater sage-grouse in Washington (Yocom 1956; Hays et al. 1998b; Schroeder et al. 2000; Stinson et al. 2004; Connelly et al. 2004).

Prior to settlement of Washington by Euro-Americans, sage grouse were abundant across shrub steppe habitat, but by the late 1800s, the species was in serious decline (Stinson et al. 2004). This decline continued across the 20th century; the estimated number of sage grouse in the early

1970s was less than 3,000 birds, located in three small remnant populations-Moses Coulee, Yakima Training Center, and Crab Creek. The Moses Coulee population was the largest of the three, with an estimated population of approximately 2,000 (Schroeder et al. 2011).

Unfortunately, sage grouse numbers have continued to decline over the past 40 years, although at a less-steep rate. The Moses Coulee population hit a 40-year low of approximately 400 in the mid-1980s, but has modestly recovered over the past 25 years (Schroeder et al. 2011). The 2011 estimated population of sage grouse in Washington was approximately 1,165 birds: Douglas County–926, Yakima Training Center–213, and Lincoln County–26 (Schroeder et al. 2011).

Greater sage grouse in Washington were listed as a State "Candidate" species in 1991; this classification was changed to State "Threatened" in 1998 (Stinson et al. 2004). The Columbia Basin distinct population segment (WA population) was designated as a "Candidate" species by the USFW in 2001 (Stinson et al. 2011; USFWS 2001).

The WDFW developed a recovery plan for the greater sage grouse, *Greater Sage Grouse Recovery Plan*, in 2004 (Stinson et al.). Extensive research and recovery efforts, such as translocating sage grouse to Lincoln County, are ongoing (Schroeder et al. 2011). Between the spring of 2008 and the spring of 2011, WDFW translocated a total of 144 greater sage-grouse from Oregon to Lincoln Swanson Lakes Wildlife Area in Lincoln County. It is yet to be determined if this effort will be successful in establishing a self-supporting population in this area (Schroeder et al. 2011)

In February 2013, the U.S. Fish and Wildlife Service issued a *Final Report: Greater Sage-Grouse (Centrocercus urophasianus) Conservation Objectives*. This report is designed to help States and other partners conserve the greater sage-grouse with a landscape level strategy. The report, prepared by state and Federal scientists and sage-grouse experts, identifies the conservation status of the sage-grouse, the nature of the threats facing the species, and objectives to ensure its long-term conservation.

The BLM has prepared a *National Sage-Grouse Habitat Conservation Strategy* (USBLM 2004) to serve as a national framework to address the conservation of greater sage-grouse habitat on BLM-managed lands.

Covered Activities

Covered Activities in the MSGCP are those used by private landowners within Douglas County in the preparation of soil for crop production, the cultivation of crops, and the production and culture of animal products and fiber for human consumption, animal feed, and/or sale as articles of trade or commerce. A comprehensive list of Covered Activities is shown in Table 1-3 and is divided into the following subcategories: dryland agriculture, rangeland, and irrigated agriculture.

The Technical Advisory Committee (TAC) consulted with the Private Landowners Committee (PLC) to develop activity lists for each of the agricultural groups. While it is difficult to identify every possible agricultural activity related to these groups, most farming activities were identified and will be covered in the MSGCP. Covered Activities were organized into groups of related practices. These groups were assigned activity numbers. Activity numbers are used in Tables E-6 through E-9 in Appendix E, where minimization and mitigation strategies for Covered Activities are also shown.

Table 1-3: Covered Activities in the Douglas County MSGCP

Activity #	Land Use	Activity Category	Covered Activities
1.1	Dryland Agriculture	Conversion Activities	Mowing, burning, plowing CRP/SAFE lands
1.2	Dryland Agriculture	Field Preparation	Mowing, burning stubble Plowing, disking, harrowing Roughing, coil packing Rock picking, removal
1.3	Dryland Agriculture	Weed/Pest Control*	Sub-soiling, rod-weeding, burning
1.4	Dryland Agriculture	Farm Infrastructure	Road Management and structures (fences, etc.) Wildlife reserves and water Irrigation systems from ground-water sources
1.5	Dryland Agriculture	Crop Management	Management of CRP/SAFE lands Seeding and fertilization Harvesting including swathing, baling, hauling and storage Grazing
2.1	Ranching	Range Improvement	Mowing, burning, brush beating Seeding
2.2	Ranching	Range Infrastructure	Road and trail development Water and structures (fences, etc.) development
2.3	Ranching	Livestock Management	Water and salt distribution Wintering, confinement, manure management Calving, feeding, vaccinations
3.1	Irrigated Agriculture**	Crop Maintenance	Planting, ripping, seeding, mowing Irrigation, fertilization, pollination, thinning, drying Harvesting, transportation, storage
3.2	Irrigated Agriculture**	Weed/Pest Control*	Pest control (birds and deer)
3.3	Irrigated Agriculture**	Infrastructure	Roads, trails, and fence management Irrigation systems from ground-water sources, crop-protection netting, wind machines

*The impact from application of pesticides (herbicides, rodenticides, etc.) is not a Covered Activity under the MSGCP consistent with a Region 1 Fish and Wildlife Service Policy from 1998, while impacts from the use of equipment, such as tractors, would be a covered activity. Current or future Section 7 consultations between the USFWS and the U.S. Environmental Protection Agency may cover those activities, and Applicants/Permittees will still voluntarily implement additional measures, such as no-spray buffers or integrated pest management, to focus pesticide use and minimize non-target impacts. Potential voluntary measures are listed on page E-11.

**Covered Activities include actions related to irrigation from ground water sources and from surface water sources on portions of creeks, tributaries, and lakes where those portions of the water bodies do not contain anadromous salmonids or bull trout. Covered Activities do not include irrigation water obtained from the mainstem Columbia River, or piped water from the Wenatchee River.

Habitat and Evaluation Process

The natural vegetation of Douglas County forms plant communities (habitats) in response to temperature, available moisture, soil characteristics, elevation, and geology. Six main native habitats and three non-native habitats found within the County are shown below.

Habitat Types

1. Shrub-steppe
2. Forest
3. Riparian
4. Wetlands
5. Cliffs and Talus
6. Water: Lakes and Streams
7. Conservation Reserve Program Lands (CRP), including SAFE lands (non-native)
8. Agricultural Lands (non-native)
9. Urban Areas (non-native)

These nine main habitat types have been further classified into 23 distinct land-cover types shown below. These land-cover types were identified through remote sensing, which can be repeated in future monitoring of the MSGCP project area. These land-cover types are associated with directly observable dominant plant communities. MSGCP Covered Species that occupy each of the dominant land cover types were identified by FCCD in collaboration with WDFW biologists (See Appendix G).

Land Cover Types[1]

1. Urban
2. Irrigated Forage Crops
3. Irrigated Orchard
4. Dryland Agriculture
5. Riparian, Large Trees and Shrubs
6. Three-tip Sagebrush, Moderate Cover
7. Three-tip Sagebrush, Dense Cover
8. Three-tip Sagebrush, Light Cover
9. Grasslands, Bare/Three-tip Sagebrush
10. Big Sagebrush, Moderate Cover
11. Big Sagebrush, Dense Cover
12. Stiff Sagebrush/Grasslands
13. Grasslands, Bare/Stiff Sagebrush
14. Bitterbrush, Moderate Cover
15. Bitterbrush, Dense Cover
16. Non-Shrub-steppe, Moderate Brush Cover
17. Non-Shrub-steppe, Dense Brush Cover
18. Non-Shrub-steppe, Light Brush Cover
19. Non-Shrub-steppe, Grasslands/Bare Ground
20. Grasslands, Burned 2005
21. Conifer Forest
22. Rock and Rubble, Talus
23. Water

[1]*Land cover type classes determined from classification of Landsat TM imagery scenes, April and July 2005. See Appendix G.*

Relationship to Federal and State Statutes

The following of Federal and State statutes affected and/or guided the development of this MSGCP:

1. Clean Air Act of 1956, as amended (42 U.S.C. §7401 et seq.)
2. Farm Security and Rural Investment Act of 2002, Food Conservation and Energy Act of 2008, and Agriculture Act of 2014 (P.L. 107-171 and P.L. 110-234)
3. Federal Endangered Species Act of 1973, as amended (16 U.S.C. §§1531-1544)
4. Federal Insecticide, Fungicide, and Rodenticide Act of 1947, as amended (P.L. 80-104)
5. Federal Land Policy and Management Act of 1976, as amended (P.L. 94-579)
6. Federal Noxious Weed Act, as amended (P.L. 93-629; 7 U.S.C. 2801 et seq.)
7. Federal Water Pollution Control Act of 1948, as amended (33 U.S.C. §1251-1376)
8. Food Quality Protection Act of 1996, as amended (P.L. 104-170)
9. National Environmental Policy Act of 1969, as amended (P.L. 91-190)
10. National Historic Preservation Act of 1966 (P.L. 89-665), as amended (16 U.S.C. 470 et seq.)
11. Washington State Endangered, Threatened, and Sensitive Species (WAC Chapters 232-12-014 and 232-12-011)
12. Washington Hydraulic Code (WAC Chapter 77.55)
13. Washington State Clean Air Act (RCW Chapter 70.94)
14. Washington State Environmental Policy Act (RCW Chapter 43.21C)
15. Washington State Ecosystem Standards (HB 1309)
16. Washington Water Law (RCW Chapter 90)
17. Watershed Planning Act of Washington (RCW Chapter 90.82)
18. Secretarial Order 3206
19. Washington State Regulatory Fairness Act (RCW Chapter 19.85)

1. Clean Air Act of 1963 as amended

While the Clean Air Act was originally passed in 1963, little of that original legislation remains in effect today. Instead, the term "Clean Air Act" generally applies to three major sets of amendments to the original act that were passed in 1970, 1977, and 1990. The primary objective of the Clean Air Act (42 U.S.C. §7401 et seq.) (CAA) is to establish Federal standards for air pollutants from stationary and mobile sources and to work with the states to regulate polluting emissions. The CAA outlines a process where individual states must create and implement their own plans to reach the desired goals. The MSGCP utilizes many BMPs designed to reduce airborne particulates to benefit local, State, and regional air quality implementation plans. Sources of dust and odors from agricultural standard and typical activities are explicitly exempt from the CAA, but the MSGCP will work to reduce the impacts from Covered Activities.

2. Farm Security and Rural Investment Acts

The Farms Security and Rural Investment Acts or other Acts known as "Farm Bills" are subject to revisions over time. The Farm Security and Rural Investment Act of 2002 (2002 Farm Bill)

(P.L. 107-171) was signed into law on May 13, 2002. The Food, Conservation and Energy Act of 2008 (2008 Farm Bill) (P.L. 110-234), was enacted on June 18, 2008, and was very similar in form to the 2002 Farm Bill but increased the total funding for the above conservation title programs by $4.5 billion. The Agriculture Act of 2014 (2014 Farm Bill) was enacted on February 7, 2014, and retained many of the previous programs. Significant conservation programs under the 2014 Farm Bill or continued from previous Farm Bills that may be used in Douglas County include, but are not limited to:

- *Conservation Reserve Program* (CRP) offers annual rental payments and cost-share assistance to farmers to establish long-term conservation covers (e.g., grass and shrubs) on eligible land. Contracts are for a minimum of 10 years and a maximum of 15 years.
- *CRP Continuous Sign-up* for high-priority practices allows enrollment of land in riparian buffers, filter strips, grass waterways, and other high-priority practices without competition. Acres enrolled under continuous sign-up count toward the overall CRP acreage cap.
- *State Acres for Wildlife Enhancement* (SAFE) is a program under CRP that allows enrollment of land to support State and regional high-priority wildlife objectives. Conservation Practices currently offered under CRP are fine-tuned through SAFE to improve, connect, or create higher-quality habitat to promote healthier ecosystems in areas identified as essential to effective management of high-priority species on generally smaller acreages.
- *Conservation Reserve Enhancement Program* (CREP) is a joint State-Federal program that targets specific agriculture-related environmental problems that are significant at the State or National level. Acres enrolled under CREP count toward the overall CRP acreage cap.
- *Environmental Quality Incentives Program* (EQIP) provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat. EQIP includes Working Lands for Wildlife and the *Sage Grouse Initiative* (SGI) that improves sagebrush habitat and restores or enhances rangeland. The SGI provides predictability to the landowner that the conditioned conservation practices will continue to benefit wildlife as long as they are implemented -any ESA issues associated with their implementation have been fully addressed. If the species is listed, incidental take that may be caused by the practices identified in the conservation plan is exempted.
- *Conservation Stewardship program* The Conservation Stewardship Program helps agricultural producers maintain and improve their existing conservation systems and adopt additional conservation activities to address priority resources concerns. Participants earn CSP payments for conservation performance—the higher the performance, the higher the payment. Through CSP, participants take additional steps to

improve resource condition including soil quality, water quality, water quantity, air quality, and habitat quality, as well as energy.

- *Conservation of Private Grazing Land* (CPGL) authorizes technical and educational assistance for conservation and enhancement of private grazing lands.
- *Agriculture Conservation Easement Program* The Agricultural Conservation Easement Program (ACEP) provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Under the Wetlands Reserve Easements component, NRCS helps to restore, protect and enhance enrolled wetlands.

3. Federal Endangered Species Act of 1973 as amended

The Endangered Species Act of 1973 (ESA) (16 U.S.C. §§1531-1544), as amended, provides "...a means whereby the ecosystems upon which endangered species depend may be conserved" (16 U.S.C. §1531[b]). The USFWS (Service) is responsible for listing candidate species, subspecies, or distinct population segments as threatened or endangered (16 U.S.C. §1533). Once a species is listed, the ESA protects the species and its habitat (16 U.S.C. §§1538, 1540), through several mechanisms.

Under Section 7 of ESA (16 U.S.C. §1536[a][2]), Federal agencies are required to further the purposes of the ESA and consult with the Service to ensure Federal actions are not likely to jeopardize the continued existence of a listed species or adversely modify or destroy critical habitat. The term "Federal action" is defined by regulation and includes actions such as the granting of permits, entering contracts or leases, or participating in projects or funding such projects (50 C.F.R. §402.02). Approval of an incidental take permit is a Federal action and, therefore, subject to consultation under Section 7 of the ESA. If, after consultation, a biological opinion issued by the Service determines that a Federal action is not likely to jeopardize a listed species or destroy or adversely modify critical habitat, the Service will provide an incidental take statement exempting the incidental take of listed species associated with the Federal action from the prohibitions of ESA section 9 (described below). Thus, Federal agencies may engage in an activity or authorized activity that results in the take of listed species as long as such take does not jeopardize the continued existence or survival of the listed species.

Section 9 of the ESA prohibits, among other things, the unauthorized taking of endangered species (16 U.S.C. §1538(a)(1)(B)). The term "take" is defined to include "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" or attempt to engage in such activity, related to a species listed as endangered under the ESA (16 U.S.C. §1532(19)). The USFWS has extended such prohibitions by rule to threatened species. "Harm" in the definition of "take" in the ESA, means an act that actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. (50 C.F.R. 17.3). "Harass" means an intentional or negligent act or omission, which creates the likelihood of

injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns that included, but are not limited to, breeding, feeding, and sheltering.

Individuals and non-Federal entities without an incidental take permit, who undertake otherwise lawful actions that lead to the take of a listed species, risk violating Section 9 take prohibitions and related sanctions. Section 10(a)(1)(b) of the ESA authorizes the Service to issue permits for incidental take of listed species. An incidental take permit (ITP) allows a non-Federal entity to receive a permit that authorizes take that might occur "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (16 U.S.C. §1539(a)(1)(B); 50 CFR §17.3). An applicant must submit a Habitat Conservation Plan (HCP) to obtain an incidental take permit. This plan must specify, among other things, the impacts that are likely to result from the taking and the steps that will be undertaken to minimize and mitigate such impacts (16 U.S.C. §1539(a)(2)(A); 50 CFR §17.22(b)(1)).
Agencies such as the USFWS, however, may not issue ITPs or approve HCPs if so doing would jeopardize the continued existence of a listed species (16 U.S.C. §1539(a)(2)). This directive means that the proposed Federal action would not "…reasonably…be expected, directly or indirectly, to reduce appreciably the likelihood of both survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR §402.02).

Recovery of listed species is not the primary objective of the conservation planning process. The ESA's HCP approval criteria however, help to ensure that HCPs are consistent with recovery goals prepared for each listed species. The HCP must show that the applicant or permittee's conduct "…will not appreciably reduce the likelihood of the survival and recovery of the species in the wild" (16 U.S.C. §1539 (a)(2)(B)(iv)). An HCP should ensure that recovery opportunities are thoroughly considered based on known limiting factors for the species, even if there is no recovery plan for a species. In addition, an HCP is not a replacement or substitute for a recovery plan, but can be part of the effort to recover a species.

Criteria for Issuance of a Permit for Incidental Taking

The Service must consider criteria set forth in the ESA and its implementing regulations in deciding whether to issue a Section 10 permit for the incidental take of federally listed species (16 U.S.C. §1539(a)(2)(A)). The Service shall issue the incidental take permit whenever the applicant's HCP satisfies the following criteria:

1. The taking will be incidental. All taking of listed wildlife species as detailed in the HCP must be incidental to otherwise lawful activities and not the purpose of such activities.
2. The applicant will, to the maximum extent practicable, minimize and mitigate the impact of such taking. Under this criterion, the USFWS will determine whether the mitigation program the applicant proposes in the HCP meets statutory requirements.

3. The applicant will ensure adequate funding for the HCP. Funding sources and levels proposed by the applicant must be adequate to meet the purposes of the HCP.
4. The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild. This criterion involves the effects of the project on the likelihood of survival and recovery of affected species.
5. The applicant will ensure that other measures that the USFWS may require as being necessary or appropriate will be provided. This criterion gives the USFWS flexibility to require additional measures as a condition of the permit as necessary or appropriate among many different proposals affecting many different species.

Under Section 10(a)(1)(a) of the ESA, the Service may also issue a permit for a "Safe Harbor Agreement." Safe Harbor Agreements are agreements between the USFWS and cooperating non-Federal landowners that promote management for listed species on non-Federal property while giving assurances to participating landowners that no additional future regulatory restrictions will be imposed. The agreements benefit endangered and threatened species while giving landowners assurances from additional restrictions. Following development of an agreement, the USFWS will issue an "enhancement of survival" permit, to authorize future incidental take back to the original baseline or to an elevated baseline if the landowner complies with the terms of the Safe Harbor Agreement. There is a Safe Harbor Agreement in place for the Columbia Basin pygmy rabbit throughout its historic range in Washington; 17 landowners in Douglas and Grant Counties have signed up for this agreement as of July 2013. For enrolled landowners, this safe harbor agreement clarifies baseline levels of pygmy rabbits, provides for future incidental take of pygmy rabbits, and ensures cooperation between the applicants, the USFWS, and WDFW as recovery efforts proceed.

4. Federal Insecticide, Fungicide, and Rodenticide Act, as amended

The primary focus of the Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (P.L. 80-104), as amended, (FIFRA) (7 USC 136-136y) is to provide Federal control of pesticide distribution, sale, and use. The U.S. Environmental Protection Agency (EPA) was given authority under FIFRA not only to study the consequences of pesticide usage, but also to require users (farmers, utility companies, and others) to register when purchasing pesticides. The MSGCP will not directly come under any aspect of FIFRA, but many of the farmers and ranchers included under the MSGCP are affected by FIFRA.

5. Federal Land Policy and Management Act of 1976, as amended

The Federal Land Policy and Management Act of 1976 (P.L. 94-579) (FLPMA), as amended, constitutes the organic act for the Bureau of Land Management and governs most uses of BLM-managed lands, including grazing. The FLPMA requires the BLM to execute its management powers under a land-use planning process that is based on multiple-use and sustained-yield

principles. The FLPMA also provides for public land sales, withdrawals, acquisitions, and exchanges. Grazing guidelines in the MSGCP are similar to those expected under FLPMA.

6. Federal Noxious Weed Act, as amended

The Federal Noxious Weed Act of 1975, as amended, (P.L. 93-629; 7 U.S.C. 2801 et seq.), established a Federal program to control the spread of noxious weeds. The Secretary of Agriculture was given the authority to designate plants as noxious weeds by regulation and was given additional authorities to control the spread of such weeds. The Secretary is also authorized to cooperate with other Federal, State and local agencies, farmers' associations, and private individuals in efforts to control, eradicate, or prevent or retard the spread of such weeds.

7. Federal Water Pollution Control Act of 1948, as amended

The Federal Water Pollution Control Act (Clean Water Act or CWA) (33 U.S.C. §1251-1376), has been amended on many occasions, most notably in 1972 (P.L. 92-500), and is the principal Federal legislation directed at protecting water quality. The CWA is administered by the EPA and State water-quality agencies. Each state implements and carries out Federal provisions. States also approve and review National Pollutant Discharge Elimination System applications and establish total maximum daily loads for rivers, lakes, and streams. The states are responsible for setting the water quality standards needed to support all beneficial uses, including protection of public health, recreational activities, aquatic life, and water supplies. The Washington State Water Pollution Control Act, codified as Revised Code of Washington Chapter 90.48, designates the Washington State Department of Ecology (Ecology) as the agency responsible for carrying out the provisions of the Federal Clean Water Act within Washington State. Ecology is responsible for establishing water quality standards, making and enforcing water quality rules, and operating waste discharge permit programs. These regulations are described in Washington Administrative Code 173.

The CWA prohibits the discharge of pollutants to navigable waters of the United States unless such discharge is authorized pursuant to a National Pollution Discharge Elimination System Permit (NPDES) (33 U.S.C. §1341). Similarly, Washington State statutes require a wastewater discharge permit before discharging pollutants to the waters of the State (RCW Chapter 90.48). The HCP will take into consideration available opportunities to meet or exceed protections and requirements of the CWA and Washington law through on-farm practices.

8. Food Quality Protection Act of 1996

With the enactment of the Food Quality Protection Act of 1996 (P.L. 104-170) (FQPA), Congress presented EPA with an enormous challenge of implementing the most comprehensive and historic overhaul of the Nation's pesticide and food safety laws in decades. The FQPA amended the FIFRA and the Federal Food, Drug, and Cosmetic Act by fundamentally changing the way EPA regulates pesticides. The MSGCP will not directly come under any aspect of FQPA, but many of the farmers and ranchers included under the MSGCP do.

9. National Environmental Policy Act of 1969, as amended

The USFWS must comply with the National Environmental Policy Act of 1969 (P.L. 91-190) (NEPA), as amended (42 U.S.C. §4321 et seq.), and the regulations of the Council on Environmental Quality in evaluating the impacts of issuing take permits. The requirements of NEPA, described in Section 102 of the statute (42 U.S.C. §4332[C]), are normally triggered by any major Federal action that significantly affects the quality of the human environment (see 40 CFR §1508.18 et seq.).

The NEPA process in the context of this MSGCP is intended to foster an appropriately complete and full disclosure of the environmental issues surrounding the proposed Federal action (i.e., issuance of an incidental take permit). The NEPA process also encourages public involvement to plan, identify, and assess a range of reasonable alternative actions. It also encourages public involvement at it explores all practical means to enhance the quality of the human environment and to avoid or minimize adverse environmental impacts that may arise from the issuance of take permits.

The USFWS uses an internal and a public scoping process to determine the appropriate steps related to any proposed action falling under NEPA. Depending upon the scope and impact of the action, NEPA requirements can be satisfied in one of three ways: 1) categorical exclusion, 2) Environmental Assessment (EA), or 3) Environmental Impact Statement (EIS). The USFWS has developed an Environmental Assessment to determine if an Environmental Impact Statement is required.

NEPA requires the identification and discussion of probable significant adverse environmental impacts related to any proposed action. NEPA also requires an examination of environmental effects not specifically addressed by other laws. This integrated assessment is an important aspect of the relationship between NEPA and HCPs. Together these processes allow Federal agencies and applicants to evaluate environmental impacts as a part of their planning and decision-making process.

10. National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act of 1966 (P.L. 89-665), as amended (16 U.S.C. 470 et seq.), (NHPA) expects Federal agencies to take into account the effects of proposed actions on properties eligible for inclusion in the National Register of Historic Places. "Properties" are defined herein as "cultural resources," which includes prehistoric and historic sites, buildings, and structures that are listed on or eligible for inclusion on the National Register of Historic Places. An "undertaking" is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency. The interface of the NHPA with the MSGCP could occur when an activity addressed in the ITP

(including "Covered Activities" and BMPs) disrupts soils below the common and historic tillage depth or if activities disturb the soil in a previously unfarmed or undisturbed area. The MSGCP includes a process to ensure that section 106 of the NHPA is considered by the USFWS or other involved Federal agencies as appropriate (see Appendix F).

11. Washington State Endangered, Threatened, and Sensitive Species

The State of Washington has Species of Concern listings (Washington Administrative Code [WAC] Chapters 232-12-014 and 232-12-011) that include all State endangered, threatened, sensitive, and candidate species. State Monitor species are not considered Species of Concern, but are monitored for status and distribution. These latter species are managed by WDFW, as needed, to prevent them from becoming endangered, threatened, or sensitive. The State list is separate from the Federal list; the State list includes species status relative to Washington State jurisdiction only. Critical wildlife habits associated with State or Federally listed species are identified in WAC Chapter 222-16-080.

12. Washington State Hydraulic Code

Under the Washington State Hydraulic Code (WAC Chapter 77.55), a Hydraulic Project Approval permit (HPA) from WDFW is required for any construction activity in or near State waters. An HPA is also required for the performance of other work that will use, divert, obstruct, or change the natural flow or bed of any waters of the State. An HPA allows the WDFW to condition such construction or work activity to protect fish and their habitats.

13. Washington State Clean Air Act

The Washington State Clean Air Act (RCW 70.94) enacts similar actions to the National Clean Air Act to promote and preserve the State's air quality. Agricultural operators creating odors and fugitive dust from their farm activities are exempt from this Act. The MSGCP, however, strives to reduce the impacts from farming and ranching activities on air quality in the Plan Area through the use of BMPs.

14. Washington State Environmental Policy Act (SEPA)

The Washington State Environmental Policy Act has four main objectives as listed in the SEPA Handbook (RCW Chapter 43.21C):

- To declare a State policy that will encourage productive and enjoyable harmony between people and their environment;
- To promote efforts that will prevent or eliminate damage to the environment and biosphere;
- To stimulate the health and welfare of people; and,
- To enrich the understanding of ecological systems and natural resources important to the State and Nation.

Washington State and local governments consider environmental issues in their decision-making processes through compliance with SEPA. SEPA is similar to NEPA, which applies to Federal rather than State permits. It is possible that some actions must comply with both SEPA and NEPA and related regulations. Completion of the Draft EA for the MSGCP would satisfy the requirements of the State Environmental Policy Act under RCW 43.21C.150. "The requirements of RCW 43.21C.030(2)(c) pertaining to the preparation of a detailed statement by branches of government shall not apply when an adequate detailed statement has been previously prepared pursuant to NEPA, in which event said prepared statement may be utilized in lieu of a separately prepared statement under RCW 43.21C.030(2)(c)."

15. Washington State Ecosystem Standards

The Washington State Legislature passed House Bill 1309 pertaining to ecosystem standards in 1993. Ecosystem standards are intended to maintain and restore fish and wildlife habitat by improving ecosystem health on agricultural land, rangeland, and woodland where grazing occurs on lands managed by WDNR and WDFW. Ecosystem standards are goals that land managers should be working towards to achieve the desired ecological condition as defined under the standard. The MSGCP is consistent with these goals by implementing appropriate BMPs. WDNR and WDFW are expected to continue to follow HB 1309 requirements, at minimum, in the management of their lands within the MSGCP project area.

16. Washington Water Law

Water use in Washington State is regulated through a state permit and certificate system (RCW Chapter 90). A water-right permit or certificate is required for all uses of surface water (lakes, ponds, rivers, streams, or springs) since the Surface Water Code was enacted in 1917. A water-right permit or certificate is also required for non-exempt groundwater withdrawals that began after the adoption of the Ground Water Code in 1945.

17. Watershed Planning Act of Washington

In 1998, the Washington State Legislature passed the Watershed Planning Act (RCW Chapter 90.82) to provide a framework for local citizens, interest groups, and government organizations to collaboratively identify and address water-related issues in each of the 62 Water Resource Inventory Areas (WRIAs) in the State. Local and Tribal governments convened in the Fall of 1998 to initiate watershed planning for water resources in the Moses Coulee and Foster Creek Water Resource Inventory Areas (WRIAs 44 and 50). Initiating governments included Douglas County, Grant County, Okanogan County, City of East Wenatchee, City of Bridgeport, Bridgeport Irrigation District #1, East Wenatchee Water District, and the Confederated Tribes of the Colville Reservation. A thirty-one-member planning unit met on a monthly basis from January 2000 to September 2004 to determine how best to manage the water resources.

The mission of the Douglas County Watershed Planning Association (DCWPA) was to create an ongoing plan that provides local citizens with the maximum possible input concerning their goals and objectives for water resource management and development in Washington State Water Resource Inventory Areas (WRIAs) 44 and 50. The DCWPA agreed to include in their watershed planning efforts the water quantity component and all optional elements including water quality, habitat and instream flows, and supplemental studies on lake water quality and water storage. A final report, *Watershed Management Plan: Moses Coulee and Foster Creek-Watersheds, WRIA 44 & 55*, was released in September 2004. The implementation of the watershed management plan began in March 2005.

18. Secretarial Order 3206

Secretarial Order 3206 was issued by the Secretary of the Interior in June 1997. The Order lays out responsibilities, procedures, and processes that the Department of Interior are to following when implementing the Endangered Species Act in situations that involve Indian Treaty Rights, Tribal Trust Lands, or other interests that fall under the category of Federal-Tribal Trust Responsibilities.

Specifically: "This Order clarifies the responsibilities of the component agencies, bureaus and offices of the Department of the Interior when actions taken under authority of the Act and associated implementing regulations affect, or may affect, Indian lands, tribal trust resources, or the exercise of American Indian tribal rights, as defined in this Order. This Order further acknowledges the trust responsibility and treaty obligations of the United States toward Indian tribes and tribal members and its government-to-government relationship in dealing with tribes. Accordingly, the Departments will carry out their responsibilities under the Act in a manner that harmonizes the Federal trust responsibility to tribes, tribal sovereignty, and statutory missions of the Departments, and that strives to ensure that Indian tribes do not bear a disproportionate burden for the conservation of listed species, so as to avoid or minimize the potential for conflict and confrontation."

19. Washington State Regulatory Fairness Act (WSRFA)

The purpose of the WSRFA (RCW Chapter 19.85) is to reduce the economic impact of rules and regulations on small businesses in Washington. The Act has two main components: 1) when a Washington state agency adopts rules and regulations, that agency must prepare a Small Business Economic Impact Statement; 2) Washington State agencies must review rules and regulations periodically in order to minimize the economic impact on small businesses (RCW Chapter 19.85).

Relationship to Other Plans and Programs

Other plans and programs relevant to the MSGCP include adopted plans of the FCCD, various land-use management plans governing State and Federal lands in the Plan Area, and species management plans and conservation plans approved by state and/or Federal agencies.

Plans considered in the preparation of this MSGCP include:

- Washington State Water Resource Inventory Area (WRIA) 44/50 Basin Technical Assessments,
- Northwest Power and Conservation Council: *Upper-Middle Mainstem Subbasin Plan*, May 2004,
- Upper Columbia Salmon Recovery Board: *Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan*, August 2007,
- *Douglas County Countywide Comprehensive Plan*, May 2009,
- Douglas County Critical Areas Ordinance,
- *Douglas County Regional Shoreline Master Program*, August 2009,
- Bureau of Land Management: *National Sage-Grouse Habitat Conservation Strategy*, November 2004,
- U.S. Fish and Wildlife Service: *Recovery Plan for the Columbia Basin Distinct Population Segment of the Pygmy Rabbit (Brachylagus idahoensis)*, January 2013,
- U.S. Fish and Wildlife and Washington Department of Fish and Wildlife: *Template Safe Harbor Agreement for the Columbia Basin Pygmy Rabbit*, October 2006,
- State of Washington Columbian Sharp-tailed Grouse Recovery Plan, July 2012,
- State of Washington Greater Sage-Grouse Recovery Plan, May 2004.

Douglas County Multiple Species Conservation Plan

Chapter 2: Plan Area Profile

Chapter Overview

Chapter 2 describes the Plan Area and includes descriptions of geographic setting, demographics, land use, and biological resources.

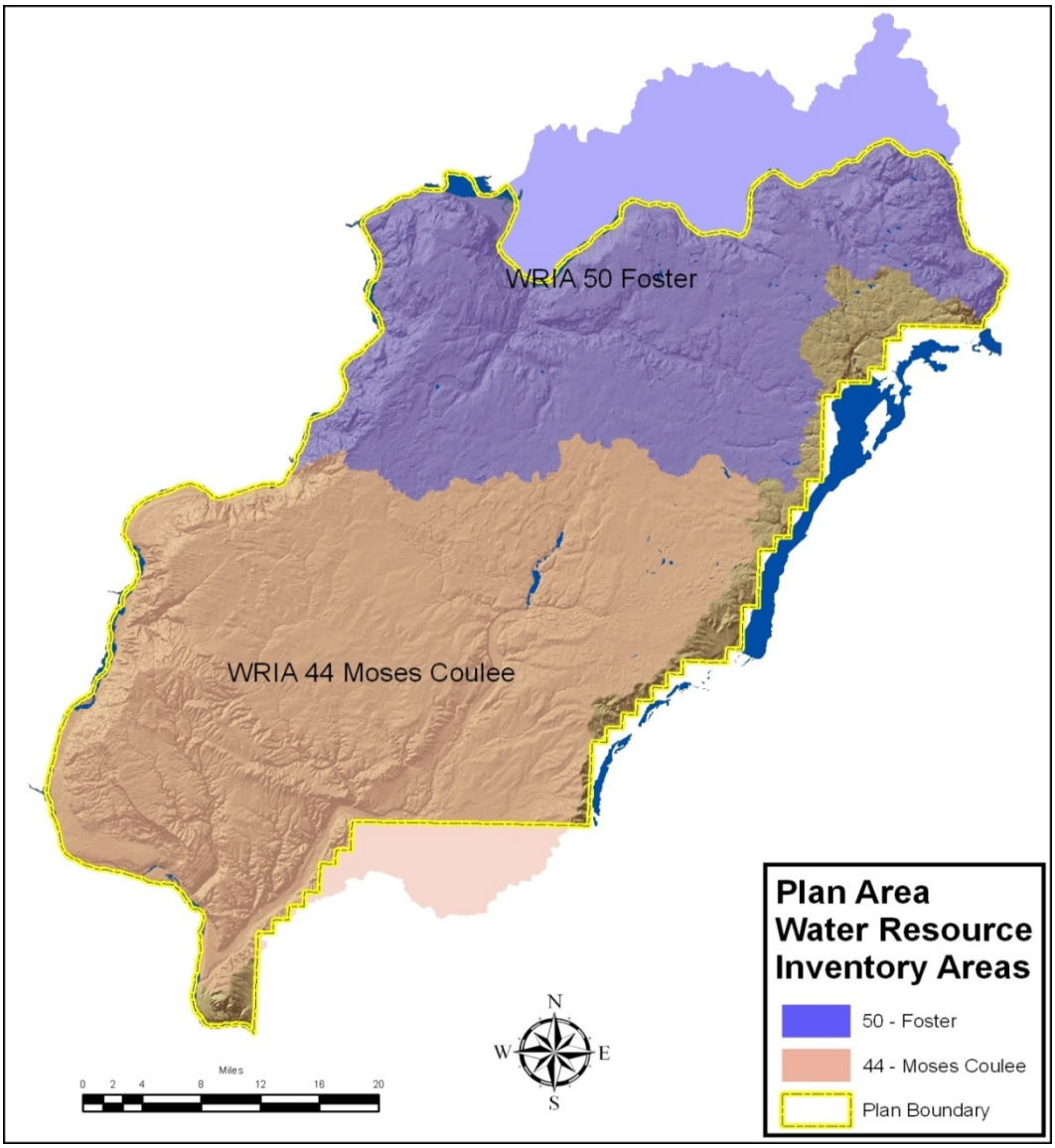

Figure 2-1: Location of State Water Resource Inventory Areas 44 and 50

Geographic Setting

The Plan Area includes all of Douglas County, Washington. The county is approximately 1,183,414 acres in size and is located close to the geographical center of Washington State. It lies on the northern edge of the Columbia Basin, just east of the Cascade Mountains. The Columbia River is the Plan Area's boundary on the north, south, and west sides. On the east side, the county boundary lies just to the west of a chain of lakes, including Banks Lake and Sun Lakes.

Geology and Topography

The majority of Foster Creek Water Resource Inventory Area (WRIA) 50 and Moses Coulee WRIA 44 is rolling plateau, underlain by basalt bedrock, interspersed by intermittent drainages (Figure 2-1). General elevations range between 2,000 and 3,000 feet above mean sea level. Higher terrain is in the southwest at Badger Mountain and in the northeast in the Okanogan Highlands. Lower elevations include the Moses Coulee and areas along the Columbia River (Johnson 1974). WRIA 50 and WRIA 44 are part of a larger drainage, the Columbia River Watershed. A relatively small strip of land along the eastern county boundary is also included in the Plan Area, although this region is not part of WRIAs 44 or 50.

Climate

Average annual precipitation ranges from 6-24 inches, with an annual average of 11.2 inches (Figure 2-2).

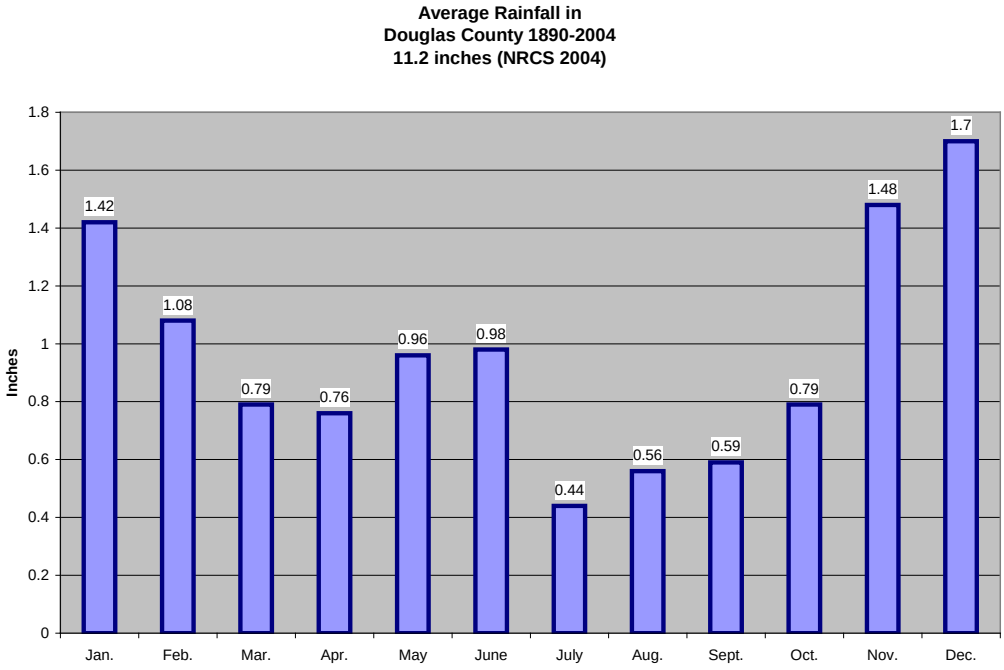

Figure 2-2: Precipitation Patterns in Douglas County (USFWS 2013)

Temperatures range from an average winter temperature of 26°F to an average summer temperature of 65°F in Waterville (2,640 ft. elevation) and an average winter temperature of 32°F to an average summer temperature of 71°F in East Wenatchee (780 ft. elevation) (USFWS 2013). Subfreezing temperatures occur 140 to 160 days per year. Frost penetration of the soil varies from one winter to the next depending upon soil type, vegetation cover, snow cover, and temperature. Average frost depth is 10 to 20 inches. Early snowfall insulates the ground and reduces the depth of freezing to a few inches, while lack of early snow results in freezing depths approaching 30 inches. Flooding and erosion often occurs when the underlying soil is frozen and there is heavy runoff from rain or snowmelt (Beieler 1981; Douglas County 1995; Johnson 1974).

Prevailing wind direction and speed varies according to topographic situation and season. Fifty mile-per-hour winds can be expected, on average, once in two years, and 70 mile-per-hour winds once in 25 years. High winds occur with greater frequency on exposed ridges and the upland surface of the watershed than on the floodplains (Thompson and Ressler 1988).

Climate change is currently being researched and discussed regionally and nationally. Habitats in Douglas County may be impacted by climate change, but we do not know exactly how, when, or to what extent. There are varying models and predictions for the changes that might be expected over the next 50 years and beyond. Minor temperature variations of one to three degrees Fahrenheit are predicted over the term of the MSGCP and this by itself may not have significant effects on the covered species. Potential changes to precipitation patterns and quantities within Douglas County are a more significant concern. Winter precipitation is predicted to come more in the form of rain and less in the form of snow in the Pacific Northwest (University of Washington 2013). Freeze-free season is predicted to increase, and precipitation may increase in winter, spring, and fall but decrease during summer (Kunkel et al. 2013). However, the effects of these climatic changes are difficult to predict for the covered species. Decreased summer precipitation may reduce native plant growth, primarily requiring reductions in grazing levels over current conditions. Landowners likely would change dryland-farming operations to adapt to the changed climate. Irrigated lands would not be directly affected by reduced precipitation, but ground water levels could be affected over the long-term.

Recent studies have looked at likely climate change and changes in biodiversity (Lawler and Mathias 2007). The biodiversity study summarized models that predicted that the shrub-steppe is likely to undergo changes in the coming century. Changes may include increased extent of woodlands, increased fires, and resultant decreased wildlife habitats and increased erosion. Cheatgrass (*Bromus tectorum*) invasion may worsen with increased fires, out-competing native perennials and further altering the fires regimes. Warmer and drier summers may also make the fire more frequent. Encroachment of woodlands and/or dry conifer forests or other vegetation changes may also be enhanced due to increased atmospheric CO_2 resulting in increased plant water-use efficiencies.

Little et al. (2009) explored possible climate change impacts to several agricultural commodities in eastern Washington, including wheat. Positive or negative changes to crops depend on the direct effects of climate, but they also depend on increasing atmospheric carbon dioxide, which can increase crop yields for some plants and also increase water use efficiency. Little et al. (2009) noted that the resulting CO_2 effect on plants could be temporary (plants may adapt to new conditions, or growth of plants may be limited by other factors), but mounting experimental evidence involving agricultural crops show a definite beneficial effect of "CO_2 fertilization" on growth and yield of many crops. The projections assumed that plants have adequate supply of nutrients and are well protected from pests and weeds. The researchers assessed potential changes for 2020, 2040, and 2080 scenarios with respect to a baseline climate (1975-2005). The wheat studies were based on sites at Pullman and Saint John, WA, neither of which is in Douglas County. Earlier maturity in response to warming will allow dryland winter wheat to avoid some water stress resulting in increases for the 2020s and unchanged or slightly increased for the 2040s; while spring wheat is likely to be unchanged through the 2020s, but decline in the 2040s through the 2080s. Increased CO_2 fertilization effects result in further increases, and compensate for the decreases in spring wheat until the 2040s (at the Saint John site).

Little et al. (2009) also conducted a literature review for the assessment of weed impacts from climate changes. Competition from weeds may increase, unless growers adapt accordingly. Most studies on climate change predict that pests, including weeds, may expand their geographic ranges in a changing climate. Warmer and wetter fall and winter weather may allow greater numbers and growth of annual weeds. The physiological plasticity of weeds and high degree of variation may provide weeds with a competitive advantage over crops [or other native vegetation].

Population

The estimated 2012 population of Douglas County is about 39,350 or about 21.3 persons/square mile (USDC 2012a). East Wenatchee is the largest city with a population of 13,438 and the County Seat, Waterville, has a 2010 population of 1,155 (USDC 2012b; USDC 2012c). Other incorporated cities include Rock Island, Mansfield, and Bridgeport. Over half the county population lives in unincorporated or rural areas.

Land Ownership and Use

Agricultural land use in Douglas County initially clustered around available ground and surface water sources. Most agricultural lands in production today were established in the late 1800s, when most of the county was homesteaded. Two current land use trends are apparent in the county: agricultural activities are consolidating into larger operations and agricultural land is being removed from production and converted to commercial, industrial, and residential uses. Commercial, industrial, and residential uses are not covered activities under the MSGCP. Lands covered by the MSGCP do not include private, non-agricultural lands (approx. 148,761 acres) or Federal lands (approx. 50,000 acres). Land-use zoning within Douglas County is shown in Figure 2-3.

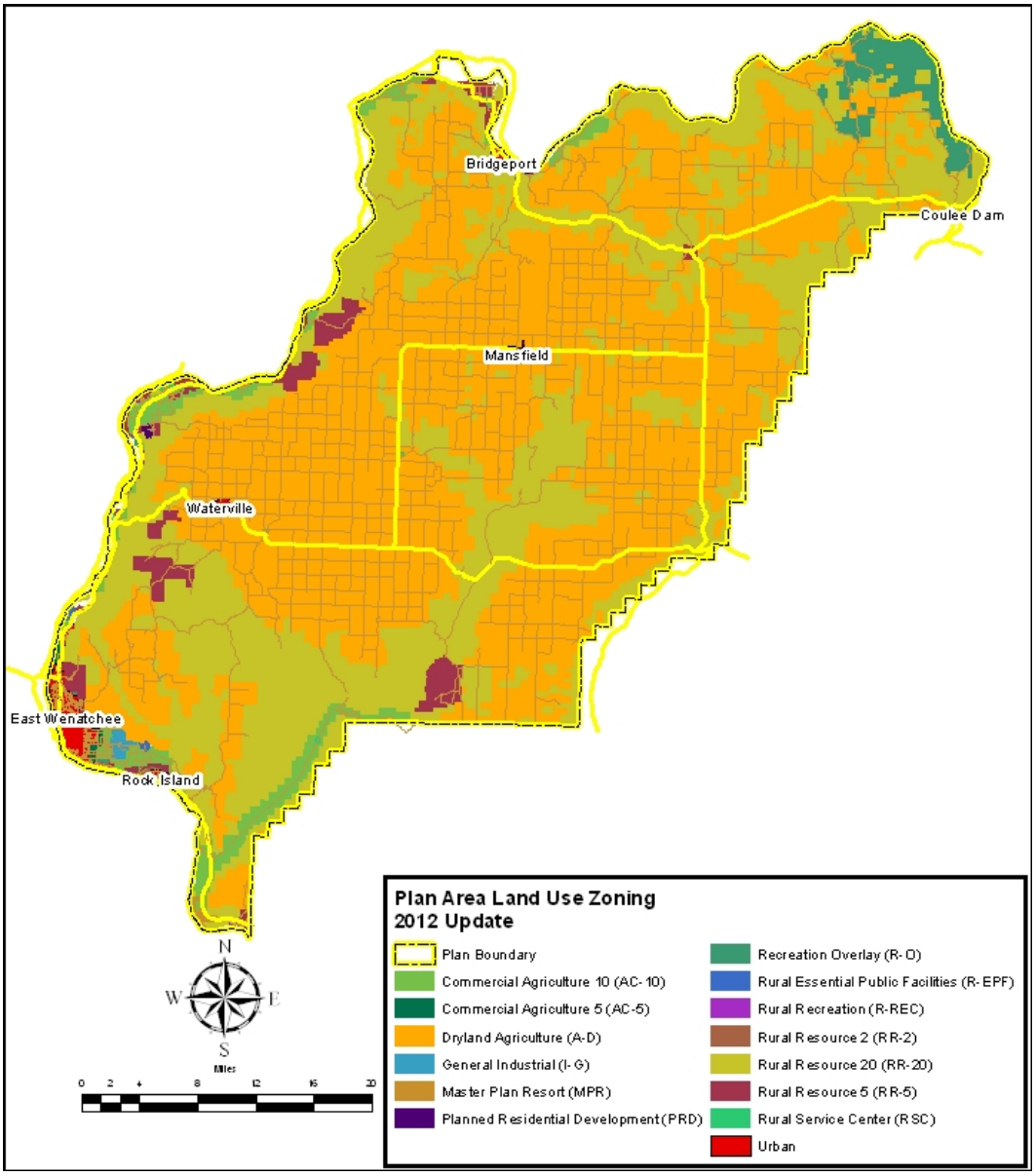

Figure 2-3: Current Land Use Zoning within Plan Area

The predominant land use in Douglas County is agriculture. Agricultural lands are defined as those involved in the preparation of soil for crop production, the cultivation of crops, and the production and culture of animal products and fiber for human consumption, feed and/or sale as articles of trade or commerce, including horticulture and commercial greenhouse operations. Currently, 1,027,628 acres of land are privately owned. Agricultural lands total 883,094 acres, of which 539,531 were classified as harvested cropland. Of the approximately 955 farms in the county, 157,898 acres are in wheat production, 4,291 acres are in barely and oat production, 14,551 acres are in orchards, and 4,099 acres are in forage production. There were over 12,000 head of livestock in 2007 (USDA 2007).

Orchard activities occur along the Columbia River corridor and to some extent in the lower portion of Moses Coulee. The remainder of the county, located on the Waterville Plateau, is where the majority of grain, crop, and livestock production currently occurs.

Within these major groups of land use types are some fragments and some larger blocks of shrub-steppe, meadow-steppe, riparian, and other habitats. The quality of these habitats varies from near natural to severely degraded. These habitat types are described later in the chapter and are displayed in Figures 2-6 and 2-8. The total acreage of all habitat types other than those classified as urban or cropland (including CRP lands) within Douglas County is approximately 270,000 acres.

Dryland Agriculture

Dryland crop farming takes up a large part of Douglas County's land area, particularly on the Waterville Plateau. The predominant crop is winter wheat grown in a fallow rotation. Every other year, the ground sits idle in order to increase moisture and mineral/nutrient content of the soil. Consequently, the average size of a dryland farm in the County is larger when compared to other wheat-growing counties in the State. Acreage in active production (not in fallow rotation) changes from year to year depending on precipitation.

Rangeland

Rangeland activity is primarily beef cattle production consisting of cow/calf operations. Calves are born in early spring and weaned in October and November. Because of soil types and climate, a portion of the land on the Plateau is not suitable for dryland crop production, but is adequate for rangeland grazing. The largest concentrations of rangeland areas are located at the fringes of the Waterville Plateau, immediately adjacent to basalt cliff breaks.

Irrigated Agriculture

The predominant agricultural activity along portions of the Columbia River corridor is irrigated tree-fruit production. The availability of irrigation water, in addition to sandy, well-drained soils and long, warm growing seasons support orchards. Irrigated agriculture extends up into Moses Coulee, where alfalfa hay and other forage are also produced. The 2007 Census on Agriculture estimated approximately 20,000 acres of irrigated agriculture occur in Douglas County.

Conservation Reserve Program

The CRP allows farmers to enroll some of their cropland into a 10-year plan of maintaining cover crop, as opposed to typical winter wheat/ fallow rotation that involves harvesting and replanting. This is a multiple use, federally-funded program designed to conserve soil and water and to provide wildlife habitat.

The Federal government pays an established dollar amount per acre to the farmer to keep that ground out of production, but maintained with an adequate vegetative cover and noxious weed control. Specific species vary, but include native forges, grasses, and shrubs.

Figure 2-4: Conservation Reserve Program lands in Douglas County

As of 30 June 2013, 182,072 acres are enrolled in CRP or similar programs within Douglas County. This includes approximately 63,000 acres enrolled in the U.S. Department of Agriculture State Acres for Wildlife Enhancement (SAFE) program to be managed as conservation cover specifically designed for greater sage grouse and Columbian sharp-tailed grouse (Michele Ruud, personal communication 2013). These acreage quantities vary by year and depend on program funding and signup opportunities.

Habitat Conservation Areas

Several entities have emphasized wildlife habitat, multiple-use lands, and conservation lands in the County. The three largest entities are the Bureau of Land Management (BLM), which manages 53,965 acres, The Nature Conservancy (TNC), which manages 21,676 acres, and the Washington Department of Fish and Wildlife (WDFW), which manages 16,361 acres. These lands are referred to as Habitat Conservation Areas and are described in more detail in Chapter 3.

Transportation

The most important mode of transportation in Douglas County is surface roads. The road network provides delivery routes for agricultural products traveling from farms and ranches to storage or processing points. Roads also facilitate the delivery of supplies and equipment to farms and ranches and the movement of farm equipment.

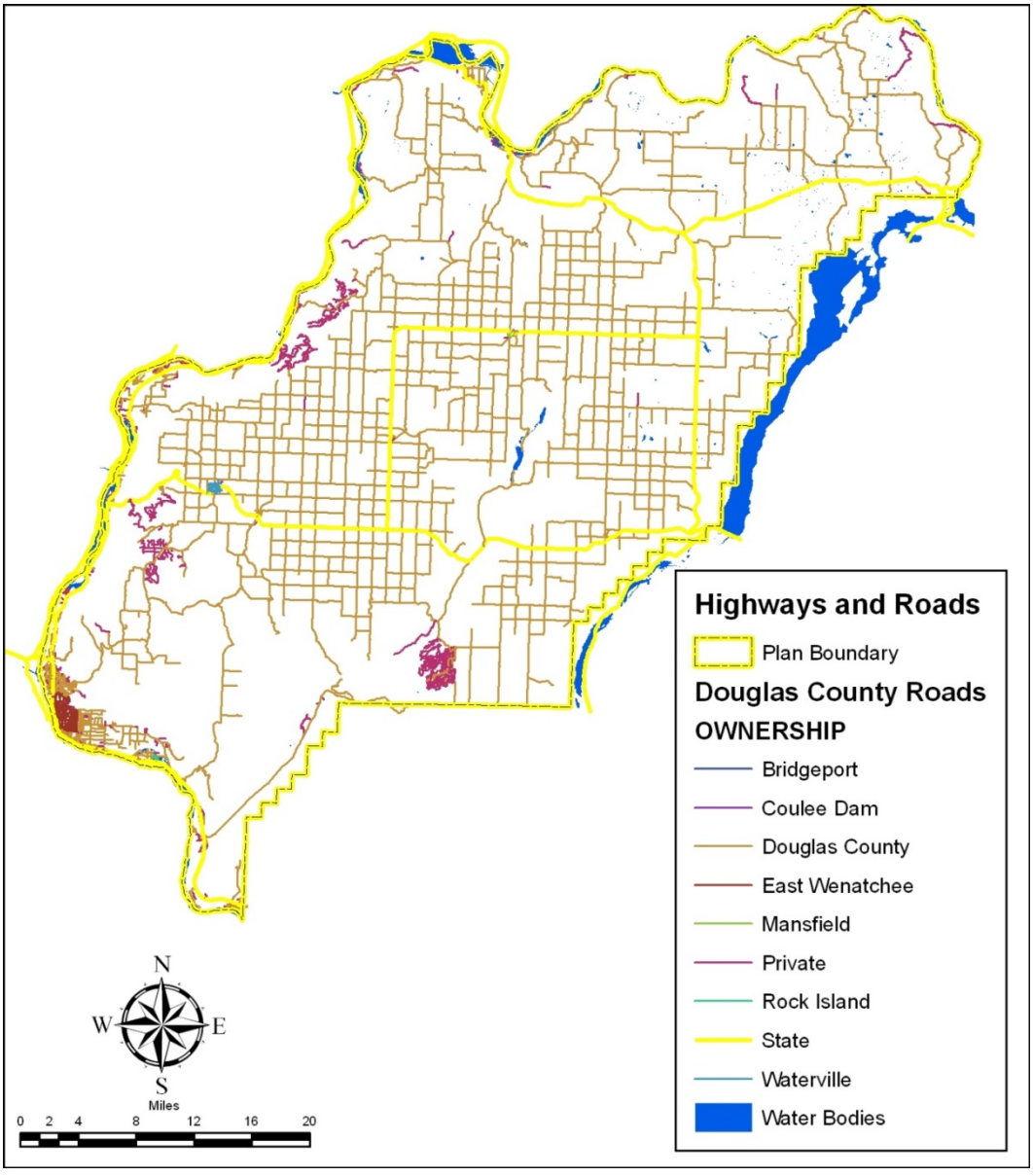

Figure 2-5: Transportation Routes in Douglas County

The primary east-west route is US 2, which runs across the county from near Coulee City to just north of East Wenatchee. SR 97 enters the county near East Wenatchee and runs north along the shore of the Columbia River before exiting the county near Chelan. On the east side of the county,

SR 17 runs north from near Coulee City to Bridgeport. SR 174 runs from Coulee Dam to Leahy, while SR 172 travels from Sims Corner to Farmer. Finally, SR 28 enters the county at the extreme southern tip and runs north along the Columbia River to East Wenatchee. Most roads are managed and maintained by the county and are concentrated in the middle two-thirds of the county, with reduced access in the southern and northern areas (Figure 2-5).

Biological Resources

Habitat

Habitat in Douglas County is a mix of shrub-steppe, grassland, cliffs and talus, forest, and riparian/ wetland. The County totals 1,183,414 acres, 1,027,628 acres of which is privately owned. Some of the agricultural lands within the County support a portion of the life history needs of some species covered by this MSGCP (such as cover, forage, or travel corridors), but much of the shrub-steppe has been fragmented over time. The estimated total acreage of shrub-steppe historically within the Plan Area was 1,095,016 acres, of which 502,709 acres remain today, a reduction of 56 percent (Daubenmire 1968; 1970). The effects of habitat loss and fragmentation are summarized in an excerpt from *Status of Washington's Shrub-steppe Ecosystem* (Dobler et al. 1996):

> *"Although the magnitude of agricultural conversion of Washington's shrub-steppe is impressive, its effect on wildlife may be magnified by a pattern of land alteration that has resulted in extreme fragmentation of the remaining habitat. Species tend to evolve in concert with their surroundings, and for shrub-steppe wildlife this would mean species adapted to expansive landscapes of steppe and shrub-steppe communities. When landscapes are fragmented by conversion to land-use types different from what occurred naturally, wildlife that depends on the remnant native habitat may be subjected to adverse population pressures, including: isolation of breeding populations; competition from similar species associated with other, now adjacent, habitats; increased nest predation by generalist predators; and increased nest loss through parasitism by brown-headed cowbirds. It is not known to what extent these population pressures affect birds in fragmented shrub-steppe environments, although a recent study from Idaho (Knick and Rotenberry 1995) suggests that landscape characteristics influence site-selection by some shrub-steppe birds (Wiens et al. 1985; 1987). Most research on fragmentation effects on birds has occurred in the forests and grasslands of eastern and central North America, where conversion to agriculture and suburban/urban development has created a landscape quite different from that which existed previously. The potential for fragmentation to adversely affect shrub-steppe wildlife in Washington warrants further research."*

The natural vegetation of Douglas County varies in response to temperature, available moisture, soil characteristics, elevation, landforms, and geology, creating diverse fish and wildlife habitats. The MSGCP places habitat types into the following groups, which are described in subsequent paragraphs.

Habitat Types

1. Shrub-steppe
2. Conifer Forest
3. Riparian
4. Wetlands
5. Cliffs and Talus
6. Water: Lakes and Streams
7. Conservation Reserve Program Lands (CRP)
8. Agricultural Lands (non-native)
9. Urban Areas (non-native)

Shrub-steppe

Shrub-steppe (sagebrush/grass) plant communities are the most widespread natural vegetative cover in Douglas County and are found largely on the upland areas, dry ravines, and slopes that lead to larger stream or river channels. Shrub-steppe plant communities in Douglas County were historically co-dominated by shrubs and perennial bunchgrasses with a microbiotic crust of lichens and mosses on the surface of the soil.

Woody perennial shrub species include three-tip sagebrush (*Artemisia tripartita*), big sagebrush (*Artemisia tridentata*), stiff sagebrush (*Artemisia rigida*), bitterbrush (*Purshia tridentata*), and rabbitbrush (*Chrysothamnus nauseosus*). Perennial and annual grasses species include bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), and Sandberg bluegrass (*Poa secunda*).

Biological soil crust is an integral component of shrub-steppe. Biological soil crusts, also known as "cryptobiotic crust," "microbiotic crusts," or "cyanobiotic crusts," are fragile microfloral communities composed of blue-green algae, bacteria, fungi, mosses, and lichens. These crust communities play an important role in stabilizing soils from wind and water erosion, contributing to soil productivity, influencing nutrient levels, retaining moisture, altering soil temperature, and aiding seedling establishment (Paige and Ritter 1999).

Deep soil shrub-steppe habitat has largely been converted to agriculture, leaving shrub-steppe intact on shallow lithosols soil. The greatest change from historic conditions has been a reduction of bunchgrass cover in the understory and an increase in sagebrush cover. Soil compaction is also a significant factor in heavily grazed lands, and affects water percolation, runoff, and soil nutrient content. It is difficult to find stands of shrub-steppe that are still in relatively natural condition (USFWS 2012). A long history of fire, grazing, and invasion by exotic vegetation has altered the composition of the plant community within much of the extant shrub-steppe in the region (Quigley and Arbelbide 1997; Knick 1999). Further discussion of these issues follows:

Fire—Since Euro-American settlement in the shrub-steppe areas of Eastern Washington in the second half of the 19th Century, the fire regime across much of this habitat has been drastically altered. The historic fire return interval in shrub-steppe was about 30-75 years, characterized by small, intense fires that removed fire-intolerant shrub overstory. These infrequent fires helped maintain both shrub and grassland communities (USFWS 2012).

The current fire return interval is often much shorter. The primary cause of the altered fire return interval is the introduction of cheatgrass and other invasive plant species. Native shrub-steppe plant communities are characterized by discontinuous bunchgrass, which limit the ability of fire to spread. Cheatgrass and other invasive species form a continuous vegetative layer that, when dry, provides fuel for large fires that can burn thousands of acres at much more frequent intervals. Cheatgrass also dries earlier, providing a longer fire season. This is significant in the sense that early season fires can cause high mortality of actively growing bunchgrass (USFWS 2012).

High intensity, frequent fires have severe ecological impacts on shrub-steppe habitats. Sagebrush and other shrubs do not tolerate a short-term fire regime, which can result in the loss of the shrub component over extensive areas after repeated fires. In addition, shrubs can burn with such intensity that they permanently destroy the understory plants. Recovery of sagebrush and other shrubs in a shrub-steppe community can take decades. This results in the loss of habitat on an essentially permanent basis for many wildlife species (USFWS 2012; Downs n.d.; Wambolt, et al. 2001; USGS 2013a).

Grazing—Grazing damage to three-tip sagebrush varies seasonally, but the perennial graminoids decrease and are eventually replaced by cheatgrass (*Bromus tectorum*) (an invasive non-native), threadleaf sedge *(Carex filifolia*), and/or rabbitbrush (*Chrysothamnus nauseosus*). Most native grasses and forbs are poorly adapted to year-round, heavy grazing and trampling by livestock. Intense grazing eventually leads to replacement of the bunchgrasses with cheatgrass, small fescue (*Vulpia microstachys*), sixweeks fescue (*V. octofiora*), and woolly plantain (*Plantago patagonica*).

Invasive Plant Species—Several knapweeds, including diffuse knapweed (*Centaurea diffusa*) and Russian knapweed (*Centaurea repens*) have spread in recent years, threatening to replace other exotics as the chief increaser after grazing (Roche and Roche 1988; 1991). Dalmatian toadflax (*Linaria dalmatica*) has also become increasingly widespread. MSGCP BMPs are designed to manage grazing in a way that balances utilization with rest and recovery periods for the benefit of native species. In addition to uncontrolled grazing, introduced annuals such as those mentioned above have also been introduced as a result of past management practices and importation of species on wheels and vehicle undercarriages (Thompson and Ressler 1988; USBLM 2005).

Forest

Forested areas are limited to about 8,000 acres by the semi-arid climate of Douglas County, and are found mostly on the north slope of Badger Mountain. Forests consist of scattered stands of Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) on Badger Mountain and in Corbaley Canyon (Pacific Groundwater Group 2003; Beieler 1981).

Riparian

Riparian habitats occur along natural drainage corridors, the Columbia River, and other stream courses where soil and moisture conditions support the growth of trees and shrubs. Native riparian vegetation is characterized by a mosaic of shrubby thickets with patches of deciduous trees and grass/forb-dominated plant communities. A diversity of shrub and deciduous tree species occurred historically and still occur in some places. These include snowberry (S*ymphoricarpus albus*), wild rose (R*osa* spp.), black hawthorn (C*rataegus douglasii*), hackberry (*Celtis reticulate*), cow-parsnip (*Heracleum lanatum*), common chokecherry (*Prunus virginiana*), bittercherry (*Prunus emarginata*), mock orange (*Philadelpus lewisii*), red osier dogwood (*Cornus stolonifera*), water birch (*Betula occidentalis*), willow (*Salix* spp.), black cottonwood *(Populus trichocarpa*), and quaking aspen (*Populus tremuloides*). Succulent herbs in the groundcover layer include sticky geranium (*Geranium viscosissimum*), northern bedstraw (*Gallium boreale*), fescue (*Festuca* spp.), waterleaf (*Hydrophillum* spp.), and bracken fern (*Pteridium pteridophyta*). Conifers, including ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*), are widely scattered in eastern Washington at higher elevations that receive sufficient rainfall. Coniferous trees were likely more common historically than at present (Knutson and Neaf 1997).

Russian olive (*Elaeagnus angustifolia*) and black locust (*Robinia psuedoacacia*), both introduced tree species, can be found in riparian habitats in Douglas County. Russian olive and black locust were originally planted by settlers and natural resource managers for shade trees and wildlife cover. Reed canary grass (*Phalaris arundinacea*) is sometimes found in riparian areas as well. It is an invasive grass species that has replaced native riparian grasses along the banks of perennial streams and in wetland complexes. Small, intermittent streams and draws may naturally have little or no characteristic riparian vegetation in the semi-arid conditions encountered in Douglas County. Instead, these streams and draws may consist of largely upland plant species, including big sagebrush (*Artemisia tridentate*), bitterbrush (*Purshia tridentate*), rabbitbrush (*Chrysothamnus viscidiflorus*) and spiny hopsage (*Grayia spinosa*). The presence of woody and herbaceous vegetation assists in moderating stream temperatures, sedimentation loads, streamflow, and large woody debris recruitment and transport (Knutson and Neaf 1997).

Wetlands

The National Wetlands Inventory (NWI) in the northern portion of Douglas County shows over 20,000 acres of wetlands, approximately 3½ percent of the landscape (Figure 2-7). Most of the wetland types are lacustrine and palustrine wetlands, with only 6.85 acres mapped as riverine wetlands. The high number of acres mapped as lacustrine (open water), is likely due to the inclusion of the large Columbia River pools in the analysis. The lacustrine wetlands are systems over 20 acres (Cowardin et al. 1979), situated in a topographic depression or a dammed river channel, and usually lack trees, shrubs, and persistent emergents. The palustrine systems, which are more familiarly known as "marshes, bogs, swamps, and ponds" (Cowardin et al. 1979) are less than two meters deep, less than 20 acres and have more functional diversity than lacustrine systems. Important functions in these systems include removal of potential pollutants such as sediment, nitrogen, phosphorous, metals, toxic organic compounds; reducing downstream erosion and flooding; recharging groundwater and maintenance of base flows in streams; and food web support. Riverine systems include all wetlands and deepwater habitats contained within a channel, except those dominated by trees, shrubs, persistent emergents, mosses or lichens.

The NWI shows 8,857 acres of wetlands, approximately 1.21 percent of the landscape in the southern portion of Douglas County. NWI maps covering this part of the Plan Area also show large areas of open water lacustrine wetland habitat (6,876 acres), which include the Columbia River impoundments. With most of the wetlands classified as lacustrine and palustrine, and only 35 acres classified as riverine, the southern part of the Plan Area has a distribution of wetlands similar to the northern part. Basic wetland functions are also similar, but will vary on a site-by-site basis. There are no comprehensive studies in these watersheds showing wetland acreage or functions lost over time from natural and human causes.

Cliffs and Talus

Due to the geological history of the region, which includes numerous basalt lava flows, glaciation, and extensive ice-age flood events, there is much exposed basalt throughout the County. Extensive areas of cliffs and talus slopes are located in Moses Coulee, along the Columbia River, and along the eastern border of the county. More localized areas of cliffs and talus slopes are scattered throughout the Plan Area.

Despite the relatively small area classified as cliffs and talus slopes, this land type provides important habitat for a number of wildlife species, primarily due to the presence of caves and crevices. Caves and crevices in Douglas County provide roosting areas for the majority of species of bats found in Washington; fourteen of the fifteen species known to occur in Washington have been documented in Moses Coulee (Hays and Wiles 2013).

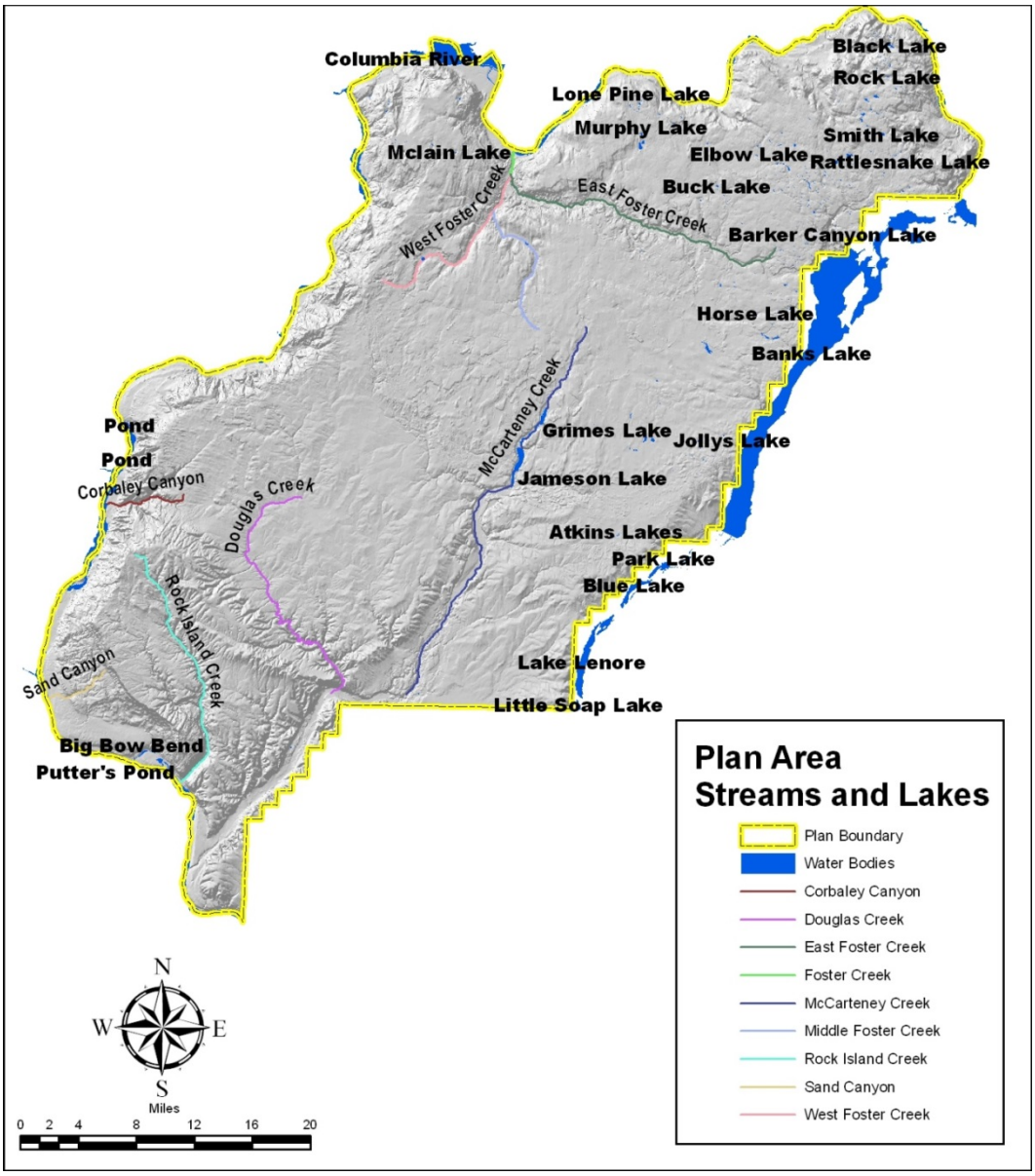

Figure 2-6: Streams and Lakes in and around Douglas County

Water: Lakes and Streams

The Columbia River winds its way 156 miles along the County's northern, western, and southern perimeter, draining two major watersheds—Foster Creek Water Resource Inventory Area 50 (WRIA 50) and Moses Coulee Inventory Area (WRIA 44) (Pacific Groundwater Group 2003). Major natural lakes in Douglas County include Jamison Lake (332 acres), Atkins Lake (149 surface area in acres, dry since 1999 due to lack of sufficient precipitation), and Grimes Lake (124 acres). Several smaller lakes (less than 100 acres) and seasonal "potholes" are scattered throughout the area. The lakes are sustained by groundwater and water levels can be indirectly related to water quantity in the streams. Man-made reservoirs are limited to the large impound-

ments behind the Columbia River hydroelectric dams including Rock Island, Entiat, Pateros, and Rufus Woods Lakes, which, respectively, are the impoundments created by Rock Island Dam, Rocky Reach Dam, Wells Dam, and Chief Joseph Dam (KCM 1995; Johnson 1974). Washington State Water Resource Inventory Areas (WRIAs) 44 and 50 include most of Douglas County and parts of Grant and Okanogan Counties. The watersheds contain eight creeks of significant size: Foster Creek, Corbaley/Pine Canyon Creek, Sand Canyon Creek, Rock Island Creek, Coyote Creek, McCartney Creek, Rattlesnake Creek, and Douglas Creek/Moses Coulee. In addition, there are numerous smaller creeks and lakes within the WRIAs.

Pursuant to the Washington Watershed Management Act (RCW 90.82) of 1998, the development of a watershed management plan for WRIAs 44 and 50 was initiated in 1999. This was a collaborative effort involving a broad range of Federal, State, and local governments, agricultural interests, local citizens, and others. The final report, *Watershed Management Plan-Moses Coulee and Foster Creek Watersheds-WRIA 44 and 50*, was released in September 2004 (FCCD 2004). The entire area of these two watersheds located in Douglas County is included in the MSGCP area.

Conservation Reserve Program Lands (CRP)

The first cultivated fields enrolled in CRP in Douglas County were seeded primarily with crested wheatgrass and other introduced grasses. Native grasses and forbs were seldom used. In some cases, non-native grasses were used because there were shortages of seed from native species and they were less expensive. Native grasses and forbs were more commonly used during sign-ups in the late 1990s. Currently, CRP lands are seeded with a vegetative cover of native forbes, grasses, and shrubs. A few varieties of forbs that do not threaten to become weeds are mixed with the grasses in many CRP fields (Thompson and Ressler 1988).

At one time Douglas County possessed an acreage limitation waiver to maintain 33 percent rather than the usual 25 percent of total cropland in general CRP. Douglas County no longer possesses the waiver; however, the Farm Service Agency offered extensions of some CRP contracts ranging from two to ten years to better serve the farming community. These extensions changed the expected quantity and duration of CRP contracts in the Plan Area. The impact from loss of CRP acres is also limited because the SAFE acres, although considered CRP acres, are not subject to the 25 percent county limit. A waiver is not possible for "General CRP," but SAFE is considered "Continuous CRP" (Michele Ruud, personal communication, 2013).

Over 33 percent of total cropland acres in Douglas County were enrolled in the CRP as of 30 June 2013. A total of 182,072 acres out of approximately 560,000 eligible acres had been enrolled in the program. (This calculation of total cropland is based on the Farm Service Agency records for active farm tracts and does not include all cropland in the County). CRP sign-up is distributed roughly evenly throughout WRIAs 44 and 50 (Sherry Ramen, personal communication, 2013). There has been a shift in the purpose of CRP from primarily production

in 1986 to providing wind/water erosion control and wildlife habitat benefits (Michele Ruud, personal communication, 2013).

CRP lands were initially classified into a single habitat type for the MSGCP analysis. It was determined after further review that they must be typed according to their current observable land-cover status. This action removed the CRP classification for the land-cover breakdown and the acreage is now distributed among the appropriate 23 land-cover categories. To better reflect the habitat contributions that individual CRP fields make to the MSGCP, a ranking process was completed that utilized the cumulative HSI-acre values and proximity to native shrub-steppe. This model (Appendix G) will assist the FCCD and the Implementation and Monitoring Committee (IM Committee) as they allocate program resources to areas where they will have the greatest effect.

Agricultural Lands

Currently, privately owned agricultural land comprises 878,867 acres of total land in the County with production split as follows: 60 percent dryland agriculture, 37 percent rangeland, and 3 percent irrigated agriculture (USDA 2007).

Land Cover Types

Habitat types in the Plan Area generally contain multiple plant communities and land covers. FCCD determined that while many of the covered species use common habitats, certain species utilized different plant communities within the same habitat for different reasons, whether for food, shelter, or breeding activities. Thus, it became apparent that specific plant communities had different levels of importance to many of the covered species.

The nine main habitat types described in previous paragraphs have been further classified into 23 distinct land cover types. These land cover types are a result of the remote sensing and image analysis process described in (Appendix G). These land-cover types describe the dominant plant communities that are directly observable:

1. Urban
2. Irrigated Forage Crops
3. Irrigated Orchard
4. Dryland Agriculture
5. Riparian, Large Trees and Shrubs
6. Three-tip Sagebrush, Moderate Cover
7. Three-tip Sagebrush, Dense Cover
8. Three-tip Sagebrush, Light Cover
9. Grasslands, Bare/Three-tip Sagebrush
10. Big Sagebrush, Moderate Cover
11. Big Sagebrush, Dense Cover
12. Stiff Sagebrush/Grasslands
13. Grasslands, Bare/Stiff Sagebrush
14. Bitterbrush, Moderate Cover
15. Bitterbrush, Dense Cover
16. Non-Shrub-steppe, Moderate Brush Cover
17. Non-Shrub-steppe, Dense Brush Cover
18. Non-Shrub-steppe, Light Brush Cover
19. Non-Shrub-steppe, Grasslands/Bare Ground
20. Grasslands, Burned 2005
21. Conifer Forest
22. Rock and Rubble, Talus

FCCD utilized Landsat 7 multi-spectral scenes of the Plan Area in an effort to better stratify the land cover typing. Two scenes (April and July 2005) were processed using Leica Image processing software to identify distinct spectral signatures between the land cover types.

These signatures were grouped into classifications with similar ranges to reduce their numbers. NRCS Potential Natural Communities (PNCs) for the Plan Area were identified and associated with the refined groups to finalize the classifications. The NRCS PNCs combine dominant plant community information along with soil type, slope, and aspect. This step was essential given the need to separate the differing species of sagebrush in the Plan area.

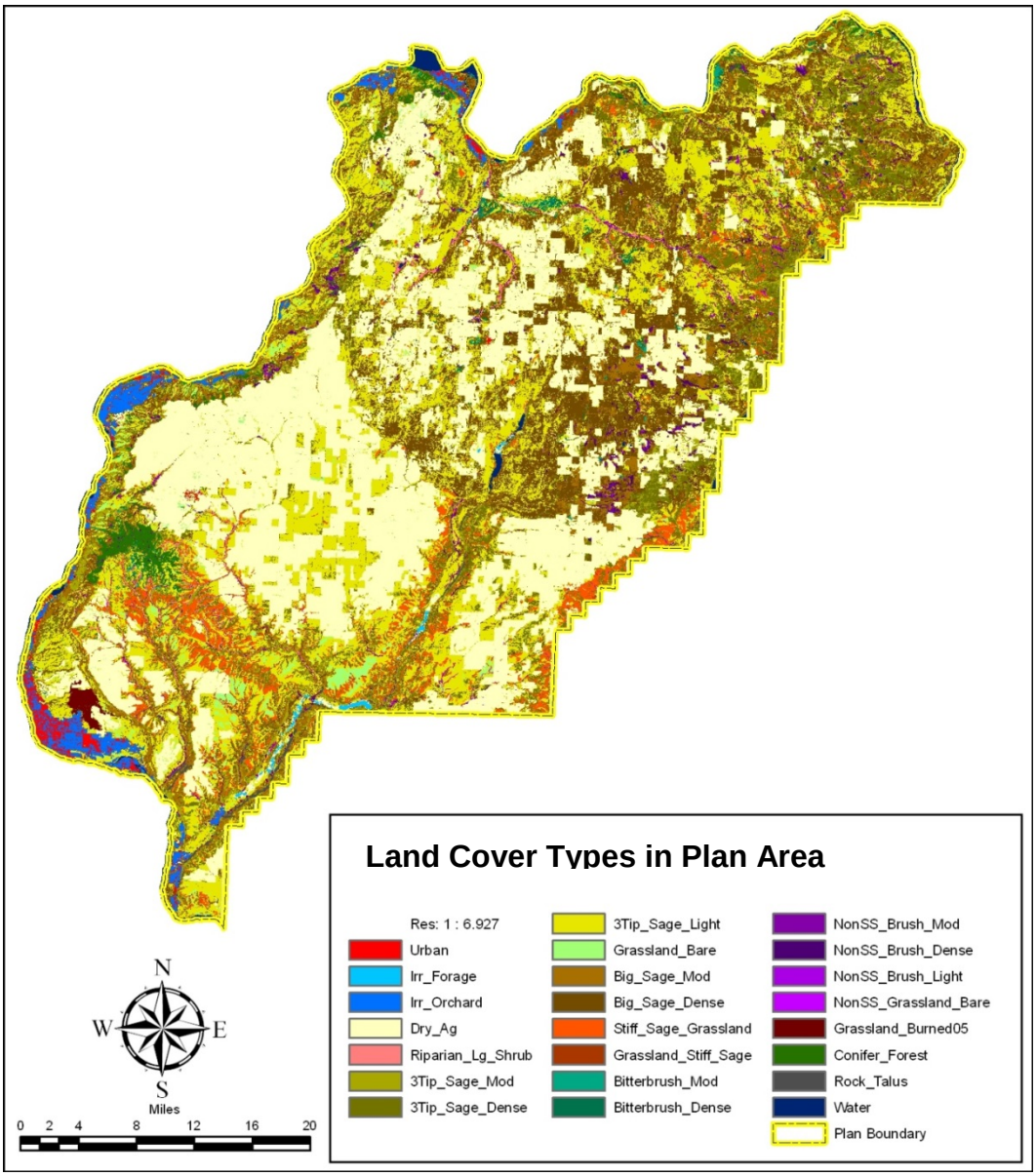

Figure 2-7: Land Cover Types in Plan Area

The land-cover types are summarized below, with the legend designation in Figure 2-8 in parenthesis.

Table 2-1: Plan Area Land Cover Types (as of 2005 image analysis)

Type	Designation	Description
1	Urban (Urban) 9,504 acres – 0.80%	Human construction and non-agricultural influence. While small pockets of vegetation do appear in the analysis (lawns, parks, landscaping) these pockets were dissolved into the larger land cover type.
2	Irrigated Forage Crops (Irr_Forage) 1,645 acres – 0.14%	Irrigated agricultural production, but not typically permanent crops such as tree fruits. This land cover type is dominated by the production of alfalfa and grass hay, corn, potatoes, and legumes. While this is classified as an irrigated land type, the CPs recommended for this specific land cover type differ from the Irrigated Orchard land cover type.
3	Irrigated Orchards (Irr_Orchard) 20,676 acres – 1.75%	Permanent irrigated crops such as tree fruits (apples, pears, cherries, and stone fruits), grape vines, and berries. These crops were differentiated from other irrigated forage crops due to their more-unique CP requirements.
4	Dryland Agriculture (Dry_Ag) 352, 038 acres – 29.76%	Dryland crop production. In the Plan Area, wheat production on a two-year wheat/fallow rotation dominates the land cover type. Smaller amounts of canola, rapeseed, and dryland legumes are raised. In some areas, yearly cropping rotations have been used. These crops share similar CPs.
5	Riparian, Large Trees and Shrubs (Riparian_Lg_Shrub) 5,459 acres – 0.46%	Riparian plant communities and trees associated with these areas. This land cover type is typically found along surface water streams and is strip-like in nature. Riparian areas are also found in draws with intermittent surface water.
6	Three-Tip Sagebrush, Moderate Cover (3Tip_Sage_Mod) 35,189 acres – 2.97%	Shrub-steppe plant communities with three-tip sage (*Artemisia tripartita*) as the primary shrub component. Moderate cover describes a range of sagebrush cover between ten and 40 percent.
7	Three-Tip Sagebrush, Dense Cover (3Tip_Sage_Dense) 103,909 acres – 8.78%	Shrub-steppe plant communities with three-tip sage (*Artemisia tripartita*) as the primary shrub component. Dense cover describes a range of sagebrush cover greater than 40 percent.

Type	Designation	Description
8	Three-Tip Sagebrush, Light Cover (3Tip_Sage_Light) 286,042 acres – 24.18%	Shrub-steppe plant communities with three-tip sage (*Artemisia tripartita*) as the primary shrub component. Light cover describes a range of sagebrush cover less than ten percent.
9	Grasslands, Bare/Three-Tip Sagebrush (Grassland_Bare) 16,719 acres – 1.41%	Shrub-steppe plant communities with less than one percent shrub cover. In the Plan Area, grasslands are typically bunch grass plant communities with considerable bare ground between them. This land cover type includes a range of shrub-less grasslands and their barren interstitial areas found within potential three-tip sage areas.
10	Big Sagebrush, Moderate Cover (Big_Sage_Mod) 58,097 acres – 4.91%	Shrub-steppe plant communities with big sage (*Artemisia tridentata*) as the primary shrub component. Moderate cover describes a range of sagebrush cover between ten and 40 percent.
11	Big Sagebrush, Dense Cover (Big_Sage_Dense) 178,808 acres – 15.12%	Shrub-steppe plant communities with big sage (*Artemisia tridentata*) as the primary shrub component. Dense cover describes a range of sagebrush cover greater than 40 percent.
12	Stiff Sagebrush, Grasslands (Stiff_Sage_Grassland) 44,937 acres – 3.80%	Shrub-steppe plant communities with stiff sage (*Artemisia rigida*) as the primary shrub component. This land cover type covers a range of sagebrush cover less than ten percent.
13	Grasslands, Bare/Stiff Sagebrush (Grassland_Stiff_Sage) 1,717 acres – 0.15%	Shrub-steppe plant communities with less than one percent shrub cover. In the Plan Area, grasslands are typically bunch grass plant communities with considerable bare ground between them. This land cover type includes a range of shrub-less grasslands and their barren interstitial areas found within potential stiff sage areas.
14	Bitterbrush, Moderate Cover (Bitterbrush_Mod) 3,023 acres – 0.26%	Shrub-steppe plant communities with bitterbrush (*Purshia tridentata*) as the primary shrub component. Moderate cover describes a range of bitterbrush cover between ten and 40 percent.
15	Bitterbrush, Dense Cover (Bitterbrush_Dense) 5,269 acres – 0.45%	Shrub-steppe plant communities with bitterbrush (*Purshia tridentata*) as the primary shrub component. Dense cover describes a range of sagebrush cover greater than 40 percent.

Type	Designation	Description
16	Non Shrub-steppe, Moderate Brush Cover (NonSS_Brush_Mod) 4,981 acres – 0.42%	Non-shrub-steppe plant communities with brush as the primary shrub component. Moderate cover describes a range of brush cover between ten and 40 percent.
17	Non Shrub-steppe, Dense Brush Cover (NonSS_Brush_Dense) 10,231 acres – 0.86%	Non-shrub-steppe plant communities with brush as the primary shrub component. Dense cover describes a range of brush cover greater than 40 percent.
18	Non Shrub-steppe, Light Brush Cover (NonSS_Brush_Light) 7,693 acres – 0.65%	Non-shrub-steppe plant communities with brush as the primary shrub component. Light cover describes a range of brush cover less than ten percent.
19	Non Shrub-steppe, Grasslands/Bare Ground (NonSS_Grassland_Bare) 320 acres – 0.03%	Non-shrub-steppe plant communities but with less than one percent shrub cover. In the Plan Area, grasslands are typically bunch-grass plant communities with considerable bare ground between them. This land cover type covers a range of shrub-less grasslands and their barren interstitial areas found within potential non-shrub-steppe areas.
20	Grasslands, Burned 2005 (Grassland_Burned05) 2,541 – 0.21%	Recently burned areas (within 12 months of imaging). They may have originally been classified as a shrub-steppe, non-shrub-steppe, riparian, or coniferous forest, but have been converted due to wildfires. The typical progression of plant community restoration and re-growth begins with bunch grass plant communities.
21	Conifer Forest (Conifer_Forest) 10,933 acres – 0.92%	Scattered stands of Douglas fir and ponderosa pine. Some isolated trees or small stands of trees are present within other land-cover types but were not classified as conifer forest if their stand size was below one quarter of an acre.
22	Rock and Rubble, Talus (Rock_Talus) 3,497 acres – 0.30%	Few or no plant communities and exposed basalt beds.
23	Water (Water) 20,208 acres – 1.66%	Visible surface water along with established identifiable surface water lakes that may diminish or disappear at times due to varying precipitation conditions.
Total	1,183,414 acres – 100%	

Douglas County Multiple Species General Conservation Plan

Chapter 3: Multiple Species General Conservation Plan

Chapter Overview

Chapter 3 defines the MSGCP and the actions to be taken over the 50-year permit period. Effects of the MSGCP's actions on Covered Species and their habitats, as well as potential incidental take, are estimated for present conditions as well as approximately 10 and 50 years into the future. Measures to minimize and mitigate the effects are described.

Land Types within the Plan Area

Douglas County was stratified into five general land-use types for MSGCP development and reference throughout this document. These types include:

1. Dryland Agriculture
2. Irrigated Agriculture
3. Rangeland
4. Habitat Conservation Areas (HCAs)
5. Non-MSGCP Land

Dryland Agriculture and Irrigated Agriculture consist of lands that are agriculturally cultivated or where irrigated cropland management activities occur, respectively. It is anticipated that Covered Activities will be most prevalent on these lands and BMPs will provide conservation benefits. These lands also contain patches of native habitat utilized by Covered Species (fragmented areas of shrub-steppe habitat) and include all CRP/SAFE lands within the County.

Rangeland consists of lands in which management is most often directed towards providing grazing for livestock and generally includes shrub-steppe habitat types and wetlands. These areas are either privately owned or State land leased to ranchers for grazing. Rangelands provide one of the largest opportunities for improving habitat and thereby conserving Covered Species in the Douglas County Plan Area.

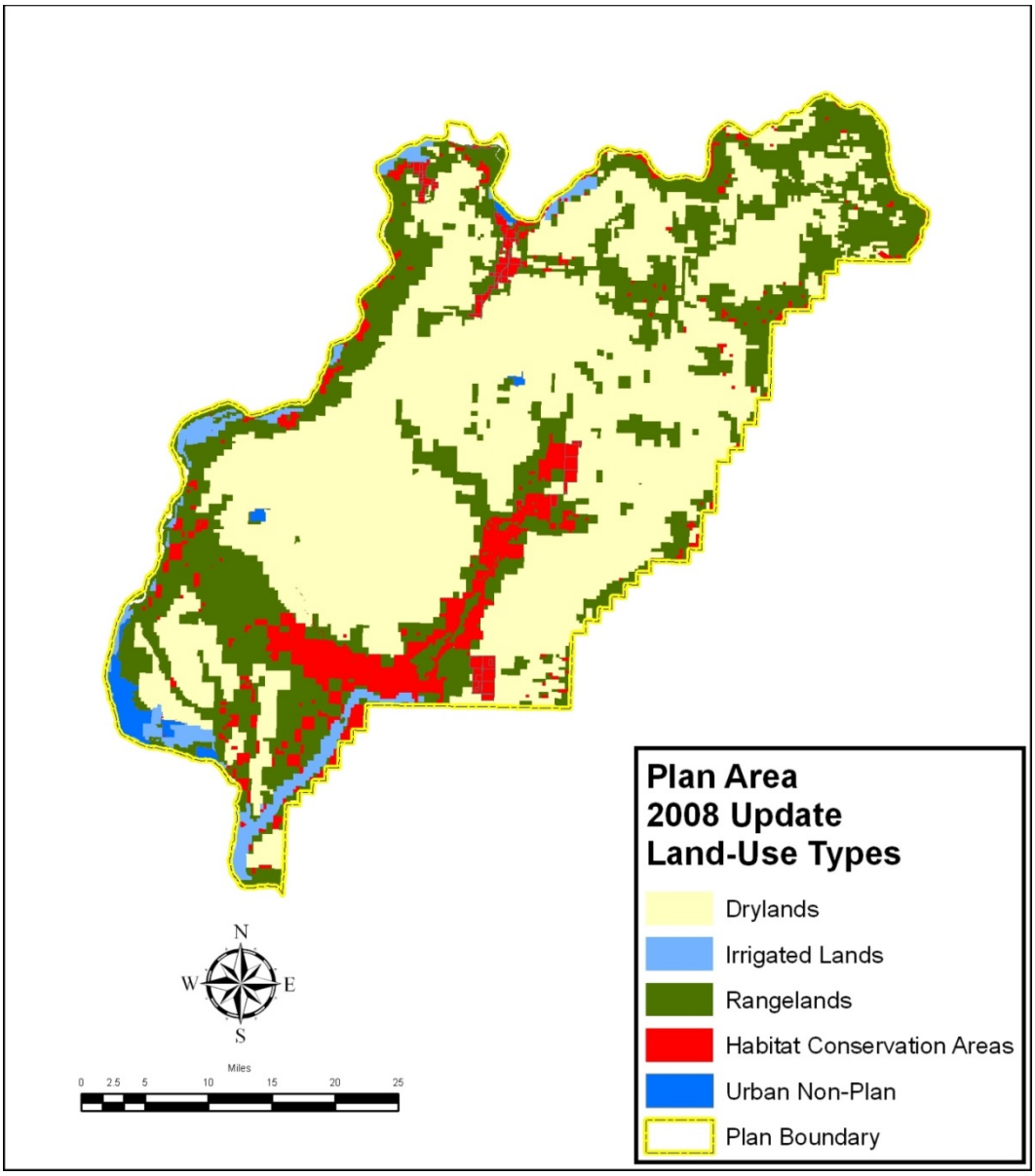

Figure 3-1: Plan Area Land-Use Types in Douglas County Used for MSGCP Development

Habitat Conservation Areas (HCAs) in Douglas County include multiple-use areas or wildlife-emphasis areas owned and/or managed by Federal agencies (mostly BLM), WDFW, and TNC. The HCAs occur in scattered parcels and larger blocks within Douglas County (Figure 3-2) and are generally managed to reduce or eliminate potential threats to biological resources. In some instances, compatible grazing or other agricultural activities may occur. While these lands will not be covered by an ESA Section 10 permit, they will be an integral part of this MSGCP as they provide blocks of habitat managed for the benefit of native wildlife. The MSGCP expects that HCAs will continue to be managed in this way, and the basis for this expectation is discussed in the following sections. If this expectation is not met, this qualifies as a "Changed Circumstance." Changed Circumstances are discussed in detail in Chapter 4.

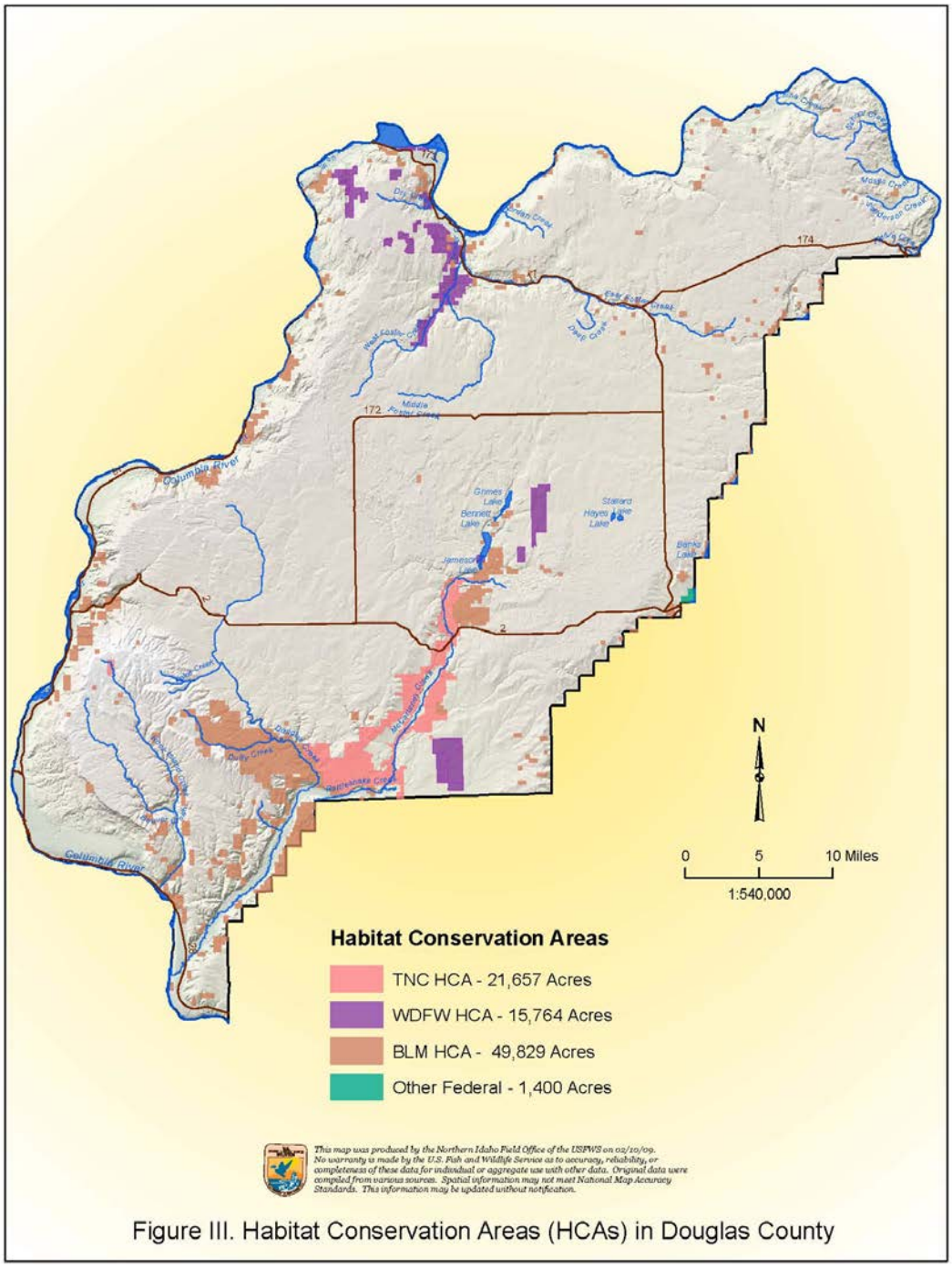

Figure 3-2: Habitat Conservation Areas (HCAs) in Douglas County

Non-MSGCP Lands consist of all non-agricultural lands, including urban lands within the cities of East Wenatchee, Rock Island, Waterville, Mansfield, and Bridgeport. These lands are not eligible for participation within the MSGCP and are considered non-project lands.

BLM Lands and Management in Douglas County

The BLM manages its lands in eastern Washington under the Spokane Resource Management Plan (RMP) (USBLM 1985; 1992). The RMP provides a comprehensive framework for managing and allocating public land and resources in the Spokane District for a decade or longer. It serves as the master plan, providing framework for site-specific decisions regarding conditional or prohibited uses and activities in some sites. It defines the intensity of management of various resources, the development of activity plans, such as grazing allotment management plans and habitat management plans, and the issuance of rights-of-way, leases, or permits. The RMP was developed under Federal Land Policy Management Act (FLPMA) requirements and used an interdisciplinary planning process to identify and resolve new issues and to apply principles of multiple use and sustained yield. The BLM initiated the development of a new RMP in 2010; no completion date has been announced, but the new RMP is not expected prior to 2015. Once complete, the new RMP will guide management of BLM lands for 10-20 years.

In 1992, an amended RMP merged two management areas in Douglas County (previously Jameson Lake management area and Douglas Creek management area) into the Moses Coulee Management Unit. Land exchanges have occurred to gain additional public land within the Moses Coulee Management Unit (USBLM 2008). The BLM lands in Douglas County (close to 54,000 acres) are multiple-use areas and are managed to include an emphasis on wildlife habitat, grazing, and recreation. BLM's policies and regulations require consideration of listed, sensitive, proposed, and candidate species and other game and nongame species. The BLM implements measures to minimize effects to species (e.g., seasonal restrictions at grouse leks), and improve habitats (e.g., ensuring sufficient forage and cover and improving riparian habitats). It is BLM policy to maintain viable populations of proposed or sensitive species. BLM also manages an Area of Critical Environmental Concern in Douglas County, which includes 200 acres near Brewster to protect a bald eagle winter roost.

WDFW Lands and Management in Douglas County

WDFW manages over 16,000 acres in Douglas County as units of two wildlife management areas: Wells Wildlife Area and Sagebrush Flat Wildlife Area. Each wildlife management area is composed of several land parcels, and WDFW has developed management plans for the two areas.

Wells Wildlife Area

The Wells Wildlife Area was created as part of the Wildlife Mitigation Agreement between WDFW and Douglas County PUD in 1974. The Wildlife Management Agreement is a component of the Wells Hydroelectric Project Federal Energy Regulatory Commission License No 2149. Currently, there are three units of the Wells Wildlife Area located in Douglas County totaling 3,408 acres: Central Ferry Canyon–1,908 acres, West Foster Creek–1,050 acres, and Bridgeport Bar–450 acres. All three units are located in the northwest portion of the county (WDFW 2006a)

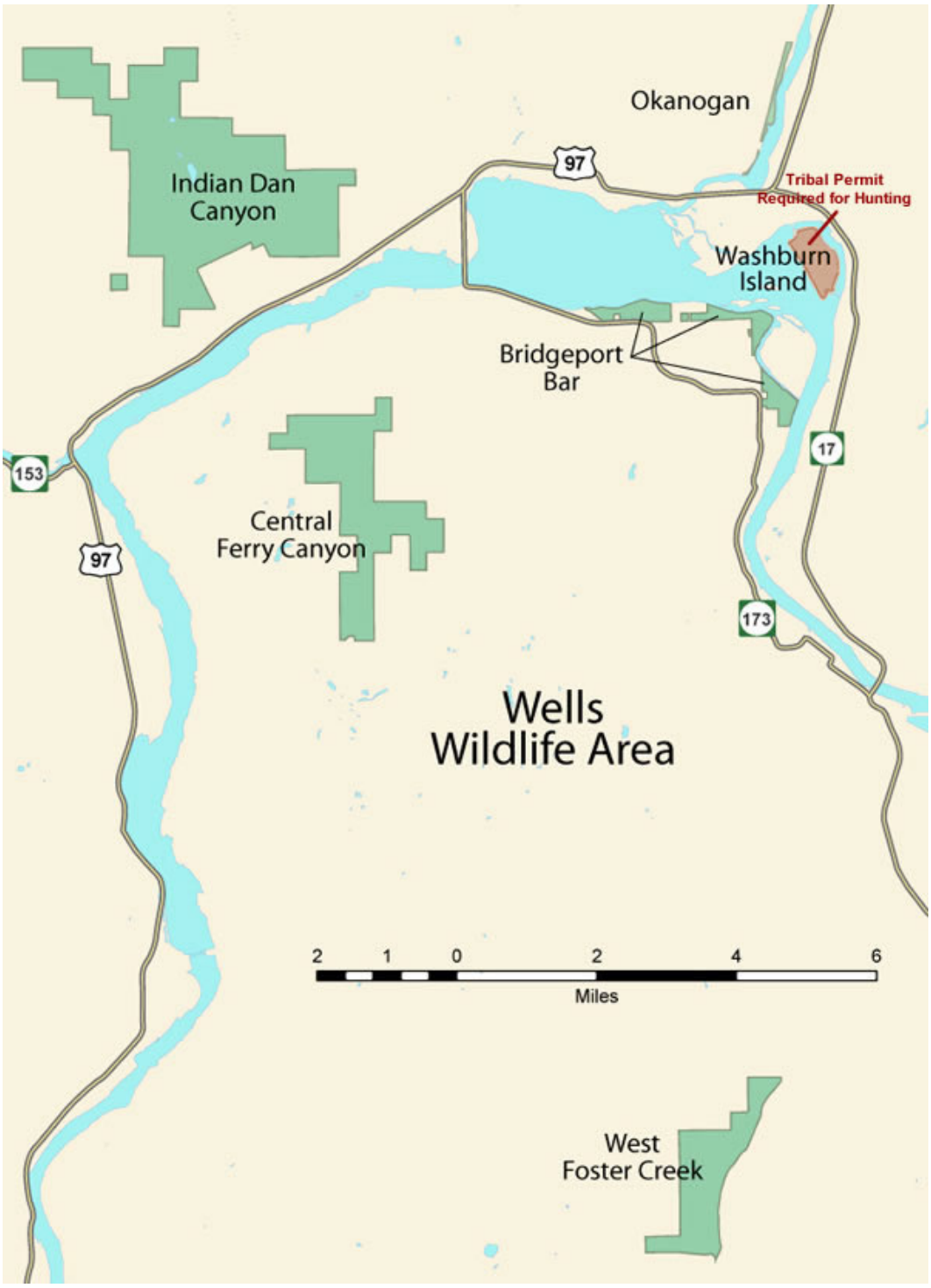

Figure 3-3: Wells Wildlife Area Map (credit: WDFW)

WDFW developed the *Wells Wildlife Area Management Plan* in 2006. This plan was updated in 2007, 2008, 2009, 2010, and 2012.

The majority of habitat types on the Wells Wildlife Area are shrub-steppe and steppe. Riparian habitat is scattered throughout the Wildlife Area along creek bottoms, lakes, and springs. Habitat types have been degraded by past agricultural activities and grazing (WDFW 2006a). Habitat on the Wells Wildlife Area is considered critical to WDFW's goal of maintaining and increasing the population of Columbian sharp-tailed grouse, greater sage-grouse, and Columbia Basin pygmy rabbit, as well as other species dependent on these habitats (WDFW 2006a).

Small, localized populations of Columbian sharp-tailed grouse occur on the West Foster Creek and Central Ferry Canyon units (WDFW 2006a). In an effort to increase the numbers of this species, Columbian sharp-tailed grouse were captured in Utah, Idaho, and British Columbia and released near the WFC unit in 2006 (WDFW 2006b). In addition, greater sage-grouse have been observed on the West Foster Creek Unit (WDFW 2006a).

The Wells Wildlife Area Management Plan lists nine management objectives (WDFW 2006a):

1. Manage for upland game.
2. Manage for waterfowl.
3. Manage for big game.
4. Improve and maintain fish populations.
5. Manage for species diversity.
6. Protect and restore riparian habitat.
7. Protect and restore shrub-steppe habitat.
8. Protect and restore wetland and meadow habitat.
9. Protect and manage other species including Threatened and Endangered Species.

Sagebrush Flat Wildlife Area

The Sagebrush Flat Wildlife Area was approved as a wildlife mitigation project in 1992. It was incorporated in 2002 as part of Northwest Conservation and Power Council's Columbia Basin Fish and Wildlife Program as partial mitigation for adverse impacts caused by the construction and operation of Chief Joseph and Grand Coulee dams. Since 1991, ten separate purchases have occurred that form the current Wildlife Area, with the most recent purchase in 2002. The Bonneville Power Administration continues to provide O&M funding for the Sagebrush Flat Wildlife Area (WDFW 2006c).

The Sagebrush Flat Wildlife Area consists of four units, totaling 12,718 acres, located in north and east-central Douglas County: Bridgeport–6,452 acres, Sagebrush Flat–3,740 acres, Chester Butte–2,206 acres, and Dormaier–320 acres. WDFW developed the *Sagebrush Flat Wildlife Area Management Plan* in 2006, and this plan has been updated in 2007, 2008, 2009, 2010, and 2012.

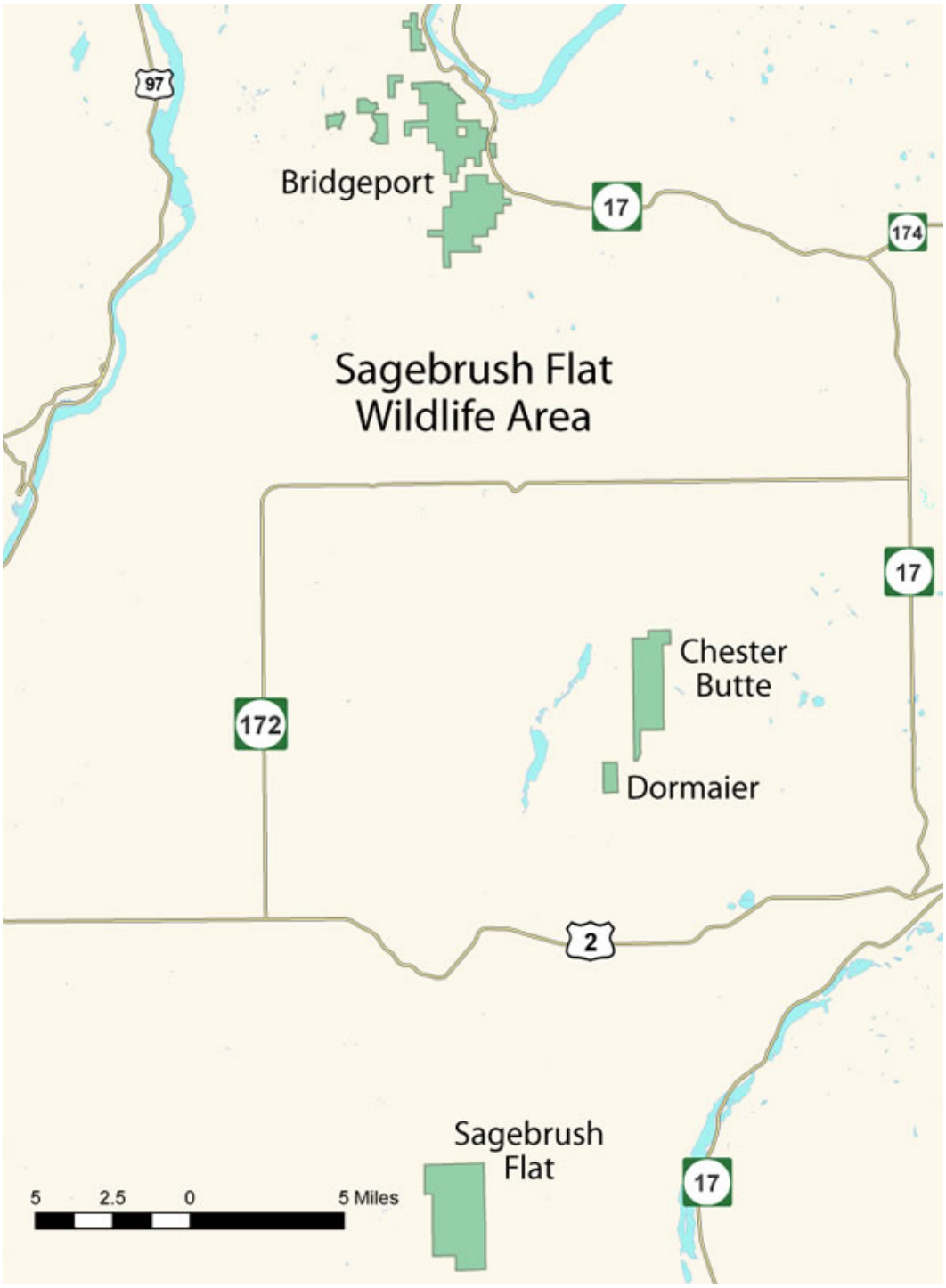

Figure 3-4: Sagebrush Flat Wildlife Area (credit: WDFW)

The predominant vegetation type on the Sagebrush Flat Wildlife Area is big sagebrush (*Artemisia tridentate*) and bluebunch wheatgrass (*Pseudoroegneria spicata*), although each unit has different habitat characteristics. The Bridgeport Unit features a 6.4 mile-long stream corridor, numerous springs, and north facing draws. These areas support a variety of shrubs and

trees, including serviceberry (*Amelanchier alnifolia*), rose (*Rosa ssp.*), chokecherry (*Prunus virginiana*), hawthorn (*Crataegus douglasii*), black cottonwood (*Populus trichocarpa*), quaking aspen (*Populus treumloides*), and water birch (*Betula occidentalis*). These species form critical riparian habitat that provides food and shelter for Columbian sharp-tailed grouse during the winter (WDFW 2006c).

The Chester Unit provides seasonal ponds and meadows that provide habitat for a variety of wildlife species, including mule deer and migrating waterfowl (WDFW 2006c).

The Sagebrush Flat Unit contains one of the largest expanses of deep-soil sagebrush habitat in the region. The vegetation and soil characteristics of this Unit make it the focal point for restoration of Columbia Basin pygmy rabbits (WDFW 2006c). Recovery efforts related to the pygmy rabbit at Sagebrush Flat are described in more detail in Chapter 1, beginning on page 5. The *Sagebrush Flat Wildlife Area Management Plan* lists eight management objectives (WDFW 2006c):

1. Protect and restore shrub-steppe habitat.
2. Manage for species diversity.
3. Protect and restore riparian habitat.
4. Manage for upland birds.
5. Maintain big game populations.
6. Improve and maintain fish populations.
7. Waterfowl and shorebird management.
8. Protect and manage other species.

Additional WDFW goals and objectives are included in the *WDFW 2011-2017 Strategic Plan* (WDFW 2010). Goals and objectives from the Plan that are relevant to the Wells Wildlife and Sagebrush Flat Wildlife areas are listed below:

Goal I: Healthy and diverse fish and wildlife populations and habitats

- Objective: protect, restore and enhance fish and wildlife populations and their habitats.
- Objective: ensure WDFW activities, programs, facilities and lands are consistent with local, State, and Federal regulations that protect and recover fish, wildlife, and their habitats.

Goal II: Sustainable fish and wildlife-related opportunities

- Objective: provide sustainable fish- and wildlife-related recreational and commercial opportunities compatible with maintaining healthy fish and wildlife populations and habitats.
- Objective: improve the economic well-being of Washington by providing diverse, high quality recreational and commercial opportunities.

Goal III: Operational Excellence and Professional Service

- Objective: provide sound operational management of WDFW lands, facilities, and access sites.

The WDFW is also in the process of developing a Habitat Conservation Plan (HCP) for activities on State-owned and managed Wildlife Areas, including the Sagebrush Flat Wildlife Area and the Wells Wildlife Area. The HCP will be a long-term management plan for the conservation and protection of species. The goals of the Wildlife Areas HCP are to provide ESA assurances for management, operational, and recreational activities occurring on State Wildlife Areas and to contribute to the conservation and recovery of ESA listed species and their habitats. The Wildlife Areas HCP may change management of wildlife areas, but changes are likely to benefit listed species and species of concern. The HCP is expected to be completed by the end of 2014.

The Nature Conservancy Lands and Management in Douglas County

The Nature Conservancy (TNC) is a private, non-profit conservation organization committed to preserving the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. TNC manages almost 22,000 acres in Douglas County. TNC's Moses Coulee/Beezley Hills Preserve totals more than 30,000 acres of shrub-steppe and occupies land in both Douglas and Grant Counties. The Conservancy is taking the following actions to ensure the long-term conservation of this habitat and its resident species (TNC 2008):

> *"Partnering with public and private landowners to advance the long-term conservation of 400,000 acres of functional shrub-steppe by identifying lands that connect existing shrub-steppe and by evaluating strategies that improve management and support conservation on private lands.*
>
> *"Working with partners to restore riverbank and stream habitat that has been degraded or modified, ensuring the protection of the seeps, springs and small pools that are critical to life in this arid environment.*
>
> *"Collaborating with management and regulatory agencies, farmers and ranchers to ensure that appropriate habitat, knowledge, and management capacity are available to support viable populations of greater sage-grouse, Columbian sharp-tailed grouse, and pygmy rabbits.*
>
> *"Providing habitat for 14 of the 15 bat species reported in Washington; the Moses Coulee Preserve is known as the single most-important location for this key group of animals in the state. Working with partners, researchers, and volunteers to create an inventory and monitoring program to gain the knowledge needed to ensure that*

appropriate conditions exist and support the long-term conservation of Washington's bat species."

The Nature Conservancy's long term goals are to: "conserve a large, fully functional example of Washington's shrub-steppe ecosystem through the collaborative efforts of private and public landowners supported by the greater community; and to begin the healing process necessary for the long-term survival of one of Washington's most important and imperiled ecosystems."

The Nature Conservancy's past and present actions confirm their commitment to manage their lands in and around Moses Coulee in Douglas County for shrub-steppe, riparian, aquatic, and other natural habitats.

Applicant Process

The MSGCP will be a programmatic HCP. If the MSGCP is approved, individual Applicants will work voluntarily with the FCCD to develop Farm Plans as described in the steps below. During the period between the draft and final MSGCP, it became apparent that the term "Farm Plan" was causing confusion, because this term is typically used by the NRCS and has a very specific meaning. Therefore, we have clarified the language to include both the initial step of a "Farm Plan"~~s~~ including NRCS Conservation Practices, and the second step with the part of the plan including the additional measures for certain land uses and specific species in certain situations based on habitats, species presence, or location now called a "GCP Site Plan". The Farm Plans/GCP Site Plans will be completed by Applicants, their appointees, or the FCCD, through the following steps:

1. Develop a Farm Plan using the Resource Management System (RMS) or similar process (Appendix H) and use Farm Plan Checklist (Appendix B). The Farm Plan will provide a description of on-going and planned agricultural activities for included lands, and will be very similar to a Natural Resource Conservation Service (NRCS) Conservation Plan.
2. Determine Conservation Practices to implement in the Farm Plan (Appendix E). Farm Plans and Conservation Practices should result in improved habitats, but many species need additional site-specific measures to minimize effects.
3. Determine additional measures to be included in a GCP Site Plan by land-use categories (Appendix E, page E-8) and species-specific measures (Appendix E, Table E-3), as appropriate based on activities, ranges, and habitats.
4. FCCD will review the Farm Plan/GCP Site Plan to ensure consistency with the MSGCP; the USFWS may also provide technical review and assistance.
5. After Farm Plans/GCP Site Plans are developed and approved by FCCD, the applicant will apply for a Section 10 Permit. The USFWS will notice the applications in the Federal Register, and request public comments during a 30-day public comment period. After consideration of public comments, and if consistency with the MSGCP and related

decision documents is assured, the USFWS will issue a Section 10 permit to the Applicants.

6. FCCD and the Applicant will monitor, per the AMMP, the HSI process and Appendix G.
7. Revise Farm Plans/GCP Site Plans and/or permits over time as expected in AMMP.

Farm Plans and Covered Activities

The MSGCP includes steps for Applicants to develop an outcome-based management plan (Farm Plan and GCP Site Plan) following review of the existing conditions and MSGCP expectations for each farm. "Outcome-based" means that the end goal is described, but the paths and techniques to achieve the goal are not specifically described (i.e., a results approach). This approach can be contrasted with a "prescriptive" management plan that identifies exactly how to reach the end goal. This philosophy allows MSGCP Applicants in Douglas County to minimize, mitigate, and monitor the impacts on Covered Species, while continuing agriculture activities and allowing for their creativity and ingenuity in reaching those goals for wildlife in the County.

The MSGCP Area is divided into three land-use categories—dryland agriculture, irrigated agriculture, and rangeland. When developing Farm Plans, applicants will start with an initial set of NRCS-based Conservation Practices appropriate for their land-use category. Depending on the site and habitats, they may add additional land-use and species-specific measures (Appendix E) in the GCP Site Plan.

A Farm Plan/GCP Site Plan will be completed by each Applicant, their appointee (such as a consultant), and/or the FCCD. If an appointee or consultant develops the plan, it would need to be reviewed by the FCCD for consistency with MSGCP expectations. The Service may provide technical assistance during development of the Farm Plan and/or GCP Site Plan. Figure 3-5 displays the review and processing steps for each Farm Plan/GCP Site Plan. The Farm Plan will provide a description of on-going and planned agricultural activities for included lands and must be consistent with the provisions and goals for minimizing and mitigating "take" of Covered Species as outlined in the MSGCP. The individual plans will be implemented by the Applicant/Permittee with assistance from the FCCD. The Farm Plans will be based on NRCS RMS, Plans, and the Nine-Step process (see Appendix H), with additional measures added to the GCP Site Plan as appropriate for certain land uses and certain Covered Species (see Appendix E).

Once the Applicant and FCCD reach agreement with respect to the Farm Plan/GCP Site Plan and the Applicant/Permittee applies for and receives a permit, the Permittee implements the best management practices as designed, including bearing the direct costs or costs of lost opportunities. This process lays out the BMPs to be implemented. However, as the FCCD implements an ongoing Adaptive Management and Monitoring Plan (AMMP), research and experience may indicate that particular BMPs are not achieving their desired results and the FCCD may recommend changes as needed. If the Service agrees that the changes are consistent with the original permit, then the Permittee may proceed with the revised Farm Plan/GCP Site

Plan. Otherwise, a permit modification may be necessary. Failure to properly implement the best management practices as mutually agreed to would result in the USFWS revoking any or all Permittees' incidental take permits, unless corrective actions have been implemented. The FCCD will continue to seek incentives that encourage additional conservation practices. All Farm Plans/GCP Site Plans for future Permittees will contain the appropriate BMPs as modified through the AMMP.

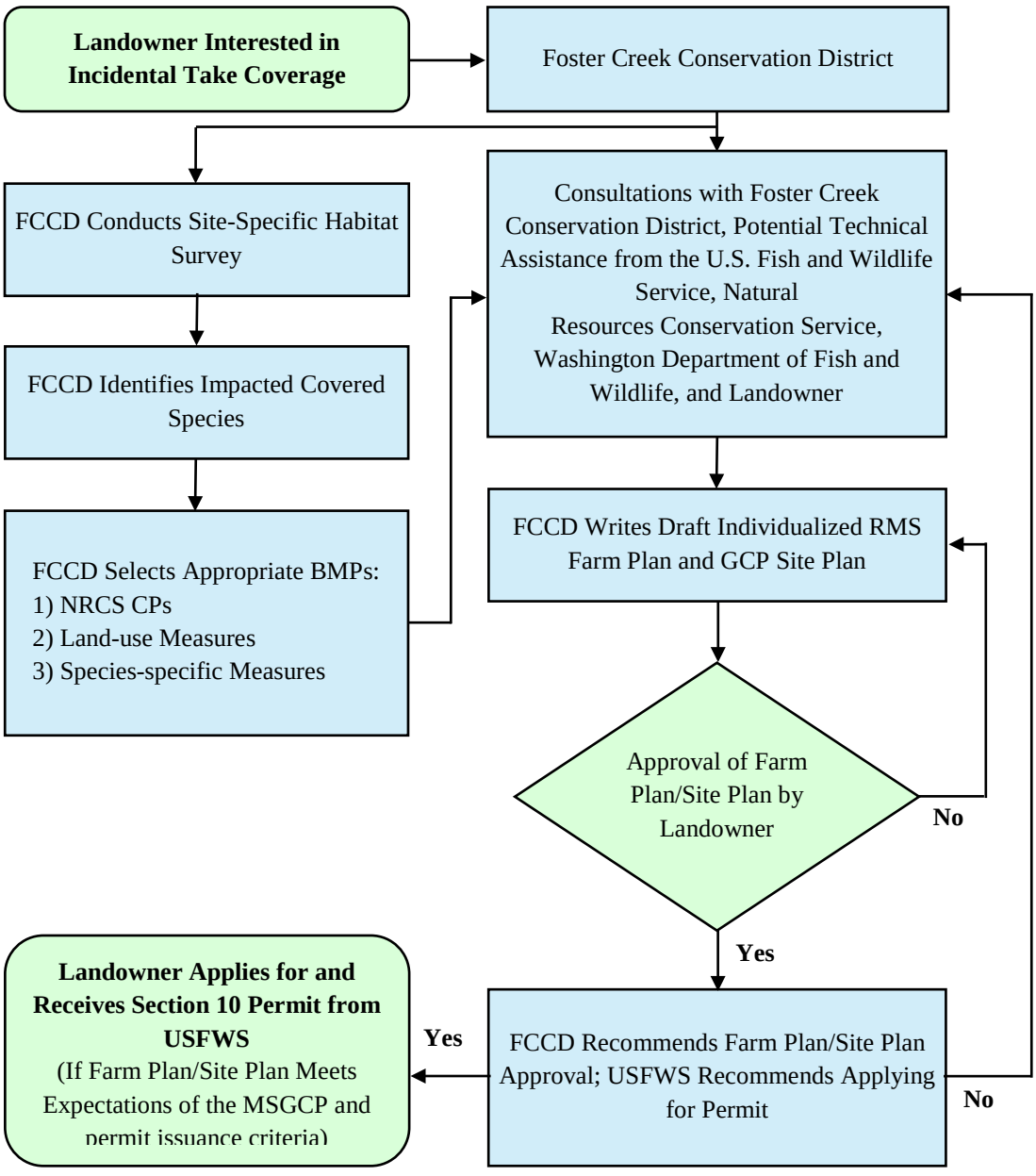

Figure 3-5: Farm Plan and GCP Site Plan Development Flowchart

Best Management Practices

The term "Best Management Practices," or BMPs, is a general reference to all potential minimization or mitigations measures, including Conservation Practices, additional land-use measures, and additional species-specific measures. Figure 3-5 illustrates the process used to develop Best Management Practices for individual Farm Plans and GCP Site Plans. Through the displayed process, Covered Activities are clarified, and impacts to the Covered Species are identified and quantified. The result is an individualized Farm Plan and GCP Site Plan for each Applicant for their specific agricultural operation.

The Planning Team reviewed the three types of covered agriculture land-uses, developed species-specific issues for each land-use (see more detail in Appendix C), and used the issues to develop management strategies for the land-uses, as described below. Those strategies were used as the Planning Team determined appropriate specific BMPs to be applied to the GCP Site Plans (Appendix E).

Dryland Agriculture

Cultivated drylands in Douglas County include lands planted in small grains, predominately winter and spring wheat, with some canola, rapeseed, or legumes.

General Management Strategies

1. Minimize disturbance to Covered Species habitat through temporal or spatial buffers.
2. Provide habitat for food and escape cover for covered species.
3. Reduce soil loss due to wind, water, and concentrated flow erosion.
4. Minimize non-target impacts of fertilizers, herbicides, and insecticides.
5. Protect remaining shrub-steppe habitat.

Irrigated Agriculture

Lands irrigated from the Columbia and Wenatchee Rivers are not included as covered lands under this MSGCP. Ground water- and surface water-irrigated areas exist in the Plan Area and are generally used for forage-crop production. These will be eligible for consideration as covered lands.

General Management Strategies

1. Maintain beneficial habitat conditions adjacent to and outside irrigated parcels.
2. Minimize disturbance to Covered Species habitat through temporal or spatial buffers.
3. Minimize the attractiveness of irrigated crops to covered species.
4. Minimize air-quality impacts from burning.
5. Minimize establishment and spread of undesirable invasive plants.
6. Encourage maximum benefit of water use.
7. Minimize pest-control impacts to non-target species.

8. Reduce negative impacts of chemical spray drift on non-target species.
9. Minimize lead and arsenic exposure when re-planting in certain locations (i.e., old orchards).

Rangeland

Rangeland is a general term for areas that do not generally support trees, but do support grass, forbs, and shrubs individually or in various combinations, depending on annual rainfall amount and timing. Shrub-steppe is a specific type of rangeland, usually dominated by one or several large shrubs and with an understory dominated by perennial grasses and forbs. Many areas meet shrub-steppe criteria, but because of disturbance now have somewhat different characteristics than the original and may or may not be currently classified as shrub-steppe. Nearly all dryland areas within the County that do not support trees as a general cover type and are not cultivated are rangeland. They are classified as rangeland regardless of the particular combination of grass, forbs, and/or shrubs species that exist in any given area.

General Management Strategies

1. Minimize disturbance to Covered Species habitat through temporal and spatial buffers.
2. Reduce habitat degradation through management of livestock use to sustain forage production and desired habitats.
3. No net loss of shrub-steppe rangeland habitat units.
4. Maintain and enhance riparian habitat to reach full site potential and function.
5. Minimize hunting impacts to non-target species and minimize recreation impacts through education and traffic minimization.
6. Decrease risk of wildfire and develop plans to minimize direct take and loss of habitat.
7. Minimize use and concentration of chemicals or nutrients under all aspects of livestock production.
8. Minimize negative impacts of fences.
9. Minimize exchange of parasites and disease between livestock and wildlife.
10. Maintain/improve habitat for Covered Species at appropriate seasons.

Effects to Habitat and Covered Species from Covered Activities

Early in the development of the MSGCP, the planning team met and discussed the impacts of Covered Activities on fish and wildlife species of concern in Douglas County. A review matrix was established identifying the relative non-numerical severity or impacts of various activities on each of the MSGCP Covered Species as shown below. Covered Activities which had no or minor effects were left off the following table, but are included in a similar but more detailed table in Appendix E.

Table 3-1: Potential Impacts Created by Covered Activities

Land Use	Activity Category	Covered Activity	Burrowing Mammals*	Shrub-steppe grouses*
Dryland Agriculture	Conversion	Mowing CRP/SAFE	Mortality Loss	Mortality Loss
		Burning CRP/SAFE	Mortality Loss	Mortality Loss
		Plowing CRP/SAFE	Mortality Loss	Mortality Loss
Dryland Agriculture	Field Preparation	Mowing stubble		Quality
		Burning stubble		Quality
		Rock pile removal		Loss
Dryland Agriculture	Weed/Pest Control**	Burning		Quality
Dryland Agriculture	Infrastructure	Road management	Loss Quality Positive	Loss Mortality Quality Positive
		Structures (fences, etc.)	Quality Positive	Mortality Quality
		Wildlife water	Positive	
		Wildlife reserves	Positive	Positive
Dryland Agriculture	Crop Management	Conventional seeding		Ind. Quality
		Direct seeding		Positive
		Irrigation		Positive
		Harvesting		Mortality
		Grazing		Quality
		Conservation crops (CRP/SAFE)	Positive	Positive
		Mowing/brush beating	Mortality Quality Positive	Mortality Quality Positive
		Burning	Quality Positive	Mortality Quality Positive
		Seeding	Quality Positive	Quality Positive
		Predator control	Loss Positive Mortality	Quality Positive Mortality
Ranching	Range Infrastructure	Road management	Loss Quality	Loss Quality Ind. Quality Positive

Land Use	Activity Category	Covered Activity	Burrowing Mammals*	Shrub-steppe grouses*
		Trail management	Quality	Ind. Quality Quality Loss
		Water development		Quality Positive
		Structures (fences, etc.)	Quality Positive	Quality Positive; Mortality
Ranching	Livestock Management	Grazing system	Quality Positive	Quality Positive
		Moving and herding	Mortality	
		Water distribution	Quality Positive	Quality Positive
		Salt distribution	Mortality Quality	Quality
Ranching	Livestock Management (cont.)	Wintering	Mortality Quality	Quality
		Confinement	Mortality Quality	Quality
		Calving	Mortality Quality	Quality
		Feeding	Mortality Quality	Quality
		Manure management		Ind. Quality
Irrigated Agriculture	Crop Maintenance	Tree planting	Loss	Loss

*Burrowing mammal and Shrub-steppe grouses groups were defined in Chapter 1, Table 1-2.

**The impact from application of pesticides (herbicides, rodenticides, etc.) is not a Covered Activity under the MSGCP, while impacts from the use of equipment, such as tractors, would be a covered activity. Current or future Section 7 consultations between the USFWS and the U.S. Environmental Protection Agency may cover those activities, and Applicants/Permittees will still voluntarily implement additional measures, such as no-spray buffers or integrated pest management, to focus pesticide use and minimize non-target impacts. Potential voluntary measures are listed on page E-11.

Definitions Key

Impact Type	Definition
Mortality	Potential exists for direct mortality of breeding-age animals as well as young and/or destruction of eggs, nests or burrows
Loss	Loss of habitat due to “permanent” conversion
Quality	Decline in overall habitat quality may be both direct and indirect
Ind. Quality	Decline in overall habitat quality may be indirect
Positive	Potential for positive benefits to habitat quality

While many of the farming and ranching impacts to the covered species are habitat based, including loss of habitat, continued levels of fragmentation, and changes to habitat quality (both positive and negative), there is also the chance of disturbance, injury, or mortality in some instances, as summarized in Table 3-1, above. Injury or mortality may occur from impacts to individual Columbia Basin pygmy rabbits or Washington ground squirrels, indirectly through loss of cover resulting in predation, and through disturbance or damage to burrows resulting in mortality or impaired breeding or sheltering. Injury or mortality could occur through mowing, burning, plowing, brush/beating, predator control, moving and herding livestock in occupied areas, or concentrating livestock operations in occupied areas. The injury or mortality could occur from machinery, livestock trampling, or impacts to burrows especially maternal burrows. With the exception of conversion of CRP/SAFE habitats, the likelihood of killing or injuring a Columbia Basin pygmy rabbit or Washington ground squirrel from these activities is probably small because they are mobile animals, and most burrows would not occur in farmed fields, but the likelihood increases as the exposed population increases.

For the shrub-steppe grouses, like the burrowing mammals discussed above, many of the farming and ranching impacts to greater sage grouses are habitat based. There is also the chance of disturbance, injury, or mortality in some instances. Injury or mortality may occur from impacts to individual greater sage grouse or Columbian sharp-tailed grouse, indirectly through loss of cover resulting in predation. In addition breeding and sheltering may be impaired through disturbance from farming activities causing nest abandonment, or through direct damage to nests. Injury or mortality could occur through mowing, burning, plowing, brush/beating, predator control, moving and herding livestock in occupied areas, or concentrating livestock operations in occupied areas. The injury or mortality could occur from machinery, livestock trampling, striking of structures, or impacts to habitat. As above for the other species, with the exception f conversion of CRP/SAFE habitats, the likelihood of killing or injuring a greater sage grouse or Columbian sharp-tailed grouse from these activities is probably small, but the likelihood will increase as the exposed population increases.

While scenarios of taking covered species can be described, these effects from covered activities are difficult to quantify, especially those effects that may injure, harm, or kill the covered species. We assume that implementation of BMPs under the MSGCP will result in a positive relationship between habitat condition trends and population trends of the Covered Species over the life of the permit. Because this MSGCP is programmatic in nature, it is difficult to predict the exact foot print of covered activities in relation to the exact distribution and populations of covered species. Therefore, we need to explore alternatives to predicting effects, acreages, and/or Covered Species populations over time.

Estimated Take of Covered Species

The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 U.S.C. 1532[19]). "Harm" in the definition of "take" in the ESA means an act that actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 C.F.R. 17.3[c]).

The FCCD and USFWS anticipate that Covered Activities and implementation of individual Farm Plans/GCP Site Plans will result in the incidental take of a small number of Covered Species, although the exact amount is difficult to predict because the covered species are mobile, relatively small in size, and cryptic. Locations of burrows, nests, and leks are not always known, so it is difficult to predict the overlap of agriculture activities to those locations. Surveys to estimate exact numbers and distribution of covered species in the Plan Area are limited, and even when population surveys are conducted (for greater sage grouse for example) they do not predict exact locations of individuals, nests, or burrows. In addition, the exact number, placement, and composition of future Permits is unknown in the Plan Area.

Because of the challenges of quantifying incidental take over time for a programmatic GCP, the FCCD and the USFWS explored three different approaches: 1) a Habitat Suitability Index model (HSI) and population estimate with a simple percentage of the population impacted, 2) a quantification of existing habitat coupled with the assumption that at most 50% of the acres in the County would be enrolled, and 3) an evaluation of potential future changes in CRP/SAFE acres over time and the potential conversion of some of those acres. The activity most likely to result in take of covered species would be conversion of CRP/SAFE acres in the future.

Habitat Modeling as a Predictor of Take

In 2005, the FCCD worked with WDFW and NRCS to develop a habitat suitability model (HSI). The model evaluated potential habitat quality and covered species population changes over time. The model was based on methods and ideas described in the "Ecological Services Manual – Habitat as a Basis for Environmental Assessment," and "Development of Habitat Suitability Index Models" (USFWS September 15, 1980). The model assumed that the relationship between habitat quality and quantity, and populations was linear, however the degree of habitat improvement will depend on how many farmers sign up. The model estimates effects, habitat changes, Covered Species exposure risk, and makes a general assumption regarding the level of incidental take of Covered Species over time. The HSI model is described in more detail in Appendix G. The model evaluated habitat for the entire countywide project area. Estimates of HSI-Acres (habitat acres weighted by quality) were defined for the existing conditions and projected out approximately 10 years and 50 years (Table 3-4 and 3-5). The model expected that there will be a gradual increase in habitat units (HSI-Acres). In the initial ten years, an increase

of 5 percent was modeled, and an 8 percent increase was expected by the 50-year point for the pygmy rabbit and Washington ground squirrel; and a 10 and15 percent increase was modeled for the greater sage grouse and Columbian sharp-tailed grouse as a result of BMP implementation under the MSGCP. Note that this model includes general habitats used by the species and/or its prey, not just the most limited habitats. WDFW noted in comments on the draft MSGCP that there is no clear connection between the BMPs and the habitat improvement. The Service agrees that the model can be improved, and in general, habitat suitability will improve over time, but the degree of improvement will depend on how many farmers sign up. The habitat improvement is displayed in Table 3-2 with equivalent HSI-Acres to show a quality improvement (improved quality should support more individuals of the covered species). Actual total acres of habitat on the ground may not actually increase. This model, or a similar model, will be run again early in the MSGCP implementation and used both for predicting population trends and impacts, and for monitoring habitat over time (described in more detail in Chapter 4 and AMMP).

The starting point for populations of the Columbian sharp-tailed grouse, greater sage grouse, and Washington ground squirrels associated with the habitat model (Table 3-2) were calculated by multiplying the quantity of HSI-Acres required for one individual of each species by the observed quantity of HSI-Acres in the County (Michael Schroeder, WDFW, Personal Communication, 2005) and compared back to results of population surveys. The estimates of population size for pygmy rabbits required a different approach. The HSI model was still used for habitat analysis and habitat trends, but the population estimates were based on results of reintroduction efforts. Known wild pygmy rabbit numbers were likely zero, or close to it, by the summer of 2004 (USFWS 2012). However, during 2011 and 2012, pygmy rabbits were introduced into soft-release pens at Sage Brush Flat Wildlife Area; many survived and reproduced; the animals in the large enclosures successfully reproduced over 300 kits during the 2012 and 2013 breeding seasons (Becker 2013). Normal mortality rates are high in pygmy rabbits; therefore, it is difficult to estimate a current population size (especially once the rabbits are released outside the pens). However, through the spring of 2013, over 200 kits had been released to the wild to join the small number of animals already established at the site (Becker 2013). Many of these rabbits are likely to remain at Sagebrush Flat Wildlife Area, but others may disperse onto Applicants/Permittees lands. Table 3-2 was adjusted to begin with 200 pygmy rabbits in 2013. It was assumed that the population would increase proportionately to the HSI-Acres.

The HSI modeling team assumed that because of conservation activities, in part from the MSGCP, populations of Covered Species on agricultural lands would increase in proportion with HSI-Acres over 50 years. Although the modeling team assumed that at least a 20 percent enrollment in the MSGCP was reasonable, for the habitat and population modeling they assumed a best-case scenario of all potential Permittees enrolling. While 100 percent enrollment is a goal, in practice it will most likely never be achieved. This information was used to quantify a

population that is, or may potentially be, exposed to Covered Activities. Based on best professional judgment, the FCCD made a general determination that up to five percent of the population exposed to Covered Activities may be incidentally taken from activities including disturbance, injury, or death from ongoing agriculture activities. Since populations of Covered Species are expected to increase over time with the increased habitat quality, there may be more individuals exposed to covered activities over time. A larger population means the take will increase, though the percentage will remain the same (Table 3-2). Under the MSGCP BMPs will be implemented to further decrease the risk of take.

Table 3-2: Estimated Trends in Habitat Availability, Populations at Risk, and Potential Maximum Annual Incidental Take for Covered Species during 50-year Permit

Covered Species	Existing Conditions			Year 10			Year 50		
	HSI-Acres[1]	Risk #[2]	IT #[3]	HSI-Acres	Risk #	IT #	HSI-Acres	Risk #	IT #
Columbia Basin pygmy rabbit	6,011	200	10.0	6,311	220	11.0	6,491	230	11.5
WA Ground Squirrel	37,930	215	10.8	39,827	226	11.8	40,965	232	13.4
Greater Sage-grouse	165,240	650	32.5	181,764	715	35.8	190,026	748	40.6
Columbian Sharp-tailed Grouse	61,847	619	31.0	68,031	681	34.0	71,124	712	38.7

[1]Total Habitat Suitability Index Acres by species; changes to acres indicate quality improvements.

[2]Estimated species population at risk is calculated by multiplying the quantity of HSI-Acres required for one individual of each species by the quantity of HSI-Acres in the entire County (Schroeder, WDFW, personal communication), except for pygmy rabbit: existing condition numbers at risk based on a round estimate of individuals after successful reintroduction effects in 2013.

[3]Estimated maximum incidental take of species by agriculture land management practices of 5 percent of at-risk population.

An initial model run will be conducted at the beginning of the MSGCP implementation based on recent imagery and methods. Monitoring habitat and revisiting the HSI model results initially during MSGCP implementation and over time will allow tracking of habitat changes (see Measure 6 in AMMP). The AMMP also allows use of a different modeling process in the future, as long as the baseline and changes over time are comparable to the initial HSI model. As stated previously, it is difficult to quantify take as a result of disturbance, harm, injury, or death due to typical ongoing agriculture activities, and even more difficult when the exact location of future Permittees is not known. The HSI model does a good job of estimating habitat trends and the number of covered species individuals that may be exposed to agriculture activities in the County, but the 5% of the populations that may be taken is really just a ball-park estimate. These estimates help to display trends over time, but habitat impacts are likely more measurable and reliable.

Using Current Habitat Levels as a Surrogate for Take

A second way to evaluate effects and look at incidental take of Covered species is to use habitat quantity as a surrogate for take, and assume activities on all acres have an equal chance of injuring, killing, or harming individuals. Using the methods described below, the USFWS estimated the acres of covered species habitat on agriculture lands in Douglas County. This

method provides an upper level of take that may occur through a habitat surrogate, however it is likely that not all activities on all acres would result in harm and harassment of the covered species, so this is likely an over estimate,

For the pygmy rabbit, the USFWS (in lit 2014) determined that there were 214,000 acres of shrub steppe habitat within the historic range on agriculture lands in Douglas County. The most likely locations for pygmy rabbits in the County are at and around the Sage Brush Flat wildlife area, since this is where the initial reintroduction efforts have occurred. Once reintroduced, pygmy rabbits may disperse gradually from that location over the life of the MSGCP. We don't know which landowners will sign up for the GCP, but it is reasonable that 20% of the agriculture acres in the county will be covered, and 50% is a likely upper limit. Twenty percent of 214,000 acres is 42,840, and 50% would be 107,000 acres of habitat. These are the acre quantities where agriculture activities that may harm or harass the pygmy rabbit may occur over the life of the MSGCP.

The Washington ground squirrel, the Columbian sharp-tailed grouse, and the greater sage grouse historic range includes much or all of Douglas County. The USFWS used 2010 GAP data to determine that there are approximately 413,805 acres of shrub-steppe in Douglas County. We don't know which landowners will sign up for the GCP, but it is reasonable that 20% of the agriculture acres in the county will be covered, and 50% is a likely upper limit. Twenty percent of 413,805 acres is 82,761 and 50% would be 206,903 acres of habitat. These are the upper acre quantities where agriculture activities that may harm or harass the Washington ground squirrel, Columbian sharp-tailed grouse, or greater sage grouse may occur over the life of the MSGCP.

This assessment of take is based on shrub-steppe acres and does not quantify take from disturbance that may occur on cropped fields, for example wheat fields that are used as leks by sage grouse. However, that type of take is unlikely to occur once BMPs are implemented through individual permits. Pygmy rabbits and Washington ground squirrels tend to avoid open areas since they are very vulnerable to predation, therefore the risk of take from activities on cropped fields is low.

CRP/SAFE Acre Conversion as a Surrogate for Take

A third way to analyze potential incidental take is to quantify the amount of CRP/SAFE acres that may be converted over the 50-year duration of the MSGCP. Conversion is one of the more likely activities that may result in take of the covered species due to potential loss of breeding habitat, burrows, nests, and leks. Depending on Farm Bill programs, CRP/SAFE and similar acres may increase and decrease over time. As of June 2013, there were 182,072 acres of CRP/SAFE in Douglas County, and about 868,217 acres of non-orchard farms in the County (therefore 21% of farm acreage enrolled in CRP). Under the MSGCP, a decrease of greater than 10% CRP/SAFE (18,207 acres) could occur, although it is expected that they will get back above the 10% threshold within 2 years after each decrease. Based on contract lengths, this may occur

up to 6 times during the life of the MSGCP. We assume that up to 50% of the agriculture acreage may be enrolled in the MSGCP, and assume that that could involve 50% of the change to the CRP/SAFE acres, or 9,104 acres. CRP/SAFE acres within the range of the pygmy rabbit are somewhat lower because its historic range does not include all of Douglas County. These acreage estimates of CRP/SAFE conversion are a likely upper limit, because the actual incidental take impact of each covered species will vary with the opportunities for CRP/SAFE renewal, potential species distribution over time, spatial arrangement of CRP/SAFE changes within the County, and the potential that some farmers may choose not to crop CRP/SAFE parcels even if contracts expire. Table 3-3 displays the take habitat surrogate based on conversion of CRP/SAFE acres.

Table 3-3. CRP/SAFE Conversion Estimates

Covered Species	**CRP/SAFE within species range in Douglas County**	**10% decrease in Douglas County through conversion of CRP/SAFE allowed in MSGCP for 2 year duration**	**50% of farmers may enroll, therefore 50% of conversion may occur on Permittee's land. Frequency: 6 times during life of GCP.**
Pygmy Rabbit	48,203 acres	4,820 acres	2,410 acres
Washington Ground Squirrel	182,072	18,207 acres	9,104 acres
Greater Sage Grouse	182,072	18,207 acres	9,104 acres
Columbian Sharp-tailed Grouse	182,072	18,207 acres	9,104 acres

In summary, it is difficult to predict incidental take to covered species due to the programmatic nature of the MSGCP, and the mobile nature of the covered species. The USFWS explored three methods described above. While the HSI model is useful for evaluating habitat in the future, the take estimate component based on the model is very general, and individuals taken will be difficult to measure in the future. Using habitat as a surrogate for take is a better fit for this MSGCP. The general habitat surrogate would likely be associated with disturbance, injury, or death of dispersing or foraging individuals from ongoing agriculture activities, although the likelihood of this type of take is low due to the behaviors of the covered species and the implementation of BMPs. The CRP/SAFE acres conversion surrogate would be more likely to

result in impairment of breeding, feeding, and sheltering and potentially resulting in mortality from conversion of nesting, burrowing, or foraging habitat; or by making covered species more vulnerable to predation.

Douglas County Multiple Species General Conservation Plan

Chapter 4: MSGCP Implementation

Chapter Overview

Chapter 4 details the steps necessary for proper implementation of the MSGCP, including the responsibilities of the various entities and committees, funding levels, monitoring and evaluation measures, and explanation of Changed Circumstances.

Duration

The MSGCP is intended to cover a 50-year period from its initial approval by the USFWS. Individual permits issued under the MSGCP may be shorter than 50 years depending upon permit issue dates. Long term factors will continue to be assessed and revisited as the MSGCP is implemented. For example, at 10-year increments (or sooner if indicated) long-term factors such as, climate change and effect on growing conditions and habitats will be reviewed to ensure MSGCP expectations are being met. This will be coordinated by the FCCD Manager in conjunction with the IM Committee, other entities and signatories to the MSGCP to incorporate and analyze the trend data required to evaluate the performance of the MSGCP. The review will be performed by the FCCD Board and USFWS. Review and timing expectations are described below under Changed Circumstances.

Individual Property HCP Development

As described earlier, implementation of the MSGCP includes the following steps for an individual Applicant/Permittee:

1. Develop a Farm Plan using the RMS or similar process (see below, and Appendix H), and use GCP Site Plan Checklist (Appendix B).
2. Determine conservation practices to implement in the Farm Plan (Appendix E). Conservation practices (CPs) will result in improved habitats, but many species need additional site-specific measures to minimize effects.
3. As appropriate based on activities, ranges, and habitats, select and implement additional measures by land-use categories (Appendix E, Table E-2) and species-specific measures (Appendix E, Table E-3). To determine need for species-specific measures, review species range maps and any known location data for Covered Species (Appendix D).
4. After the development of the Farm Plan and GCP Site Plan and review and support from the FCCD, and with potential technical assistance from the USFWS, the Applicant applies for a Section 10 permit from the USFWS.

5. After a Federal Register notice and public comment, if the application meets the expectations of the MSGCP and decision documents and meets other issuance criteria, the Applicant will receive a permit from the USFWS.
6. Applicant/Permittee implements the plan.
7. FCCD and the Applicant/Permittee monitors, per Chapter 4 and HSI process in Appendix G.
8. Adjust BMPs, Farm Plan/GCP Site Plan and/or Permits over time as appropriate per AMMP.

Prior to receiving a Section 10 permit, a Farm Plan and GCP Site Plan must be completed by the Applicant, the Applicant's appointee (such as a consultant), or the Conservation District, with an adequacy review by the FCCD. The plans will provide a description of on-going and planned agricultural activities for lands to be covered and, as appropriate, will include additional land-use measures and species-specific measures as described in Appendix E. Completion of the USDA Conservation Security Program Self-Assessment Workbook is a recommended planning tool (http://ias.sc.egov.usda.gov/Help/CSPWeb/docs/CSPWkBk.pdf) for developing a Farm Plan. The Farm Plans will be similar to NRCS Conservation Plans and will likely use the Nine-Step process. Each Farm Plan will start with the following phases and steps (see Appendix H):

Phase I – Data Collection and Analysis

1. Identify Problems.
2. Determine objectives (to include meeting MSGCP goals if higher than CP objectives).
3. Inventory Resources.
4. Analyze Resource Data.

Note: The Collection and analysis of data could utilize any approved agency format such as:

- NRCS Checklist of Resource Problems or Conditions for WA State and associated mapping protocols.
- WDNR Resource Assessment checklist
- WDFW HB 1309 Ecosystem Standards Checklist
- FCCD could develop a checklist that is specific for Douglas County

Phase II – Decision Support

1. Formulate Alternatives.
2. Evaluate Alternatives.
3. Make Decisions.

Note: Each alternative developed and evaluated for an operation will be based upon a NRCS Resource Management System comprised of a combination of approved CPs and resource management action that, when applied, bring all natural resource concerns up to quality criteria. These practices and actions will meet or exceed minimum quality criteria for all CPs

recommended for Covered Activities. Several of the Covered Species have land-use measures and species-specific measures that are more protective or contain additional requirements than the standard NRCS CP. These requirements were developed by FCCD with their Private Landowner Committee (PLC) and the Technical Advisory Committee (TAC) during the development of the MSGCP. If all quality criteria cannot be met initially, the plan is implemented over time and is considered a progressive RMS plan, although even then the MSGCP expects that most BMPs can be implemented initially to result in short-term and long-term positive habitat improvement.

Phase III –Application and Evaluation

1. Implement Farm Plans, GCP Site Plans, and the MSGCP.
2. Evaluate Farm Plans, GCP Site Plans, and the MSGCP.

Issuance of Permits

When FCCD, with technical assistance from USFWS, determines that the Farm Plan/Site Plan is appropriate, the Applicant/Permittee will apply for a Section 10(a)(1)(B) permit. The USFWS will approve permits that meet the expectations of the MSGCP and related decision documents and that meet issuance criteria.

Organizational Structure

Foster Creek Conservation District

Pursuant to the Implementation MOU between the USFWS and FCCD (Appendix I), the FCCD will assist Applicants/Permittees in the implementation of the MSGCP. The FCCD Manager will be the contact person for these aspects of the MSGCP. There is an additional coordination MOU (Appendix A) which describes continued coordination and technical assistance between the USFWS, WDFW, the Nature Conservancy, BLM, and the FCCD.

Duties and Responsibilities of the FCCD Board of Supervisors

The Board of Supervisors will provide the policy direction for the implementation of the Implementation MOU and the MSGCP and will provide opportunities for public participation, as appropriate, in the decision-making process. The Board of Supervisors duties will include, but are not limited to, the following:

1. Establish a Funding Coordination Committee and designate the Plan Administrator and key staff including the Monitoring Program Administrator.
2. Establish policies as appropriate under which the Funding Coordinating Committee will make recommendations to the Board of Supervisors.
3. Ensure covered MSGCP lands are managed as expected in Farm Plans/GCP Site Plans.
4. Coordinate with outside entities for specific services such as research or monitoring.

5. Develop and implement financing strategies to maximize funding sources to continue implementation of the Implementation MOU and the MSGCP.
6. Review MSGCP expectations annually.
7. Adopt an annual budget for implementation of the Implementation MOU and the MSGCP.
8. Act as custodian of records for information concerning MSGCP implementation.
9. Maintain a record of the number of Permittees, acreages covered, and amount of incidental take and habitat loss for each local Permittee.
10. Hold public meetings as needed and as appropriate.

Duties and Responsibilities of the MSGCP Administrator

Duties of the MSGCP Administrator will include, but are not limited to, the following:

1. Plan, organize, coordinate and direct MSGCP staff to develop goals and annual work plans that are then acted on by the FCCD.
2. Develop and direct the implementation of goals and work activities adopted by the FCCD Board of Supervisors.
3. Coordinate implementation of the MSGCP with Permittees and Federal and State wildlife agencies. During the first three years of implementation of the MSGCP, the Plan Administrator and appropriate wildlife agency representatives will meet every six months if necessary to review the state of MSGCP implementation.
4. Ensure the conservation mechanisms are properly documented for lands enrolled by Permittees.
5. Ensure adequate exchange of information between the Permittees and the Monitoring Program Administrator so that Permittees can contribute to the monitoring program.
6. Oversee the Monitoring Program Administrator and ensure that the functions of the Monitoring Program Administrator are being satisfactorily carried out.
7. As needed, obtain the services of independent science advisors to address specific issues and to provide recommendations based on the best available scientific information concerning scientific aspects of the MSGCP.
8. Oversee data management, including maintaining the MSGCP's Geographical Information System (GIS) database and providing a back-up copy to the Douglas County GIS staff and USFWS annually. The database will be updated at least annually as follows:
    a. Data derived from inventory and research activities on species occurrence and habitat distribution in the Plan Area.
    b. Data on the status of land in the Plan Area including lands which are signed up in the MSGCP, changes to CRP/SAFE or other similar program acres, changes to individual permits, and lands on which any development has occurred.
    c. Data derived from reports from the Permittees, the County, or others, on the status of land within the Plan Area, including habitat loss, annexations and incorporations.

9. Maintain remote sensing database of current and historical aerial photos and/or satellite images.
10. Maintain or develop a list of survey protocols approved by FCCD and/or USFWS for surveys required by avoidance and minimization measures.
11. Maintain and provide to Applicants/Permittees maps of modeled habitat for Covered Species and a natural community's map.
12. Maintain peer-reviewed journal articles that provide information on habitat management for Covered Species.
13. Coordinate with State and Federal agencies on MSGCP funding.
14. Prepare annual report providing information and evaluating implementation progress, habitat quality changes, and Covered Species status and populations.
15. Prepare, submit and coordinate with USFWS and WDFW all amendments to the MSGCP.
16. Assist in resolving disputes between Permittees and USFWS and WDFW.
17. Coordinate the preparation and administration of the MSGCP's annual budget.
18. Develop policies and procedures to administer MSGCP functions and activities.
19. Ensure compliance with Federal, State, and local laws and regulations.

U.S. Fish and Wildlife Service

Duties of the U.S. Fish and Wildlife Service will include, but are not limited to, the following:

1. Provide technical assistance during implementation of the MSGCP, including assistance in education and potential workshops with Applicants/Permittees and other interested publics, and assistance with cultural resources and NHPA as appropriate.
2. As feasible and appropriate, provide technical assistance to use other ESA tools or programs to conserve species and complement the MSGCP in Douglas County.
3. Advise FCCD on available grant opportunities.
4. Subject to the availability of federal appropriations, develop and encourage implementation of recovery plans for Federally-listed species.
5. Inform the FCCD of any Federal species listing proposals relevant to Douglas County.
6. Inform the FCCD of any critical habitat designations for Federally listed species relevant to Douglas County.
7. Support consolidation of public ownership into the Moses Coulee Management area or other key areas in Douglas County to provide HCA lands.
8. Conduct and/or review compliance monitoring to verify that actions are being accomplished on the ground as outlined in the MSGCP and reports. Monitoring on private land will be done with notice and permission, except that the USFWS may conduct inspections and monitoring in connection with the Permits in accordance with the ESA and its implementing regulations (see, e.g., 50 C.F.R. § 13.47).
9. Maintain a record of the number of Permittees, acreages covered, and amount of incidental take and habitat loss for each local Permittee.

Implementation and Monitoring Committee (IM Committee)

The FCCD will establish the management and administration of the IM Committee and will utilize the IM Committee to review and comment on GCP Site Plans, and budgets submitted to the Plan Administrator. The major purpose of the committee will be to review and comment upon the progress of implementation of the MSGCP and to recommend expenditures. The IM Committee will also ensure that all interested parties will be notified of habitat-management decisions and implementation measures and will be able to comment prior to funding by the MSGCP. This committee will meet as needed but will not function as day-to-day administrator of the Plan. This committee reports only to the FCCD at the request of the FCCD; it is not established or utilized by the USFWS. The FCCD may choose to use information from the IM Committee during implementation of aspects of the MSGCP and may share that information with the USFWS.

Duties of the IM Committee

Duties of the IM Committee will include, but are not limited to, the following:

1. Evaluate and recommend approval, denial, or modification of proposed expenditures for the MSGCP.
2. Monitor MSGCP implementation and schedule; suggest changes or improvements.
3. Coordinate the results from inventories and surveys that may be applicable to monitoring the progress of the MSGCP implementation.
4. Establish any technical advisory subcommittees that would assist the IM Committee with decisions of a technical nature. Members of the subcommittee would not be required to be members of the IM Committee.
5. Establish a subcommittee that would assist the Plan Administrator in the implementation of a public-information program. Members of the subcommittee would not be required to be members of the IM Committee.
6. Recommend to the Plan Administrator any administrative studies, research or other projects that have not been suggested for funding by the State or Federal resource managers that may be important for conservation of the species and ecosystems in the MSGCP area.
7. The IM Committee will develop the biennial budget prior to submittal of a complete budget to the Districts' Board of Supervisors for approval.
8. Implementation of the Public Information and Education Program.
9. Cooperate and coordinate with the Federal, State and conservation organization land managers (i.e., TNC) to develop complementary conservation actions and to avoid duplication of effort or incompatible conservation actions.
10. The FCCD and the IM Committee, with possible technical assistance from the USFWS, WDFW and other sources, will implement workshops as necessary for Applicants/ Permittees and other interested publics to assess the effectiveness of the planned Covered Activities, BMPs, and Adaptive Management and Monitoring Plan (AMMP).

The MSGCP's implementation and monitoring strategy is directed through FCCD to the IM Committee. This strategy is intended to provide direction to the Plan Administrator for collaboration among Permittees as well as management and administration of the MSGCP. The IM Committee will consist of representatives of both government agencies and non-government organizations. General contributions to the implementation and monitoring process of individual committee members would include, but not be limited to, participating in annual meetings, reviewing reports, assisting in the preparation of operational budgets and supporting site visits and field trips. The functional tasks of IM Committee Members are shown in Table 4-1.

The FCCD through its Manager will be responsible for implementing the coordination MOU (Appendix A) and other aspects of the MSGCP. IM Committee members are expected to carry out the responsibilities listed in Table 4-1 in support of the FCCD through a Memorandum of Understanding, Appendix A.

Table 4-1: Functional Task Responsibilities of MSGCP IM Committee Members

Functional Task	**IM Committee Members**
Administration and Coordination	Bureau of Land Management (USDI) Farm Service Agency (USDA) Natural Resources Conservation Service (USDA) The Nature Conservancy
Education and Public Awareness	Natural Resources Conservation Service (USDA) The Nature Conservancy Washington Department of Fish and Wildlife (WDFW)
Technical Assistance	Natural Resources Conservation Service (USDA) The Nature Conservancy Washington Department of Fish and Wildlife (WDFW)
Inventories and Surveys	Bureau of Land Management (USDI) Farm Service Agency (USDA) Natural Resources Conservation Service (USDA) The Nature Conservancy Washington Department of Fish and Wildlife (WDFW) Washington Department of Natural Resources (WDNR)

Washington State Department of Fish and Wildlife

Duties of the Washington State Department of Fish and Wildlife will include, but are not limited to, the following:

1. Coordinate with USFWS and the appropriate stakeholders and land managers to develop species recovery plans as needed.

2. Include information about the MSGCP or Covered Species in agency hunting and fishing publications as relevant, especially regarding greater sage-grouse, Columbian sharp-tailed grouse, Washington ground squirrel, or pygmy rabbit identification.
3. Facilitate awareness of the MSGCP in ongoing projects in north central Washington.
4. Conduct and/or support life history assessments and population surveys for native wildlife species in Douglas County. Species covered in the MSGCP will be considered when developing monitoring priorities.
5. Continue to survey and document ranges, populations, and habitats for Covered Species in Douglas County, as expected in the MSGCP Table 4-5: Monitoring and Evaluation Measures.
6. Coordinate with the Adaptive Management/Monitoring Programs in setting species priorities, selecting survey methods, and evaluating data collected.
7. Prohibit unauthorized off-road driving on agency lands in Douglas County.
8. Support efforts to apply integrated pest practices in the management of unwanted vegetation on public and private lands.
9. Provide technical assistance (i.e.: information on site preparation, plant materials, and planting techniques) to the IM Committee for habitat enhancement or restoration practices.
10. Provide consideration to MSGCP Applicants/Permittees as WDFW private-lands-biologists plan and implement habitat restoration and enhancement projects.
11. Manage agency-owned or -controlled lands in accordance with goals set by HB1309 Ecosystem Standards and adhere to Wildlife Area management plans.
12. Coordinate with and provide technical assistance to the IM Committee including, but not limited to, the development and implementation of the Adaptive Management/Monitoring Program, review, evaluation and collection of data for Covered Species, and assistance in related Applicant/Permittee or public workshops.
13. Coordinate with BLM and USFWS on MSGCP species issues in Douglas County.
14. Regulate hunting, fishing, and trapping in Douglas County.
15. Review any potential sales or trades of WDFW-owned land within Douglas County as to their impacts on HCA habitat for the MSGCP.
16. Commit to seek funding to allow WDFW to perform fully the obligations and tasks pursuant to the MSGCP, including, but not limited to, coordinating with and providing technical assistance to the IM Committee.
17. Assist Applicants/Permittees and other County landowners with management of wildlife-related recreation through various regulated access programs offered by WDFW.
18. Share appropriate data regarding the MSGCP and Covered Species with FCCD.
19. Consider the MSGCP when making agency decisions regarding harvest, predator control, enforcement emphasis, education, and outreach.
20. Consider additional property acquisition and/or conservation easements as appropriate to ensure protection and enhancement of the HCA lands.

Natural Resources Conservation Service (USDA)

Duties of the Natural Resources Conservation Service will include, but are not limited to, the following:

1. Assist with Farm Plans and/or GCP Site Plans; inform IM Committee of changes in CPs.
2. Develop new BMPs or revise old BMPs as information is available.
3. Ensure cultural resource and historic preservation compliance as appropriate for NRCS programs
4. Promote existing or new Farm Bill programs to complement MSGCP in Douglas County.

Farm Service Agency (USDA)

Duties of the Farm Service Agency will include, but are not limited to, the following:

1. Continue CRP/SAFE and other FSA program implementation, including farm field compliance checks as required by each program.
2. Ensure cultural resources and historical preservation compliance as appropriate for FSA programs.
3. Provide data to FCCD on acreage changes on individual farm tracts enrolled in Farm Bill programs.

Washington State Department of Natural Resources (WDNR)

Duties of the Washington State Department of Natural Resources will include, but are not limited to, the following:

1. Continue to manage WDNR lands according to Washington State HB1309 Ecosystem Standards and other agency mandates.
2. Verify lease compliance; manage and monitor leased lands to ensure range health. Fifteen percent of leases checked per year, as resources allow.
3. Adopt MSGCP expectations into future Resource Management Plans.
4. Conduct residue checks—Measured T value on 100 percent of lands seeded each year.
5. Retain ownership in Douglas County and consolidate public ownership of WDNR Heritage Lands into the Moses Coulee Management area to provide HCA lands.

Bureau of Land Management (USDI)

Duties of the Bureau of Land Management will include, but are not limited to, the following:

1. Retain ownership in, and to the extent possible, support the consolidation of public ownership into, the Moses Coulee Management area.
2. Subject to the availability of federal appropriations and resources, survey and document ranges, populations, and habitats for Covered Species.

3. Subject to the availability of federal appropriations and resources, apply integrated pest-management practices to control unwanted vegetation on public lands.
4. Provide technical assistance (site preparation, plan materials, and planting techniques) to the IM Committee for habitat enhancement or restoration practices.
5. Manage agency-owned or -controlled lands in accordance with the Spokane Resource Management Plan (1992), or revisions of the plan. Implement the BLM National Sage-Grouse Habitat Guidance Strategy or future revisions, and as appropriate, consider management guidelines provided by State agencies, such as the 2004 WDFW *Greater Sage-Grouse Recovery Plan.*
6. Coordinate with and provide technical assistance to the IM Committee on issues including, but not limited to, the development and implementation of the Adaptive Management/Monitoring Program; and on collection, reviewing, and evaluating, data for Covered Species.
7. Coordinate with WDFW and USFWS on Covered Species issues in Douglas County.

The Nature Conservancy

Duties of The Nature Conservancy will include, but are not limited to, the following:

1. Collaborate with the USFWS, WDFW, BLM, and others where appropriate to provide sites for reintroducing federally endangered pygmy rabbits as appropriate and feasible.
2. Provide information about the MSGCP as appropriate and feasible in State and organizational publications.
3. Assist in exporting "lessons learned" through the MSGCP to other communities and landscapes as appropriate in North Central Washington and beyond.
4. Promote and make available to the MSGCP program, research findings as appropriate related to the Covered Species and their habitats.
5. Work with agencies and other cooperating private landowners by monitoring species and community conditions as funding allows.
6. Coordinate with ongoing species and community inventory and analysis as funding allows.
7. Restrict public use of TNC owned lands in the area where appropriate in cases where such use poses a significant threat to habitat, ongoing research, or safety.
8. Share relevant research results related to habitat restoration including livestock grazing, weed control, and other land-management methods.
9. Continue collaboration with the USFWS, Douglas County Coordinated Weed Management Area, FCCD, and others to coordinate efforts for eradicating invasive weeds on public and private lands.
10. Continue TNC efforts to develop and/or increase shrub-steppe restoration capacities.
11. Protect and manage TNC properties in the area as HCA lands, where appropriate.
12. Cooperate with and provide technical assistance to the IM Committee, including assistance in the development and implementation of the Adaptive

Management/Monitoring Program, and review and evaluation of and/or assistance in collection of data for Covered Species.

13. Coordinate with BLM, WDFW, USFWS, WDNR, and others on MSGCP species issues in Douglas County.
14. Consider additional property acquisition as appropriate to ensure protection and enhancement of the HCA lands.

Monitoring Covered Species

In addition to the commitments above, commitments by Committee members and other entities for monitoring each of the Covered Species in the MSGCP are shown in Table 4-2.

Table 4-2: Commitments by IM Committee Members and Others to Monitor Covered Species

Covered Species	Agency/Entity	Comments
Pygmy Rabbit	USFWS, WDFW	Will be monitored as part of implementing pygmy rabbit recovery actions. Subject to the availability of Federal appropriations
Washington Ground Squirrel	WDFW	Will include with other existing programs, but no firm commitment for new monitoring project
Columbian Sharp-tailed Grouse	WDFW	Currently monitored by WDFW's ongoing work in the Plan Area.
Greater Sage-grouse	USFWS, WDFW	Currently monitored by WDFW's ongoing work in the Plan Area. Subject to the availability of Federal appropriations

MSGCP Administration

Publishing and Distributing the MSGCP

The Douglas County Draft and Final Multiple Species General Conservation Plan and associated Draft and Final Environmental Assessments will be published and distributed electronically including on websites, and hard copies will be available for review at the FCCD office. Additional hard-copies will be provided at request by the FCCD and Service as resources allow.

Reaching a Signed Agreement with Applicants in the MSGCP

Each MSGCP Applicant will work with FCCD to develop a Farm Plan and GCP Site Plan and apply for an individual section 10(a)(1)(B) permit receive coverage for incidental take of Covered Species. The FCCD will enter into an MOU with the USFWS to implement and monitor the MSGCP (Appendix I).

Programmatic Funding Process

Section 10 of the ESA requires an applicant of a habitat conservation plan to "assure funding" for the plan. Each Applicant/Permittee must ensure funding for implementation of their Farm Plan/GCP Site Plan, and because the FCCD will be the responsible agency administrating the Implementation and Monitoring (IM) phase of the MSGCP (see MOU in Appendix I), they will also require funding.

FCCD Funding

The MSGCP raises unique funding challenges. Without a predefined acreage enrolled in the MSGCP, FCCD must provide an ongoing adaptive approach to acquire funding as acreage is added and subtracted from inclusion under the MSGCP. Most programmatic HCPs are funded in part by a mandatory assessment fee charged against the landowner when undeveloped land with significant habitat value is converted to other uses. While an assessment fee may be part of this MSGCP, it is not likely to be a large fee, and the FCCD must find additional funding for implementation.

The FCCD receives funding from the Washington State Conservation Commission (WSCC) annually to support District programs. This funding is to be used for the operation of the District, including wages and benefits for District employees who will comprise the initial IM Staff for implementing the MSGCP. FCCD will develop a comprehensive budget plan to acquire adequate funding to implement their responsibilities under the MSGCP.

In Table 4-3, the expenses estimated for the FCCD portion of the MSGCP are $82,500 per year. FCCD will utilize all appropriate District funds and grant funding opportunities to ensure continued operation of the MSGCP. Because the FCCD receives State money, they can't provide long term guarantees for funding over 50 years. Instead, they will provide an annual funding plan and offer to meet with the Service by July 31 of each year to demonstrate funding adequacy for the next year, at minimum. The FCCD has adequate funds to implement the first year of the MSGCP. If the FCCD cannot find adequate funds for implementation of the MSGCP, they will provide notice to the Service, and if adequate money for implementation is not found, the Service may revoke Permits issued under the GCP. Funding is also discussed under MSGCP Administration.

Annual Budget for FCCD MSGCP Implementation

Table 4-3: Estimated Implementation Expense Budget for the FCCD

Expense	Annual	50 Year Term*
Salaries/Benefits	$62,750	$3,645,255
Mileage/Travel	$6,000	$348,550
Equipment	$1,000	$58,092
Goods/Services	$2,000	$116,183
Overhead (15% of S/B, M/T, E, G/S)	$10,750	$624,485
Totals	$82,500	$4,792,565

*Includes 3% annual inflation factor

Direct Funding for FCCD MSGCP Implementation

Table 4-4: Estimated Direct Funding for FCCD MSGCP Implementation

Funding Source	First Year	50 Year Term*
Washington State Grants	$62,500	$3,630,732
Washington State Basic Funding	$10,000	$580,917
Douglas County Basic Funding	$2,500	$145,229
NRCS and WSCC RMS Task Order Funding	$7,500	$435,687
Totals	$82,500	$4,792,565

*Includes 3% annual inflation factor

Local, State, and Federal agencies and non-governmental organizations that support the MSGCP (See MOU, Appendix A) or contribute to conserved lands in Douglas County will be managing their lands (HCAs) within the Plan Area in part for the benefit of the Covered Species. As described earlier in this document, it is likely that these lands will continue to stay in State, Federal, and Non-Governmental Organization (NGO) ownership, and will be managed to the benefit of wildlife species. The MSGCP also includes a "Changed Circumstance" section that will ensure monitoring quantities of the HCA lands in the County in case the acres, ownership, or management changes in the future (See below, page 106).

Applicant/Permittee Funding

Costs for Applicants to implement the MSGCP will vary widely and will include direct and indirect costs. The minimization and mitigation efforts described in the MSGCP for Permittees include contributions from agricultural Permittees and are often built on existing farm programs.

Applicants/Permittees will be foregoing agricultural production in favor of providing increased habitat quantity and quality as well as implementing CPs in the MSGCP. BMPs are entirely funded either by the Permittee or through a combination of cost share through various USDA programs (i.e., CRP/SAFE, EQIP, and GRP). Additional land use or species-specific measures do not have a funding source and are therefore paid for directly or indirectly by the Permittee, often through foregoing agriculture production or being less efficient in their agriculture production. These costs associated with BMPs usually take the form of opportunity costs. In other words, affirmative funding is generally not required as the Applicants operate in a way to provide the conservation practice and the operation reduces their profits to a certain degree. Many Applicants/Permittees do receive payments under Farm Bill programs (CRP/SAFE etc.) which are helpful to ensure that they can afford to forgo production and implement additional BMPs. However, each Permittee is responsible for ensuring that funding is available for their direct costs, regardless of whether funding is available through such programs.

Annual Reporting

An annual report authored by FCCD and Permittees and submitted to the USFWS will be prepared to document Permittees' compliance with the MSGCP. The annual report for the preceding calendar year will be submitted by June 30 of the following year. FCCD may choose to share the report publicly or share it at a public workshop. The annual report will include the following information:

1. An overview of the status of the Plan Area, including numbers of farmers and acres enrolled.
2. Results of biological monitoring, inventories, or surveys, and description of adaptive-management actions identified and whether or not such actions were implemented.
3. A description of conservation activities in the Plan Area for the previous year.
4. An accounting of the number of acres on which Best Management Practices were initiated or modified as a result of MSGCP implementation activities.
5. An accounting of the number of acres within the Plan Area of Covered Species habitat that were impacted by non-conservation (development) or conversion activities during the previous year.
6. An evaluation of any significant issues encountered in MSGCP implementation during the previous year and their proposed resolution.
7. Expenditures for MSGCP implementation over the previous years and an applicable budget for the upcoming year.
8. A status summary of compliance activities required of Permittees.
9. A summarized proposed plan of action for implementation activities during the coming year.

Adaptive Management and Monitoring Plan (AMMP)

It is expected that the initial BMPs identified in this MSGCP will be effective in conserving both the Covered Species and the habitats that support these species. Conditions within Douglas County, the status of habitats, and the overall condition of individual species over time can be expected to change due to a variety of potential factors. In addition, it is quite likely that additional and different BMPs not currently described within this MSGCP will be suggested, developed, and/or implemented by farmers and found to be effective in meeting the goals of the MSGCP. Thus, an AMMP will be implemented to evaluate the effectiveness of existing BMPs and to frame additional or alternative BMPs that might be needed to move more efficiently towards improved habitat quality or quantity. The AMMP will provide an objective, quantitative evaluation of the effectiveness of 1) management actions in attaining program goals and 2) inventory, monitoring, and research results and interpretation. The AMMP will provide FCCD, Permittees, and USFWS with:

1. A scientifically sound land-management conservation approach with flexibility for change in the future.
2. An objective scientific data and analysis format upon which to base management decisions, as well as scientifically valid evaluation of management actions.
3. A set of objective and scientifically valid evaluations of the need for various future actions, as well as an assessment of the effectiveness of those actions.

A critical element of the AMMP is the database upon which management decisions are made. Such a database provides the basis for evaluating species, ecosystem, and/or landscape level status and trends, as well as individual Farm Plan/GCP Site Plan implementation. In addition, it can be used to evaluate management actions directed at conservation of biological resources. Adaptive management requires an objective and scientifically valid program for collecting scientific data, coupled with supervision of an accessible database by a competent scientific authority and quantitative evaluation of the data.

Specifically, the AMMP would:

1. Complete an annual analysis of all land-use trends, including conversion to urban use, acreage in HCAs, and acreage in CRP/SAFE or similar programs, in Douglas County to make sure that species "take" and habitat disturbance is following trends predicted in this MSGCP.
2. Evaluate implementation success of BMPs.
3. Monitor ecosystem health over the Plan Area.
4. Review species or population monitoring results over the Plan Area.
5. Evaluate the effectiveness of management actions in moving the Plan Area towards the MSGCP expectation of improved habitat quality and quantity over time.

AMMP: Covered Species and Habitat Inventory, Monitoring, and Research

Inventory and monitoring strategies are intended to assess the effectiveness of restoration projects and management actions on wildlife populations and the habitats that support them (Hillman 2003). An inventory monitoring strategy for the MSGCP will be implemented by FCCD with the following elements:

1. A trend-monitoring program on habitat distribution based on remotely-sensed data obtained from sources such as aerial photography or satellite imagery or both with ground-truthing.
2. Coordination with WDFW species monitoring programs to evaluate and refine estimated Plan Area population trends predicted by habitat models.
3. Monitoring specific locations within the Plan Area to document habitat changes over time.
4. Creation of a Permittee self-monitoring program.

The MSGCP's inventory and monitoring strategy is intended to identify sources of ecological disturbance that can compromise ecosystems and their constituent species. Environmental stressors would include both natural and anthropogenic phenomena including climate change, fire, toxic pollutants, disease, flood, water diversions, and invasions of exotic species.

The FCCD and USFWS agree that an ongoing adaptive management and monitoring program must be implemented for the MSGCP to achieve the goals of minimization and mitigation of impacts to the Covered Species. It must be recognized that participation in species conservation is not strictly limited to farmers and ranchers who formally participate in the MSGCP and hold a Permit. Many of the CPs contained within the Best Management Practices for the Covered Activities are commonly utilized by much of the agricultural community within the Plan Area as a normal course of their farm and ranch operation. Monitoring, as part of the AMMP, will include the contributions of Best Management Practices on impact minimization and mitigation from both formally-involved Permittees, and non-permittee landowners by using a landscape level perspective. The ultimate goal of the MSGCP is to result in a year-to-year increase in the habitat values of the Plan Area for the Covered Species, whether by formal participation or by education, outreach, and cooperation with non-formally involved landowners.

AMMP: Goals and Objectives

Adaptive management can be defined as a flexible, iterative approach to long-term management of biological resources that is directed over time by the results of ongoing monitoring activities and other information. This means that biological management techniques and specific objectives are regularly evaluated in light of monitoring results and new information on species needs, land use, and a variety of other factors. These periodic evaluations are used over time to adapt both management objectives and techniques to better achieve overall management goals as defined by measurable biological objectives. The goals of the MSGCP AMMP are to ensure

compliance with and assess the results and effectiveness of the BMPs for the Covered Activities while encouraging innovative approaches to their implementation.

The AMMP is designed to meet the following objectives:

1. Ensure that the MSGCP BMPs described in Farm Plans and GCP Site Plans are followed and implemented by Permittees as designed.
2. Monitor and assess the effects of BMP implementation on habitat quality and on the Covered Species and ensure that they are effective in meeting their goals and quality criteria.
3. Monitor the long-term net habitat value of the habitats that currently, or have the potential to, support Covered Species on privately owned and/or operated agricultural lands in the Plan Area.
4. Provide feedback and recommendations to guide the adaptive-management response process.

AMMP: BMP Monitoring and Evaluation

Key elements of the AMMP include monitoring, analysis, and potential modification of specific BMPs to increase their effectiveness and benefits. Monitoring is intended to provide answers to the following questions:

1. Are the MSGCP farm-level BMPs being implemented on-farm as expected in Farm Plans/GCP Site Plans and by the IM Committee? Implementation monitoring assesses the Permittee's proper implementation of the BMPs.
2. Are the MSGCP Farm-Plan BMPs effective, i.e., are the shrub-steppe, grassland, riparian, and wetland habitats improving or being maintained as expected by the MSGCP? Effectiveness monitoring includes measures focused on assessing the effects of BMPs at both the Plan Area (landscape level) and farm level.
3. Are habitat levels for Covered Species meeting those predicted in the MSGCP? Changes in the monitoring structure may be made, if necessary, to meet monitoring objectives.
4. Have innovative practices been developed by farm operators to support movement of their operations towards the MSGCP's Desired Future Conditions? Adaptive implementation of many of the BMPs may include appropriate BMP modifications as information becomes available through monitoring, or other agricultural or habitat research. Incorporation of potential changes in BMP design, management, and operations can be made in response to monitoring results. It is recognized that effects monitoring may require many years to assess success/failure of a given BMP in our arid climate.

Monitoring measures in the MSGCP include:

1. *Farm-level BMP Effectiveness Monitoring*: Evaluation of the on-site effects of the specific BMPs on habitat quality and quantity on individual agricultural operations to ensure they meet quality criteria.
2. *Farm-level BMP Implementation Monitoring*: Monitoring of the individual BMPs in Farm Plans and GCP Site Plans.
3. *Landscape-level BMP Effectiveness Monitoring*: Evaluation of the cumulative effects of the BMPs on the habitat conditions within the overall Plan Area (See Glossary Section for definition of cumulative effects).
4. *Habitat Suitability Model Analyses*: Through remote sensing and GIS technology, monitor habitat-condition dynamics using the HSI model for the Covered Species.
5. *Covered Species Population Monitoring*: Monitoring Covered Species populations by estimating their habitats quantities or HSI-Acres over the Plan Area as well as coordinating with agencies conducting on-the-ground population monitoring.
6. *Changed Circumstances Monitoring*: Assess the impacts of changed circumstances on habitat quality and quantity over the Plan Area.

AMMP: Monitoring and Evaluation Measures

Specific AMMP measures, criteria, and potential responses are listed in Table 4-5. Following the table is a more detailed discussion of each measure.

Table 4-5: Summary of Implementation and Adaptive Management Monitoring and Evaluation Measures for the Douglas County MSGCP

AMMP Measure Number	Measure Title	Monitoring Frequency	Monitoring Type/ Responsible Party	Reporting Process	Quality Criteria to Be Met	Management Response If Not Met
1	Farm Level BMP Implementation Monitoring	Annual	Self-reporting and record-keeping of compliance—Permittees Conduct compliance spot checks annually or more frequently and audits for BMP implementation on dryland farm operations, non-farmland shrub-steppe and other rangelands, and on irrigated croplands—FCCD and/or USFWS	Annual Reports developed by FCCD and submitted to the USFWS by FCCD Plan Administrator.	Permittee is implementing farm plan/site plan as expected.	Provide written reminders to Permittees if needed to ensure compliance—FCCD and/or USFWS. After review of situation, Service may revoke permit if Permittee not following expectations in farm plan/site plan and permit.
2	Farm-level BMP Effectiveness Monitoring: Soil Erosion	Annual	Dryland: photo monitoring—by Permittee Residue monitoring after each crop rotation on each farm—FCCD and Permittee	Reports submitted to the FCCD by enrolled Permittees. IM committee contributes. FCCD Plan Administrator develops report.	Soil-protection measures for wind and water erosion on dryland croplands area meeting expectations.	Re-evaluate soil-protection measures and field operations to minimize soil-erosion hazards by next growing season.

AMMP Measure Number	Measure Title	Monitoring Frequency	Monitoring Type/ Responsible Party	Reporting Process	Quality Criteria to Be Met	Management Response If Not Met
2	Farm-level BMP Effectiveness Monitoring: Rangeland Vegetative Quantity and Quality	Annual—photo monitoring Biennial—rangeland surveys	Photo monitoring—Permittees Rangeland vegetation survey on enrolled lands and control areas—FCCD	Reports submitted to the FCCD by enrolled Permittees. IM Committee contributes. FCCD Plan Administrator develops report.	Range vegetation measurements indicate improved health and diversity vs. rangelands and pastures without applied BMPs.	Review prescribed grazing plan BMPs and adjust rotation and resting of pastures by next growing season. Adjust farm plan/site plan BMPs as needed based on monitoring.
2	Farm-level BMP Effectiveness Monitoring; Irrigated Agriculture	Annual	Irrigation schedule monitoring—Permittees	Reports submitted to the FCCD by enrolled Permittees. IM Committee contributes. FCCD Plan Administrator develops report.	Irrigation efficiencies, decreased runoff, and excessive percolation vs. control.	Review irrigation scheduling and improve soil-moisture monitoring program by next growing season. Adjust farm plan/site plan BMPs as needed based on monitoring.
2	Farm-level BMP Effectiveness Monitoring	5-year point	Collect data using NRCS certification protocols and compare to controls—FCCD and Permittee	FCCD will summarize previous annual and biennial reports to determine trends.	BMPs are meeting expectations and benefitting covered species.	Develop recommendations to modify BMPs to improve farm-level effectiveness as needed based on monitoring.

AMMP Measure Number	Measure Title	Monitoring Frequency	Monitoring Type/ Responsible Party	Reporting Process	Quality Criteria to Be Met	Management Response If Not Met
3	Landscape-level BMP Effectiveness Monitoring: Cumulative Effects of BMPs on Habitat Quality and Quantity Monitoring	Annual	Photo monitoring at a suite of control points across Plan Area CRP/SAFE and other dryland crop lands—FCCD	Reports submitted to the USFWS by FCCD Plan Administrator.	BMPs are contributing to positive cumulative effects on Covered Species habitat on CRP/SAFE and dryland croplands within the Plan Area.	FCCD and USFWS re-evaluate the BMPs. Potentially implement alternative BMPs as needed based on monitoring.
3	Landscape-level BMP Effectiveness Monitoring: Cumulative Effects of BMPs on Habitat Quality and Quantity Monitoring	Biennial	Rangeland vegetation surveys on suite of control plots across non-cropland shrub-steppe—FCCD	IM committee submits reports to the FCCD. FCCD Plan Administrator develops report.	BMPs are contributing to positive cumulative effects on Covered Species habitat on non-cropland shrub-steppe and other range communities within the Plan Area.	FCCD and USFWS re-evaluate the BMPs. Potentially implement alternative BMPs as needed based on monitoring..
3	Landscape-level BMP Effectiveness Monitoring: Cumulative Effects of BMPs on Habitat Quality and Quantity Monitoring	Biennial	Monitoring of downstream non-crop vegetation response to irrigation practices on suite of control plots across non-cropland shrub-steppe—FCCD	IM committee submits reports to the FCCD. FCCD Plan Administrator Develops report.	BMPs are contributing to positive cumulative effects on Covered Species habitat on irrigated cropland within the Plan Area.	FCCD and USFWS re-evaluate the BMPs. Potentially implement alternative BMPs as needed based on monitoring.

AMMP Measure Number	Measure Title	Monitoring Frequency	Monitoring Type/ Responsible Party	Reporting Process	Quality Criteria to Be Met	Management Response If Not Met
3	Landscape-level BMP Effectiveness Monitoring: Cumulative Effects of BMPs on Habitat Quality and Quantity Monitoring	Annual	Evaluate status of Plan Area lands due to loss of habitat from development or conversion activities—FCCD	Reports to USFWS by FCCD Plan Administrator.	Compare total acres to trigger points in changed circumstances section.	Evaluate whether any changed circumstances are triggered, and refer to actions in changed circumstances section.
3	Landscape-level BMP Effectiveness Monitoring: Cumulative Effects of BMPs on Habitat Quality and Quantity Monitoring	At year 5 and then at 5-year increments	Evaluate whether BMPs should be revised.	FCCD Plan Administrator coordinates with IM Committee to develop report. Report is submitted to USFWS.	Over 5-year review period, BMPs are contributing to positive cumulative effects on Covered Species habitat.	Revise farm plans/site plans as appropriate.
4	Covered Species Monitoring	Annual	Monitor species present at selected control points in CRP/SAFE and dryland croplands— Permittees, FCCD, IM Committee (FCCD will coordinate with local, State, and Federal agencies as well as non-governmental organizations to collate their monitoring results.)	Annual reports developed by FCCD and submitted to the USFWS and WDFW by FCCD Plan Administrator.	Habitats of Covered Species are decreasing, maintaining constancy, or increasing as projected in the MSGCP.	Evaluate whether any changed circumstances are triggered. Where Covered Species populations are not within MSGCP predictions, evaluate potential reasons and evaluate whether BMPs need to be discontinued or modified.

AMMP Measure Number	Measure Title	Monitoring Frequency	Monitoring Type/ Responsible Party	Reporting Process	Quality Criteria to Be Met	Management Response If Not Met
4	Covered Species Monitoring	Ongoing	During other monitoring efforts and farming activities, note covered species sightings locations and habitats used—Permittees and FCCD	Annual Reports developed by FCCD and submitted to the USFWS and WDFW by FCCD Plan Administrator.	Do covered species continue to occur in locations and at numbers expected?	Where Covered Species populations or distributions are not within MSGCP guidelines, re-evaluate BMPs and discontinue or modify as necessary.
5	Changed Circumstances Monitoring	Annual	Maintain and review annual records of normal and abnormal climatic or other natural process events, including crop or livestock pricing that may affect the habitat conditions on CRP, SAFE, and dry croplands. Maintain adequate historical records of climatic and natural processes occurring on CRP/SAFE and dryland cropland as well as crop or livestock market conditions to understand the possible effects of changed —FCCD	Reports submitted to the FCCD Board and USFWS by FCCD Plan Administrator.	Do natural processes meet or exceed any changed circumstances criteria?	Evaluate whether any changed circumstances are triggered. Should changed circumstances arise, modify BMPs and MSGCP as needed to continue to support project objectives.
5	Changed Circumstances Monitoring	Annual	Evaluate changes to acres of CRP, SAFE, or similar protected status lands—FCCD	Annual Reports developed by FCCD and submitted to the USFWS by FCCD Plan Administrator.	Change in conservation contract acres decreases by more than 10% of the starting point.	Evaluate whether any changed circumstances are triggered.
5	Changed Circumstances Monitoring	Annual	Evaluate changes to acres of HCAs in Plan Area—FCCD	Reports developed by FCCD and submitted to the USFWS by FCCD Plan Administrator.	Change in HCA acres decreases by more than 10% of the starting point.	Evaluate whether any changed circumstances are triggered.

AMMP Measure Number	Measure Title	Monitoring Frequency	Monitoring Type/ Responsible Party	Reporting Process	Quality Criteria to Be Met	Management Response If Not Met
Measure 6	Habitat Suitability Index Modeling	Initially, then every 5 years, or sooner if habitat or other changes indicate need	Monitor through remote sensing analyses and monitoring at the landscape level habitat conditions County-wide (spring or summer satellite scenes—FCCD and WDFW Evaluate HSI model and habitat trends—FCCD	Report coordinated with IM Committee by FCCD Plan Administrator with reviewed reports being forwarded to FCCD Board and the USFWS.	Habitat quality is being improved on private land. Habitat and landscape trends are being met as expected in the GCP.	Determine appropriateness of HSI model to evaluate habitat and species trends; revisit model if needed. If habitat and species trends are not improving as expected, evaluate whether BMPs or farm plans/site plans need changing. Evaluate whether any changed circumstances are triggered and refer to actions in changed circumstances section. Evaluate whether habitat values can be increased elsewhere to make up for habitat quality or quantity losses.

Measure 1 – Farm Level Best Management Practice Implementation Monitoring

The FCCD will monitor the timing and spatial distribution of BMPs that have been initiated as well as continued in practice across Douglas County. Audits will be conducted annually to verify the implementation and continued practice of the MSGCP BMPs. The District will prepare an annual report for the IM Committee describing the implementation level of BMPs. In turn, this report (following IM Committee review) will be submitted to the FCCD Board and with approval by the Board forwarded to the USFWS.

Questions Addressed by Measure 1

1. Are BMPs identified, located, and implemented on Permittee's enrolled lands?
2. If the BMPs are part of a progressive Farm Plan/GCP site plan (implemented over time), are the practices being installed according to the schedule?
3. Are any scheduled BMPs not fully implemented and if not why?

Rationale for Measure 1

Best Management Practices provide the foundation for improving the quality and quantity of habitat, and hopefully healthy populations, for Covered Species in Douglas County.

Possible Responses for Measure 1

1. If BMPs are not being followed, FCCD or Service will provide written reminders to Permittees if needed to ensure compliance.
2. Depending on response to reminders, Service may revoke Permits if Permittees not following Farm Plans/GCP Site Plans as expected.

Tools and Methodologies for Implementing Measure 1

The following administrative monitoring tools and methods will be used for implementing Measure 5 as appropriate. All records of this BMP compliance/implementation monitoring will be compiled and analyzed by the FCCD Plan Administrator.

1. FCCD/NRCS RMS Plan Status Reviews
2. Landowner Self-Reporting on Implemented Practices
3. Spot checks and audits by FCCD or USFWS

Measure 2 – Farm Level BMP Effectiveness Monitoring.

The FCCD will continue to monitor the local effects of Best Management Practices on agricultural lands enrolled in the MSGCP. Monitoring an adequately representative set of lands enrolled in the MSGCP within the first five years of MSGCP implementation will create an initial block of data to assess the effectiveness of the BMPs. Measurements will be collected and compared to controls using accepted NRCS certification protocols.

Reports from the IM committee or other sources will be developed and summarized for review by the FCCD Board of Supervisors. Analysis of the data will be ongoing with an annual report delivered to the USFWS.

Questions Addressed by Measure 2

1. Are soil erosion measures meeting expectations?
2. Is the vegetative quantity and quality improving compared to rangelands and pastures without applied BMPs?
3. Are the irrigation-efficiency measures reducing water usage while meeting crop needs?
4. Are the enrolled lands of Douglas County moving towards improved habitat quality and/or quantity as expected in the MSGCP?

Rationale for Measure 2

Local monitoring of fields and parcels enrolled in the MSGCP will be required to assess the benefits of the MSGCP's best management practices on minimizing impacts to the Covered Species. Given that the effects of the BMPs may not be measurable immediately, Measure 1 will initially gather data for five years following the enrollment of the field into the MSGCP, but not immediately recommend any adaptations to the BMPs (see Measure 2).

Possible Adaptive Management Responses for Measure 2

1. Adjust current BMPs and Farm Plans/GCP Site Plans to reduce soil loss, such as changing BMPs to provide increased levels of crop residue.
2. On pastures not demonstrating measurable improvements of vegetation quantity and quality, reduce grazing utilization through measures such as decreased herd size, improved rotation, or distribution changes through strategic use of salt or water, etc.
3. Install more-comprehensive, soil-moisture monitoring methods to improve irrigation scheduling.

Tools and Methodologies for Implementing Measure 2

The following types of monitoring tools and methods will be used for implementing Measure 1 as appropriate in each of the three land-use categories:

1. Dryland Agriculture
    a. Determine changes in soil-erosion rates (NRCS Revised Universal Soil Loss Equation 2 – RUSEL2).
    b. Determine changes in soil quality (NRCS Soil Condition Index).
    c. Conduct photo monitoring of land-use fragments and projects.
2. Rangeland
    a. Conduct photo monitoring of rangelands and riparian areas.
    b. Employ Conservation Security Program Self Evaluation Protocols.

c. Conduct Range Condition Surveys biennially.

3. Irrigated Agriculture
    a. Conduct annual photo monitoring of non-crop areas such as riparian habitat areas focusing especially on downstream habitats.
    b. Review annual water-use records.
4. Controls
    a. Farm-level controls with no implemented BMPs will be identified where available.
    b. Regional habitat control areas with no implemented BMPs will be established.

Measure 3 – Landscape-level BMP Effectiveness Monitoring: Cumulative Effects of BMPs on Habitat Quality and Quantity Monitoring.

FCCD will initiate and continue to monitor the cumulative effects of past, current, and future results of implemented BMPs on the quantity and quality of Covered Species habitat located on MSGCP enrolled lands in Douglas County using sampling and remote sensing. Long-term plots will be established for monitoring that will provide a statistically viable database for future interpretations of habitat-condition trends. Measurements on the long-term plots will be collected and processed using accepted NRCS certification protocols. FCCD will share data-analysis reports with the IM committee for their review. In turn, the IM committee will submit status reports on habitat condition to the FCCD, which will then provide an annual habitat-status report to the USFWS. It is a goal of the MSGCP to improve habitat quality and quantity but it is recognized that this may not directly translate into increases in Covered Species populations.

Analysis of the effectiveness of BMPs will be ongoing over the initial five year time-period, but due to the significant time-frame of the cause and effect loop, BMPs must be given sufficient time to demonstrate their success (or failure). Only after a sufficient period of time (approximately five years or longer), should modifications be recommended to a specific BMP or a Farm Plan/GCP Site Plan on either a Plan Area scale or a specific land-area level. In the event of extreme events (i.e. extreme drought), modifications may be recommended before the end of the initial 5-year period.

Questions Addressed by Measure 3

1. What BMPs are contributing to positive, negative, or no cumulative effects on Covered Species habitat on CRP/SAFE and dryland cropland within the Plan Area?
2. What BMPs are contributing to positive, negative, or no cumulative effects on Covered Species habitat on non-cropland shrub-steppe and other rangelands within the Plan Area?
3. What BMPs are contributing to positive, negative, or no cumulative effects on Covered Species habitat on irrigated and downstream croplands within the Plan Area?
4. Where has habitat been lost due to development or conversion activities and how does this affect Covered Species habitat?

5. At year 5 analysis point, should BMPs be added or changed, and should Farm Plans/GCP Site Plans be modified?

Rationale for Measure 3

One BMP implemented annually by itself may or may not have an effect on habitats of Covered Species. However, that BMP in combination with other BMPs and past practices, as applied over an extended time may have either a positive, beneficial, or a negative effect on habitat. Monitoring activities and the analysis of extended-period data often provides insight into the cumulative effects on habitat by actions taken as suggested in the MSGCP. Monitoring can be particularly effective in determining whether a given BMP is useful and where more investment in that measure should be undertaken.

Possible Adaptive Management Responses for Measure 3

1. Where implemented long-term BMPs are contributing to improved habitat quality and quantity for Covered Species, additional support can be invested to support desired practices.
2. In turn, where implemented long-term BMPs are not contributing to habitat quality and quantity for Covered Species, these practices may be discontinued, modified, or replaced so that habitat quality and quantity is improved.
3. Add or change BMPs and Farm Plans/GCP Site Plans if necessary to meet habitat quality and quantity expectations.

Tools and Methodologies for Implementing Measure 3

The following types of monitoring tools and methods for spatial analysis will be used for implementing Measure 2 as appropriate in each of the three levels of cumulative-effects monitoring (enrolled lands, control point, and landscape):

1. Enrolled-Lands Monitoring.
    a. Determine and map spatial relationship of enrolled lands.
    b. Determine what changes in land-use have occurred on enrolled lands.
    c. Determine what BMPs have been installed and their locations.
2. Countywide Ground-Truth/Control-Point Monitoring.
    a. Conduct NRCS resource inventories.
    b. Continue countywide agency(s) monitoring.
    c. Utilize The Nature Conservancy/Agency habitat monitoring sites.
3. Landscape Remote-sensing Monitoring.
    a. Evaluate countywide quantities of CRP/SAFE acres and HCA acres annually. Determine other temporal and spatial land-use changes every 3-5 years.
    b. Determine countywide habitat changes in terms of quantity and quality.
    c. Conduct trend analyses.

Measure 4 – Landscape-Level Covered Species Monitoring

While the monitoring of habitat conditions (as included in other Measures) provides an indication of what might be happening to the population dynamics of Covered Species in Douglas County, direct population monitoring is a more-effective though difficult method of determining the outcome of BMPs initiated under the MSGCP. FCCD will not be directly conducting species monitoring as part of the MSGCP. However, FCCD will coordinate with local, State, and Federal agencies as well as non-governmental organizations to collate their monitoring results for inclusion in scheduled reports and will relate and incorporate the species information with the habitat analysis and HSI model (See Measure 6). FCCD will provide reports of this information to the USFWS.

Questions Addressed by Measure 4

1. Are MSGCP habitat and species dynamics expectations and assumptions, including the HSI model, correct?
2. What habitats and locations are Covered Species using?
3. What will be the possible total effect of the implementation of the MSGCP on Covered Species populations of Douglas County?
4. Are the non-urban lands of Douglas County moving towards improved habitat quality that supports Covered-Species populations identified in the MSGCP?

Rationale for Measure 4

Direct measurements of Covered Species populations or individuals by other agencies or entities are expected to provide estimates of the effectiveness of the MSGCP. Through coordination with the IM Committee, the FCCD Manager will use this information to evaluate the MSGCP and modeling expectations and share this information with the USFWS. However, providing BMPs and better habitat does not always result in increased abundance and diversity of wildlife species. Other external factors, such as increased predator populations or disease, may have a greater impact on wildlife species populations than BMPs. Nonetheless, the aspect of Covered Species management that the FCCD has control over, through the MSGCP and Permittees, is improving habitat.

Possible Adaptive Management Responses for Measure 4

1. Where Covered Species populations are within MSGCP guidelines, continue support of MSGCP.
2. Where Covered Species populations or distributions based on habitat modeling are not within MSGCP expectations, assess potential causes for this with full consideration of "external factors," then re-evaluate BMPs and discontinue, modify, or replace as necessary in Farm Plans/GCP Site Plans.

Tools and Methodologies for Implementing Measure 4

The following species population-monitoring tools and methods will be used for implementing Measure 3 as appropriate in each of four forms of monitoring:

1. Agency Monitoring (see expectations of IM Committee and in the MOU, Appendix A)
    a. Continue direct species-specific population estimates—primarily WDFW.
    b. Continue species-dynamics modeling—primarily WDFW.
    c. Continue species-use monitoring of CRP/SAFE lands—primarily WDFW.
2. Citizen Monitoring
    a. Encourage annual Audubon Society bird counts.
    b. Encourage The Nature Conservancy Surveys at the McCartney Creek Center or on other parcels.
    c. Establish landowner protocols to report Covered Species sightings.
    d. Encourage other programs such as school science monitoring projects, etc.
    e. Permittee Surveys and Covered Species sighting data.
    f. Use USDA Conservation Security Program Species of Concern surveys.
    g. Recording observations on Covered Species populations and locations.
    h. Photo-monitoring points.
3. Habitat Suitability Modeling
    a. Use of Habitat Suitability Index modeling and possible derivatives by FCCD
    b. Use survey-input data from Measure 2

Measure 5 – Changed Circumstances Monitoring

While this measure addresses monitoring relevant to changed circumstances or Unforeseen Circumstances, more detail on commitments and expectations regarding changed circumstances, Unforeseen Circumstances, and no surprises follows this section. The FCCD will provide limited monitoring of the external environment including landscapes and habitat changes that may affect the outcome of the MSGCP over the expected 50-year lifetime. Key external factors to be followed include climatic change, predator dynamics, government policies such as CRP/SAFE, and pricing of key commodities such as small grains, livestock, and other crops. Annual reports will be completed by FCCD and submitted to the IM Committee for review. FCCD will then provide an annual status report to the USFWS (sooner if the issue becomes known) indicating possible changed circumstances as they may relate to the success of the MSGCP.

Questions Addressed by Measure 5

1. Are external factors such as climate conditions, predator levels, invasive weeds/species, or wildland fire within the range of expectations under which the MSGCP has been developed?
2. Does the MSGCP need to be modified significantly to meet expectations because of the effects of changed conditions?

3. Are reserved land (CRP/SAFE or similar lands) or protected lands (HCA) quantities different than expected under the MSGCP, and do the quantities require addressing per the changed circumstances expectations?

Rationale for Measure 5

The FCCD will provide limited monitoring of the external environment in addition to monitoring habitat conditions and population dynamics of Covered Species. The most prevalent changed circumstance is that terrestrial ecosystems are dynamic and experience constant change. The changes may be subtle or they may be of such large magnitude they become Unforeseen Circumstances markedly affecting the dynamics of both habitat and populations.

Possible Adaptive Management Responses for Measure 5

Responses are described in detail beginning on page 106.

Tools and Methodologies for Implementing Measure 5

The following administrative monitoring tools and methods will be used for implementing Measure 4 as appropriate in three sectors of monitoring. All records of this monitoring will be compiled and analyzed by the FCCD Plan Administrator.

1. Permittee Reports
2. Private Sector Commodity Group(s) Reports
3. Federal and State Agency Reports
4. Weather data
5. County land-use and ownership data
6. County-wide landscape analyses

Measure 6 – Landscape Level Habitat Suitability Index Modeling

The FCCD will monitor countywide habitat conditions at the landscape level for Covered Species initially, and then every 5 years (or sooner if habitat or other trends indicate need) using remote sensing and GIS technologies. Digital maps of both existing habitat conditions and changes among seasons and years will be prepared for analyses. These analyses will be entered into a report by the FCCD. The FCCD will prepare an annual report for the IM Committee describing the landscape-level habitat monitoring activities. This report (following IM Committee review) will be submitted for approval by the FCCD Board. FCCD will coordinate with local, State, and Federal agencies, as well as non-governmental organizations, to collate their monitoring results, which will be included in scheduled reports and will relate and incorporate the species information with the habitat analysis and HSI model. FCCD will continue to conduct HSI-Acre analysis of the habitats within the Plan Area. FCCD will provide reports of this information to the USFWS.

Questions Addressed by Measure 6

1. What is the existing spatial landscape distribution of habitat by quality and quantity levels for the Covered Species?
2. What landscape-level changes are occurring in the spatial distribution of habitat among seasons and years for the Covered Species?
3. Are Countywide changes in levels of habitat prescribed for the Covered Species being achieved by implementation of the MSGCP?
4. Are the enrolled private lands and other lands in Douglas County moving toward habitat quality improvement as expected in the MSGCP?
5. Is the HSI model helpful in answering these questions?

Rationale for Measure 6

An initial habitat-distribution map (see Figure 2-6) has been developed for the MSGCP program. However, the map product does not display the landscape-level dynamic conditions that are occurring in Douglas County. Thus, spatial models will be used to identify habitat of several levels of quality. The distribution of these habitat-quality parameters will be monitored and recorded through the use of satellite and/or aerial imagery.

The output product of this monitoring will be digital maps that display the existing conditions at any point in time and changes that have occurred across season and years. A continuous record of changes in habitat conditions brought about by the MSGCP and other external environmental factors are recorded and available to support future adaptive management decisions. In addition, the use of remote-sensing and GIS technologies in Measure 6 provide validation support data for Measure 1 through 4.

Possible Adaptive Management Responses for Measure 6

1. Using knowledge gained from landscape-level analyses, assess the effectiveness of BMPs in moving the habitat suitability indexes towards MSGCP-prescribed levels.
2. Assess possible changes in Covered Species populations that may have been affected by landscape-level dynamics of non-habitat or other external environmental factors rather than implemented BMPs.
3. Discontinuation, modification, or addition of new BMPs to the MSGCP for implementation, through modified Farm Plans/GCP Site Plans to address loss of habitat quality or quantity.
4. Evaluation of growing conditions and habitats as expected in Changed Circumstances #2.
5. Discontinuation, modification, or addition of a new landscape-level analysis that is comparable to the initial analysis.

Tools and Methodologies for Implementing Measure 6

The following sources of data will be used to develop a baseline landscape-level evaluation of existing land-use conditions within the Plan Area. This baseline evaluation will provide the format for monitoring future changes in land use and habitat quality at the landscape level within the Plan Area during its implementation

1. Existing GIS Data
    a. Agency Data – NRCS, BLM, Douglas County, WDFW, WDNR
    b. Non-governmental organizations - TNC
2. Existing Agency Monitoring data
    a. NRCS soil-loss data
    b. WDFW or other species surveys
    c. WDNR surveys
    d. Non-governmental organization surveys
3. Available Imagery Data
    a. Governmental Agencies – NRCS, USGS, NASA Data Centers
    b. Private Source – Space Imaging Company
    c. Private Source – Aerial Imaging
    d. HSI model, or other model with similar function and comparable results

Implementation of the Adaptive Management and Monitoring Plan may result in need for changes to Farm Plans/GCP Site Plans. The Service will be notified and must approve changes to the MSGCP, Farm Plans, GCP Site Plans, or Permits as a result of the AMMP. Most changes to Farm Plans/ GCP Site Plans will not require a modification to the Permit. ~~Farm~~ Plans and Permits will be adjusted as needed to meet expectations of AMMP and changed circumstances.

AMMP Annual Report

An annual report will be provided to the USFWS. The FCCD, as administrators of the AMMP, will provide an annual report to the IM Committee to assist as it prepares plans and budgets for the following biennium. The FCCD and the IM Committee will meet annually or as needed to review the AMMP report and other information. These discussions will inform land managers as to the appropriate focus as they prepare budget proposals.

During the first two years of MSGCP implementation, the IM Committee and the AMMP will focus on the following significant areas:

1. Development and analysis of the GIS database and modeling efforts for the Plan Area.
2. Evaluation of the status of Covered Species and their habitats.
3. Evaluation of means to enhance cost-effectiveness of existing species and habitat-management actions.

By their nature, adaptive management strategies must be adaptive. They must reflect issues of concern to the FCCD, Permittees, or USFWS and assist them in answering management-related questions. In the future, the IM Committee may recommend specific actions for improving conservation goals and priorities, based on input from the agencies and constituent members. FCCD's biennial work plan for the AMMP will be developed in cooperation with the IM Committee and recommended for approval by the FCCDs' Board of Supervisors. Conservation measures undertaken pursuant to the AMMP will be processed and approved by the USFWS and the Districts' Board of Supervisors in connection with the review and approval of the biennial implementation plan and budget, and/or through revisions of Farm Plans/GCP Site Plans.

Research and Continuing Education

Continued Research on Covered Species

The population levels and habitat use of Covered Species is not completely known in in Douglas County. The FCCD will work with the USFWS, WDFW, and other management agencies to support additional research on the Covered Species. In addition, research will be conducted to support the Adaptive Management Plan by determining the effectiveness of Covered Activities and BMPs to promote the protection and enhancement of Covered Species and their habitats.

Continuing Education Forum to Support MSGCP Permittees

The FCCD and the IM Committee, with possible technical assistance from other agencies, will implement workshops as necessary for Permittees and other interested publics to implement monitoring and assess the effectiveness of the planned Covered Activities, BMPs, and AMMP.

Federal Commitments and Assurances Regarding Changed and Unforeseen Circumstances and the Federal No Surprises Regulation

USFWS regulations provide that once an incidental take permit has been issued, and so long as the associated HCP (in this case the MSGCP) is being properly implemented, the USFWS shall not require the commitment of additional conservation or mitigation measures by the Permittee (including additional land, water, or financial contribution, or additional restrictions on the use of land, water, or other natural resources) beyond the level provided in the HCP, without the Permittee's consent (50 CFR 17.22, 17.32). To implement these assurances, an HCP must identify and analyze reasonably foreseeable "Changed Circumstances" that could affect a species or geographic area during its term. Should such a Changed Circumstance occur, the Permittee is required to implement the measures specified in the HCP to respond to such change. In contrast, "Unforeseen Circumstances" are events affecting a species or geographic area covered by the HCP that could not reasonably have been anticipated by the applicant or USFWS during the development of the HCP and that result in a substantial and adverse change in the status of a Covered Species. If an Unforeseen Circumstance occurs during the term of the HCP, and if the USFWS determines that additional conservation and mitigation measures are deemed necessary

to respond to such Unforeseen Circumstances, then the USFWS may require more conservation measures of the Permittee, but only if such measures are limited to modifications within conserved habitat areas, if any, or to the HCP's operating conservation program for the affected species, and if such measures maintain the original terms of the HCP to the maximum extent possible (50 CFR 17.22).

Changed Circumstances

FCCD and the USFWS shall cooperate to resolve adverse impacts in accordance with this section should Changed or Unforeseen Circumstances occur. Changed circumstances are defined in the Federal No Surprises Regulation (50 C.F.R. 17.22(b)(5)(ii)) as "those circumstances affecting a species or geographic area covered by the HCP that can be reasonably anticipated by the Permittee or Federal wildlife agencies and that can be planned for." Accordingly, these regulations require that potential changed circumstances be identified in the MSGCP along with remedial measures that would be taken to address these changes. Changed circumstances that could arise in the Covered Area have been identified and are described below.

#1. Conversion of CRP or other Conservation Habitat to Farming if Conservation Contracts (CRP, SAFE, or other similar programs) Reduced or Not Renewed Due to Program Changes

Most natural shrub-steppe that is likely to be converted has already been converted. As described in Appendix E, Permittees commit to maintain remnant patches of natural shrub-steppe.

Appendix E also describes that if CRP/SAFE or other conservation contracts cannot be maintained due to program changes, the Permittee will enroll the land into other Farm Bill programs such as the Grassland Reserve Program (GRP), Agriculture Conservation Easement Program (ACEP), or other Federal, State, or other similar programs if available. If the other similar programs are not available, and the Permittee still needs to convert the conservation acres for economic reasons, then the Changed Circumstances will be evaluated.

Evidence: Notification from Federal agencies; monitoring of distribution and quantity CRP/SAFE and other conservation acres in the County.

Response: Farmers not enrolled in the MSGCP would be encouraged, through education and outreach by FCCD, to pursue additional BMPs elsewhere on their lands to compensate for the loss of habitat values (HSI acres). Acquisitions or easements that result in improved habitat or long-term protection on Permittees' or others lands may be considered as compensation for loss of habitat or acres. FCCD will monitor to determine if there is a decrease of 10 percent or more of conservation contract acres or similarly protected acres (approximate starting point of 119,072 acres enrolled in CRP/SAFE and 63,000 acres in SAFE for a total of 182,072 acres), and whether additional acres to get above the 10 percent trigger can be implemented within 2 years. If conservation acres cannot be obtained to get above the trigger, then the USFWS must revisit the

MSGCP to determine if it still meets S10 issuance criteria, and if not, how and whether it can be revised. At that point, an analysis of loss and gain of HSI-acre values will be considered, and if acre quantities or HSI-acre qualities cannot be regained to meet the starting point, permits may be revoked.

Detailed Discussion: The FCCD Plan Administrator would notify the USFWS of a change greater than 10 percent of conservation coverage acreage in Douglas County. FCCD, with assistance from the IM Committee, will monitor and analyze the acreage changes to conservation programs by coordination with USDA agencies, remote sensing, direct observation, and/or reporting by Permittees. The analysis will determine the habitat values (HSI acres) being lost and recommend to the IM committee and USFWS methods and alternatives to regain lost habitat values. The Plan Administrator would assess the impact caused by the loss of conservation cover and initiate the following actions:

1. Prepare an assessment report.
2. Consult with program agencies to determine if modifications to existing conservation programs or the addition of new programs can occur to mitigate for Plan Area habitat losses.
3. Evaluate how or whether mitigation of lost habitat values can be addressed through changes to other Farm Plans/GCP Site Plans, or if other conservation efforts in the county will adjust for lost habitat values.
4. Within 2 years obtain or implement additional conservation acres to keep acres above the 10-percent trigger. If above not met, contact USFWS to revisit consistency with issuance criteria. See additional discussion under #2 Response below.

#2. Poor Growing Conditions for Rangeland/Pastureland/Shrub-Steppe Due to Unseasonable Weather, Climatic Drought, or Climate Change

Evidence: Lower than expected plant growth or lower than expected native habitat quality.

Response: At 10-year increments or when a drought, as defined below, is identified, review implemented conservation practices to ensure grazing plans are allowing for target residue levels by modification of the rest/deferral schedule and stocking rates.

Develop and implement BMPs through modified Farm Plans/GCP Site Plans that ensure long-term productivity of fields, pastures, and natural habitats. This may involve providing artificial water sources for Covered Species or rotation of grazing and haying, native plantings, etc.

Review expected habitat quality and quantity per the HSI model or other similar and comparable model. If MSGCP expectations are not being met and cannot be mitigated through additional habitat quantity or quality protections, then the USFWS must revisit whether the MSGCP still meets issuance criteria, and if not, how and whether it can be revised, or whether Permits must be revoked.

Detailed Discussion: Poor growing conditions for rangeland/pastureland due to unseasonable weather, drought, or climate change may cause lower than expected plant growth, or lower than expected native habitat quality. At 10-year increments review implemented conservation practices to ensure grazing plans are allowing for target residue levels by modification of the rest/deferral schedule. Develop and implement BMPs through modification of Farm Plans/GCP Site Plans that ensure long-term productivity of fields, pastures, and natural habitats. This may involve providing artificial water sources for Covered Species, rotation of grazing or haying, native plantings, etc. For the purpose of defining Changed Circumstances, poor growing conditions are defined as drought up to three years in length. Drought is a cyclical weather phenomenon that is beyond human control. Drought is not uncommon in Douglas County, and it is a phenomenon to which local natural communities and species have adapted over time. Drought occurs slowly over a multi-year period, differing from the catastrophic events of fire and flood, which occur rapidly and afford little time for preparing for disaster response. Drought conditions may adversely affect Covered Species if the species and/or natural communities are unable to adapt to the challenging conditions. Measures will be taken to monitor the effects of drought, as defined above, on Covered Species.

Climate change may result in other unusual or unseasonable weather patterns, not all of which may be predictable. Some of those weather patterns, similar to drought, may result in lower than expected crop plant growth or native habitat quality decreases.

In the case of a drought, the FCCD Plan Administrator would notify the USFWS of the Changed Circumstances as soon as a drought has been identified. To address other possible climate changes, the FCCD Plan Administrator will initiate a review every ten years. The Plan Administrator would assess the damage or unexpected changes caused by the weather circumstances, and initiate the following actions:

1. Prepare a weather comparison report for time period of concern versus typical averages, a crop damage assessment report, and a habitat assessment report.
2. Recommend actions to ameliorate the effects of the drought or other weather conditions on Covered Species. Such action may include provision of temporary artificial water sources for the benefit of the Covered Species and other wildlife, modifying grazing plans to maintain wildlife forage and cover, implementing native plantings or other habitat manipulations, or support of wildlife agencies with Covered Species capture, movement, or reintroduction efforts. Additional measures may be implemented through the Adaptive Management/Monitoring Plan.
3. Review expected habitat quality and quantity per the HSI model or other similar and comparable model. If MSGCP expectations are not being met and cannot be mitigated through additional habitat quantity or quality protections, then the USFWS must revisit whether the MSGCP still meets issuance criteria, and if not, how and whether it can be revised, or whether Permits must be revoked.

#3. Changes in Agriculture Economic Opportunities

Evidence: New crops are planted which may require different farming methods.

Response: Through AMMP, update Farm Plans/GCP Site Plans with new BMPs as appropriate to provide equivalent or greater protection for Covered Species.

Detailed Discussion: Landowners in the Plan Area are subject to changes in the overall economy. In an effort to capitalize and remain economically competitive, Permittees enrolled in the MSGCP may undertake projects that by themselves are not Covered Activities, but the disturbances to their lands could affect Covered Species. Because these are not Covered Activities, they will not receive any ESA assurances for those activities.

There may be situations where new crops are planted which may require different farming methods. The Permittee will work with FCCD and the USFWS to update or modify the Farm Plan/GCP Site Plan with new BMPs as appropriate to provide equivalent or greater protection for Covered Species.

Associated conversion of habitat would be addressed as in Changed Circumstances #1 above. The FCCD and or Permittee will modify the Farm Plan/GCP Site Plan with new BMPs as appropriate to provide equivalent or greater protection for Covered Species. New agriculture activities that result in effects to Covered Species that are different from those considered in the MSGCP are not a Changed Circumstance, and would need to be addressed through a major amendment if covered.

#4. Wildfire Occurs

Evidence: Loss of vegetation cover in the County of 20,000 acres or more in one calendar year

Response: Modify Permittee grazing plans or Farm Plans/GCP Site Plan and replace lost structural practices (fences, water developments, and salting areas) to allow vegetation recovery. Implement additional control of invasive weed species until native vegetation re-establishes itself. Per the AMMP, FCCD will develop addition BMPs if needed to address habitat restoration after a wildfire. USFWS, FCCD, and/or Permittees will modify Farm Plans/GCP Site Plans to implement BMPs that facilitate native habitat recovery.

Detailed Discussion: Fire potential within the MSGCP area in natural habitat and agricultural grain crops is typically high during the summer months. Baker (2006) presented evidence suggesting that pre-EuroAmerican fire rotations were 100−240 years in Wyoming big sagebrush. Charcoal deposits in lake sediments from a study area in northern Douglas and southern Okanogan counties indicate that between 500 and 1,500 years ago, fires occurred on average every 148 years (range 94−232 years; Scharf 2002). Since Euro-American settlement and the introduction of exotic species, most notable cheatgrass (*Bromus tectorum*), hot, intense fires

occur much more frequently, with as little as 5 years between major fires (Pellant 1996). Shrub-steep habitats are not adapted to such frequents fires, and the shrub component may not recover for decades (PNL 2003).

Total annual fire events of more than 20,000 acres cumulatively that may adversely affect Covered Species and natural communities is a Changed Circumstance. The type of fire event that is defined as a Changed Circumstance is fire in a natural community where the fuel loading has been increased such as by the invasion of exotic plants. A high density of exotic weeds can facilitate wildfires in desert habitats where native vegetation would otherwise be too sparse to carry fires. Such fires can dramatically alter habitats that are not fire tolerant. Landscape-level monitoring would attempt to explore the relationship between areas invaded by exotic plants and historical fire sites. Habitat and natural community-level vegetation monitoring would most likely indicate increased fire risk and fuel-loading potential with an increased exotic plant species richness and abundance.

For specific types of fires that are damaging to biological resources within the Plan Area, the cause of the fire will be reviewed and preventative measures such as the following will be developed.

1. Redesign, reconfigure, and /or review fuel breaks.
2. Work with local fire agencies to improve fire-suppression preparedness by planning control for priority areas.
3. Work with local fire agencies to develop appropriate fire-control strategies to minimize habitat damage.
4. Continue public awareness and education programs on fire prevention.

If a wildfire occurs within the Plan Area as defined above, the FCCD Plan Administrator will notify the USFWS of this Changed Circumstance. The Administrator will assess the damage caused by the fire and initiate the following actions:

1. Develop and implement a monitoring program to monitor natural re-growth within the damaged area for an appropriate period.
2. If it is determined that natural re-growth is not occurring and that such absence of natural re-growth will adversely affect Covered Species, an action plan will be developed and implemented to improve habitat conditions.
3. Implement response measures through the Adaptive Management/Monitoring Plan. Per the AMMP, FCCD will develop additional BMPs if needed to address habitat restoration after a wildfire. USFWS, FCCD, and/or Permittees will modify Farm Plans/GCP Site Plans to implement BMPs that facilitate native habitat recovery.

#5. *Flood Damage to Riparian Areas*

Evidence: Excessive scouring and streambank erosion occurs, beyond existing baseline condition.

Response: For rangelands, modifications to grazing plans or Farm Plans/GCP Site Plans will be made to reduce livestock access to damaged riparian areas. For croplands, installation of NRCS conservation practice buffers to recover buffer function lost to flooding.

Detailed Discussion: Flood damage to riparian areas could be a Changed Circumstance if excessive scouring and streambank erosion occurs over and above baseline conditions. To address this situation in rangelands, the Permittee will modify Farm Plans/GCP Site Plans or grazing plans to reduce livestock access to damaged riparian areas; and in croplands, installation of NRCS conservation practice buffers or other BMPs may be needed to recover buffer function lost to flooding.

#6. Invasion by New Exotic Species or Impacts from Disease

Evidence: Monitoring and research identifies new exotic species in the Plan Area that may have an adverse effect on Covered Species. Research documents disease is having an adverse effect on Covered Species.

Response: If an unanticipated invasion by a new exotic species or impacts from wildlife disease occurs in the Plan Area and it has an adverse effect on Covered Species or habitats, the FCCD Plan Administrator will notify the USFWS of this Changed Circumstance. The Administrator will assess the damage caused or anticipated to be caused and coordinate with the Douglas County Weed Management Task Force on recommendations for control methods, or will coordinate with other entities such as WDFW to determine if measures can be implemented to lessen the impacts of disease.

Per the AMMP, FCCD will develop additional BMPs if needed to address invasive species. USFWS, FCCD, and/or Permittees will modify Farm Plans/GCP Site Plans to implement BMPs that facilitate invasive species control and will modify Farm Plans/GCP Site Plans to implement BMPs that facilitate native habitat recovery. USFWS, FCCD, and/or Permittees will cooperate with WDFW or other entities to support actions that lessen the impacts of disease.

If MSGCP expectations are not being met and cannot be mitigated through additional habitat quantity or quality protections, then the USFWS must revisit whether the MSGCP still meets issuance criteria, and if not, how and whether it can be revised, or whether Permits must be revoked.

Detailed Discussion: For the purpose of defining Changed Circumstances, invasion by exotic species or impacts from disease is defined as an unanticipated occurrence of a new exotic species

or disease within the Plan Area that has an adverse effect on Covered Species and/or their habitats.

Invasive and exotic species are currently present within the Plan Area. Monitoring and control of invasive and exotic (weed) species and research to determine their effects on Covered Species is described in Chapter 4, Adaptive Management and Monitoring Program. It is possible that an unanticipated introduction of additional new invasive species could occur in the Plan Area. Monitoring and research will be used to identify existing exotic species in the Plan Area so that new exotic species can be identified and possibly controlled if one occurs.

Chapter 4, Adaptive Management and Monitoring Program describes monitoring programs to evaluate habitat quality and shrub-steppe. This monitoring program increases the probability of early detection of a new exotic species. Early detection improves the chances of successfully addressing any threat posed by the new exotic species.

If an unanticipated invasion by a new exotic species occurs in the Plan Area, the FCCD Plan Administrator will notify the USFWS of this Changed Circumstance. The Administrator will assess the damage caused or anticipated to be caused by the exotic species invasion and coordinate with the Douglas County Weed Management Task on recommendations for control methods. Permittees will modify Farm Plans/GCP Site Plans to address the invasive species.

#7. Change to Habitat Conservation Area (HCA) Acres

Evidence: HCA acres decrease by 10 percent or more.

Response: If there is a decrease of 10 percent or more of total HCA acres (starting point 87,250 acres BLM, TNC, and WDFW lands), then additional measures should be implemented to make up for the habitat quality or quantity loss. If the lost acres cannot be mitigated through additional quantity or quality protections, then the USFWS must revisit whether the MSGCP still meets issuance criteria, and if not, how and whether it can be revised, or whether Permits must be revoked.

Detailed Discussion: As of September 2013, three entities own and/or manage over 87,000 acres of Habitat Conservation Areas: TNC-21,676 acres; BLM-53,965 acres; and WDFW 16,361 acres. It is likely that these acres will increase as all three entities are committed to land management for habitats and Covered Species in Douglas County and the Columbia Basin. These acres are very important for Covered Species persistence and survival in Douglas County, and therefore an annual tally of the protected acres should be conducted. If there is a decrease of 10 percent or more of total HCA acres, then additional measures should be implemented to make up for the habitat quality or quantity loss. If the lost acres cannot be mitigated through additional quantity or quality protections, then the USFWS must revisit whether the MSGCP still meets issuance criteria, and if not, how and whether it can be revised, or whether Permits must be revoked.

#8. New Listings of Species Not Covered by the MSGCP

Evidence: USFWS informs FCCD of proposed or new listing of a non-Covered Species.

Response: In the event of a new listing of one or more species not covered by the Douglas County MSGCP, the USFWS, FCCD, and the Permittee(s) will identify "no take/no jeopardy" measures and the Permittee(s) will include such measures in the implementation of their Covered Activities and will consider an amendment to the MSGCP to address the newly listed species. In addressing potential inclusion of new listed species in the MSGCP, the FCCD and USFWS will attempt to develop strategies that are least disruptive to the existing program.

Detailed Discussion: The new listing of a species not covered by this MSGCP may constitute a Changed Circumstance. The USFWS will notify the FCCD and Permittees in writing upon becoming aware that a species that is associated with habitat found in Douglas County and which is not a Covered Species may be or has been proposed for listing. Upon notice of the potential listing of a new species, FCCD may, but is not required to, enter into negotiation with the USFWS regarding necessary modifications to the MSGCP.

In the event that a non-Covered Species that may be affected by Covered Activities becomes listed under the ESA, the FCCD and Permittees will refrain from conducting Covered Activities which will result in take or jeopardy of the species or will implement the "no-take/no jeopardy" measures identified by the USFWS until permits are amended to include such species, or until the USFWS notifies the FCCD that such measures are no longer needed to avoid jeopardy to or take of the non-Covered Species.

The FCCD and/or Permittees may consider developing an amendment to the MSGCP to address the newly listed species in accordance with the modifications and amendment procedure described in this MSGCP. As budgets and priorities allow, the USFWS will provide technical assistance to identify any necessary modifications to the MSGCP should FCCD and/or Permittees elect to pursue amendment of the MSGCP. In developing such amendments, the USFWS will consider the mitigation and minimization already provided in this MSGCP and will attempt to address the newly listed species in a manner that results in the least amount of disruption to the Farm Plans/GCP Site Plans, while still meeting the conservation needs of the species.

#9. Designations of Critical Habitat for a Covered Species

Evidence: USFWS informs FCCD of proposed or new critical habitat designation for a Covered Species or a newly listed species.

Response: If the USFWS makes a determination that critical habitat may be adversely modified by the Covered Activities, it will reevaluate the incidental take permits and may revise the activities covered by them to avoid adverse modification. Permittees will implement such

necessary modifications until such time as they apply for and the USFWS approves an amendment, or until the USFWS notifies the Permittees that the modifications are no longer required.

Detailed Discussion: If the USFWS designates Critical Habitat for one of the Covered Species, or a newly listed species and such critical habitat may be adversely modified by the Covered Activities, the USFWS may consider this to be a Changed Circumstance. If the USFWS makes such a determination, it will reevaluate the incidental take permits issued under the MSGCP and may revise the activities covered to ensure that the activities allowed by the permits are not likely to result in adverse modification of any designated critical habitat. The Permittees will implement such necessary modifications until such time as they have applied for and the USFWS has approved an amendment of the incidental take permit in accordance with applicable statutory and regulatory requirements, or until the USFWS notifies Permittees that the modifications are no longer required. Designation of Critical Habitat does not constitute an Unforeseen Circumstance.

#10. A Covered Species is Delisted

Should any of the Covered Species in the MSGCP be delisted during the tenure of the permit, FCCD and Permittee may choose to consult with USFWS to determine whether mitigation measures for the delisted species can be discontinued. Because there are four covered species in the MSGCP, and the covered species rely on similar habitats, it is likely that many of the mitigation measures would likely continue.

#11. Funding is Not Acquired as Expected

Evidence: Funding is not adequate to ensure expected implementation and monitoring after initial five-year period.

Response: If there is not adequate funding to continue the MSGCP, then it will not proceed, permits may be revoked, and assurances will not continue to Permittees. Permittees may choose to voluntarily continue BMPs per their Farm Plans/GCP Site Plans.

Detailed Discussion: If funding is not acquired as expected, this may be a Changed Circumstance. At each year post permitting, by July 31, the FCCD will show that funding is adequate to ensure expected implementation and monitoring for, at minimum, the following year. If at any point the FCCD determines that funding is not adequate, they will notify the Service. If there is not adequate funding to continue the MSGCP, then it will not proceed, and assurances will not continue to Permittees. Permittees may still choose to voluntarily continue BMPs per their Farm Plans/GCP Site Plans but their incidental take permit may be revoked.

#12. FCCD Cannot Implement or Monitor as Expected

Evidence: FCCD does not contribute to implementation and monitoring as expected in the MOU and MSGCP

Response: If there is not adequate funding, interest, or contribution from FCCD to continue the MSGCP, then it will not proceed, permits may be revoked, and assurances will not continue to Permittees. Permittees may choose to voluntarily continue BMPs per their Farm Plans/GCP Site Plans.

Detailed Discussion: If FCCD cannot or does not contribute to implementation and monitoring as expected in the MOU (Appendix I) and the MSGCP, then this may constitute a Changed Circumstance. If there is not adequate funding, interest, or contribution from FCCD to continue the MSGCP, then it will not proceed, and assurances will not continue to Permittees. Permittees may still choose to voluntarily continue BMPs per their Farm Plans/GCP Site Plans but their incidental take permit may be revoked. Permittees may explore with the USFWS whether another entity could assume the FCCD implementation and monitoring responsibilities.

In the event of Changed Circumstances requiring additional analysis or additional information, the FCCD along with the appropriate State and Federal agencies will conduct an expedited analysis for the purpose of developing appropriate management responses to the Changed Circumstance. The Changed Circumstances analysis would commence as soon as the requisite personnel from the FCCD and the Federal and State agencies can be made available, but no later than 90 days following notification. In turn, management actions for these affected species, habitats, or key areas would be reviewed in light of the Changed Circumstances if a specific AMMP management analysis has been performed previously for such species, habitat, or key areas. The affected species, habitats, or key areas would be made a priority for analysis and development of appropriate management protocols if not previously developed as part of the AMMP established by this MSGCP.

FCCD will meet and confer with the applicable agencies in order to prioritize the analyses that need to be completed should multiple Changed Circumstances occur. This is of particular concern should events occur sufficiently close to each other in time so that a response would be delayed due to lack of available funds and personnel. Project prioritization would be first based on those species, habitats, or key areas that are most at risk of further adverse impacts. The outcome of the Changed Circumstance analysis would be the development of appropriate measures to minimize to the extent practicable the continued occurrence of adverse impacts on species, habitats, or key areas. Management mitigation measures developed would be implemented as soon as feasible. Ongoing management activities may continue until new measures resulting from the analyses are implemented. Minimization measures will be promptly implemented collaboratively by the agencies, Permittees, and FCCD to minimize adverse impacts prior to completion of the analysis to the extent feasible.

Responsibility for Addressing Changed Circumstances

Generally, Changed Circumstances responses will be initiated by either the FCCD or the USFWS. With FCCD- or Permittee-initiated response to Changed Circumstances, the FCCD or

Permittee will give notice to the USFWS within seven days after learning that any of the Changed Circumstances has occurred. Such notice will specify the remedial conservation measures the FCCD or Permittee proposes to implement to address the Changed Circumstance.

The USFWS will use their best efforts to respond to this notice within thirty (30) days. The response will take one of the following forms:

1. Concur with the FCCD or Permittee's proposed measures to address the Changed Circumstances.
2. Request changes in FCCD or Permittee's proposed measures consistent with Changed Circumstances expectations of the MSGCP.
3. Identify additional information necessary to enable the USFWS to evaluate FCCD or Permittee's proposed measures.
4. Disapprove measures, specifying the reasons for disapproval.

As soon as practicable after receiving concurrence from the USFWS, but no later than 90 calendar days after receiving such concurrence, the FCCD will modify its activities, or recommend Permittees modify their activities appropriately. Where emergency circumstances such as a natural disaster mandate the need to act in an expedited manner, FCCD or the Permittee will immediately contact the USFWS and request verbal concurrence with its plan to address the Changed Circumstances. In such cases, FCCD or Permittee will submit written documentation of its actions as soon as practicable, but no later than 90 calendar days after the emergency is under control. Such changes are provided for in the MSGCP and do not constitute Unforeseen Circumstances or require amendment of the Permits or MSGCP.

In the case of USFWS-initiated responses to Changed Circumstances, if the USFWS determines that Changed Circumstances have occurred and that the FCCD and/or Permittee(s) has not responded in accordance with Changed Circumstances discussion (above), the USFWS will notify the FCCD and/or Permittee and will direct the FCCD and/or Permittee to make the required changes. Within 90 calendar days after receiving such notice, the FCCD and/or Permittee will make the required changes and report to the USFWS on its actions. Such changes are provided for in the MSGCP, and hence do not constitute Unforeseen Circumstances or require amendment of the permit or MSGCP.

Provided that the Permittee has complied with its obligations under the MSGCP and the Permit, including any provisions for Changed Circumstances, adaptive management, and any other contingency measures provided for in the MSGCP, the USFWS can require Permittees to provide mitigation beyond that provided for in the MSGCP and Farm Plan/GCP Site Plan only in accordance with the ESA "No Surprises" regulations at 50 C.F.R. §§ 17.22(b)(5) and 17.32(b)(5). As recognized in the No Surprise Rule at 50 C.F.R. 17.22(b)(6) and 17.32(b)(6) the USFWS, any Federal, State, or local agency, or a private entity may take additional actions at

their own expense to protect or conserve a Covered Species within the Douglas County MSGCP area.

Unforeseen Circumstances

Unforeseen circumstances include circumstances that were not anticipated by the FCCD, the Permittee, or the USFWS during the preparation of the MSGCP that result in a substantial and adverse change in the status of the Covered Species. Unforeseen Circumstances are defined by federal regulation (50 CFR §17.3) as "changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that could not reasonably have been anticipated by plan or agreement developers and the USFWS at the time of the conservation plan's or agreement's negotiation and development, and that result in a substantial and adverse change in the status of the covered species."

The USFWS bears the burden of demonstrating that Unforeseen Circumstances exist, using the best scientific and commercial data available. If an Unforeseen Circumstance occurs during the term of the HCP, and if the USFWS determines that additional conservation and mitigation measures are necessary to respond to such Unforeseen Circumstances, then the USFWS may require more conservation measures of the permittee, but only if such measures are limited to modifications within conserved habitat areas, if any, or the HCP's operating conservation program for the affected species, and if such measures maintain the original terms of the HCP to the maximum extent possible (50 CFR 17.22).

Notwithstanding the foregoing paragraph:

1. The USFWS will clearly document any findings of Unforeseen Circumstances. In determining whether any event constitutes an unforeseen circumstance, the USFWS will consider, but not be limited to, the following factors: 1) the extent of the current range of affected species, 2) percentage of range adversely affected by the MSGCP, 3) the percentage of range of the affected species conserved by the MSGCP, 4) the ecological significance of that portion of the range affected by the MSGCP, 5) the level of knowledge about the affected species and habitat and the degree of specificity of the species' conservation program under the MSGCP, and 6) whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.
2. The USFWS will not require the commitment of additional land, water, or financial compensation by the Permittees without the consent of Permittees or FCCD or impose additional restrictions on the use of land, water, or natural resources otherwise available for use by the Permittees under the original terms of the MSGCP, including additional restrictions on covered actions that are permitted under the MSGCP.

3. Nothing in this policy will be construed to limit or constrain the USFWS or any other governmental agency or individual from taking additional actions at its own expense to protect or conserve a species included in an MSGCP.

In the event of Unforeseen Circumstances the USFWS will provide written notice (except where there is substantial threat of imminent, significant adverse impacts to a Covered Species) to the FCCD and Permittees with a detailed statement of the facts regarding the unforeseen circumstance involved, the anticipated impact(s) thereof on the Covered Species and its habitat, and all information and data that supports the assertion. In addition, the notice will include any proposed conservation measure(s) that is believed would address the Unforeseen Circumstance, an estimate of the cost of implementing such conservation measure, and the likely effects upon the:

1. Existing plans and policies of any Federal or State land managers, and
2. Multiple users of habitats which might be involved in the imposition or implementation of the conservation measure(s).

If the USFWS makes a finding of Unforeseen Circumstances, the Permittees will avoid contributing to appreciably reducing the likelihood of the survival and recovery of the affected species, during the period necessary to determine the nature and location of additional or modified mitigation.

Evaluation of Unforeseen Circumstances

During the period necessary to determine the nature and location of additional or modified mitigation, the USFWS may request that the Permittees and/or the FCCD perform an expedited AMMP and HSI analysis of the Covered Species or its habitat. The FCCD and Permittees may submit information to the USFWS and may request in writing additional time for submission of said information. The USFWS may agree to this additional time if valid reasons are presented and the Covered Species are not further harmed. The USFWS may use requested or provided information to modify or redirect existing conservation measures within the limits previously described.

Federal No Surprises Regulation

The No Surprises Regulation states that if a Permittee is properly implementing an HCP that has been approved by USFWS, no additional commitment of resources beyond that already specified in the plan will be required. "Properly implemented conservation plan" means any HCP and permit whose commitments and provisions have been and are being fully implemented by the permittee and in which the permittee is in full compliance with the terms and conditions of the permit, so the HCP is consistent with the agreed-upon operating conservation program for the project. A properly-implemented conservation plan for the MSGCP includes implementation of the Adaptive Management and Monitoring Program and resultant revision of conservation plan

components through that program. It also includes the responses to Changed Circumstances provided for in the MSGCP.

The Permittees request regulatory assurances (No Surprises) for all Covered Species in the Plan. In accordance with No Surprises, the FCCD and Permittees will be responsible for implementing and funding adaptive management and remedial measures in response to any Changed Circumstances as described in this chapter. Permittees are also responsible for compliance with their individual permits. The Permittees would only be obligated to address Unforeseen Circumstances within the specified limits described above under Unforeseen Circumstances. The Permittees understand that No Surprises assurances are contingent on the proper implementation of the permits and the MSGCP. The Permittees also understand that USFWS may suspend or revoke the Federal permit, in whole or in part, in accordance with Federal regulations (50 CFR Section 13.27 and 13.28 and other applicable laws and regulations) in force at the time of such suspension.

Application of ESA Requirements

Federal Budgets

Implementation of the MSGCP by the USFWS and other Federal agencies is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this MSGCP will be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The USFWS will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures in writing.

Section 7 Consultation and Conferences

No action(s) presented in this MSGCP is/are intended to apply to any activity on Federal lands or federally funded projects that are governed by Section 7 of the ESA. Nothing in this MSGCP is intended to alter the obligation of a Federal agency to consult with the USFWS pursuant to Section 7 of the ESA (16 U.S.C. 1536{a}). Nothing contained in this MSGCP is intended to prohibit or proscribe the USFWS from requiring minimization in excess of that provided for in the MSGCP, should the circumstances so warrant.

Consideration of the MSGCP in Section 4 Listing or Critical Habitat Findings

The USFWS will specifically inform FCCD of any listing or designation proposal under ESA Section 4 of the ESA for species and critical habitats in Douglas County in writing. The USFWS will consider actions undertaken by FCCD and Permittees under the MSGCP in making their determination to the extent permitted by law.

The USFWS has not designated critical habitat for any Covered Species within the Douglas County MSGCP area. Critical habitat for the pygmy rabbit has not been designated to date. Effects to critical habitat must be evaluated for projects that are governed by Section 7 of the ESA.

The USFWS agrees to assess future designations of critical habitat with the recognition that the MSGCP is in place and is contributing to habitats for the Covered Species. The USFWS and FCCD recognize that they have a strong conservation partnership and that due to the voluntary and programmatic nature of this MSGCP the enrolled lands may vary over time. They also recognize that ESA policies are constantly evolving. However, nothing in this document is intended as a commitment by USFWS to exclude the MSGCP area from any critical habitat designation.

Future Recovery Plans

Recovery Plans under ESA delineate actions necessary to recover and protect Federally-listed species. These plans frequently include information, or may lead to the development of information, that can contribute to the development of an Adaptive Management and Monitoring Program. However, Recovery Plans are not regulatory documents and would not obligate any MSGCP Permittee, individual, or entity, including Federal agencies, to undertake specific tasks.

Procedures for Modifications of and Amendments to the MSGCP

Modifications and amendments to the Douglas County MSGCP are not anticipated on a regular basis. Certain events, however, may trigger modifications or amendments to the MSGCP. The FCCD or USFWS may seek a modification or amendment to the MSGCP**.**

Clerical Changes

Clerical changes to the Douglas County MSGCP shall be made by the FCCD on its own initiative or in response to a written request submitted by any Permittee or the USFWS, which includes documentation supporting the proposed clerical change. Clerical changes shall not require any amendment to the MSGCP or Permits. Clerical changes include corrections of typographical, grammatical, and similar editing errors that do not change the intended meaning and corrections of any maps or exhibits to correct insignificant errors in mapping. The FCCD and USFWS anticipate that most clerical changes to the MSGCP would occur during the first ten (10) years of the Permits. Annual reports shall include a summary of clerical changes made to the MSGCP in the preceding calendar year.

Clarifications and Administrative Modifications

It may be necessary from time to time for the USFWS and the FCCD Plan Administrator to resolve issues that arise with respect to the administration of the process or possibly the precise meaning and intent of the language contained within the MSGCP documents. Clarifications as a

result of these collaborative efforts do not change the provisions of any of the MSGCP documents in any way, but merely clarify and make more precise the provisions as they exist.

Future minor administrative modifications to the MSGCP that do not make substantive changes to any of the provisions are expected. These changes may be necessary or convenient to represent more fully the overall intent of the FCCD, the Permittees, and the USFWS.

Clarifications and administrative modifications to the MSGCP must be mutually agreed to by USFWS and FCCD and may be approved by the Manager, Washington Fish and Wildlife Office, U.S. Fish and Wildlife Service, Lacey, Washington, and by the FCCD's Board of Supervisors. Clarifications and minor administrative modifications to the Permit may be approved by the Fish and Wildlife Service Regional Office. These actions may follow review and approval by the IM Committee. This action will also be memorialized by letter agreement or by substituted MSGCP Documents that have been modified to contain only the clarification or minor administrative modification. It is suggested that any request for clarification or any proposed minor administrative modification be processed and a response provided within 30 days after receipt by the USFWS or the IM Committee.

The MSGCP may, under certain circumstances, receive modifications of a minor or technical nature and these are described below under "Minor Modifications".

Land Use Changes

The FCCD and USFWS agree that planning, zoning, and land-use decisions by Douglas County and its cities are matters within the sole discretion of the County and Cities and will not require amendments to the MSGCP. No such action by Douglas County or its cities will in any way alter or diminish the FCCD's or Permittees' obligations under the MSGCP. Actions outside of the Covered Activities cannot be covered by inclusion under the ESA Section 10 permit including, but not limited to, non-agricultural development of land within the Plan Area. Agricultural land use changes by Permittees consistent with the MSGCP may be addressed through an amended Farm Plan/GCP Site Plan and possible permit amendments.

Adaptive Management Changes

It is expected that over time, the AMMP will result in recommended modifications and changes to BMPs undertaken and/or financed by the FCCD and/or Permittees. Such future conservation measures may or may not be proposed in the original MSGCP, but may be developed by FCCD, the Federal and State land managers, and the USFWS. BMPs or MSGCP changes undertaken pursuant to the AMMP, will require prior approval by the Service, but as long as they do not materially modify the scope or nature of activities or actions covered by the MSGCP, or result in more take of Covered Species or less mitigation or conservation of Covered Species, will not require a major amendment.

Subsequent Listing of Covered Species

In the event Covered Species that are currently not listed as threatened or endangered become listed, the measures set forth in the MSGCP are designed to provide adequate protection for all such Covered Species. Upon the listing of any Covered Species, the USFWS will notify the FCCD and Permittees of coverage of such Covered Species under the provisions of Section 10 of the ESA. The Covered Species will be named on the permits at the time of issuance, with an effective date that reads "upon listing."

Minor Modifications

Minor modifications are changes to the MSGCP of a minor or technical nature where the effect on covered species, level of take, and Permittees' ability to implement the MSGCP are not materially different from those described in the MSGCP as originally adopted. Minor modifications to the Douglas County MSGCP that shall not require amendments are listed below. Minor modifications include, but are not limited to, the following:

1. Minor corrections or changes to land ownership or land leases.
2. Minor revisions to survey, monitoring, and/or reporting protocols that clearly do not change effects to Covered Species or MSGCP functions.
3. Updates and/or corrections to maps or species occurrence data to correct errors in mapping or to reflect previously approved changes in the MSGCP and/or incidental take permits.
4. Minor modifications to best management practices and other measures that provide proportional protection and do not increase the level of take.
5. Minor revisions in financial accounting or analysis (such as HSI analysis process).
6. Modifying existing or establishing new measures to further minimize or avoid take of the Covered Species.

Minor modifications will not include proposals that the USFWS determines would result in in operations under the MSGCP that are materially different in their effects on listed species from those analyzed in connection with the original MSGCP, that cause adverse effects on the environment, or that result in additional take not analyzed in connection with the original MSGCP.

Procedure for Minor Modifications

The FCCD or the USFWS may propose minor modifications to the Douglas County MSGCP by providing written notice to the other party. Such notice shall include 1) a description of the proposed minor modification, 2) an explanation of the reason for the proposed minor modification, and 3) a description of why the effects of the proposed minor modification on Covered Species are not materially different from, and are biologically equivalent to the terms of the MSGCP as originally adopted.

The FCCD and USFWS will use their best efforts to respond in writing to the proposal within 60 calendar days of receipt of the request. The response will either 1) concur with the proposed modification, 2) concur with the proposed modification with requested changes, 3) identify additional information necessary to enable evaluation of the proposed modification, or 4) disapprove the proposed modification, stating reasons for the disapproval. The FCCD and the USFWS must agree in writing to any minor modification, including the schedule for implementation, before implementation of such modification. Any minor modification that is disapproved may be submitted as a major amendment.

Conservation measures undertaken pursuant to the AMMP will not require formal amendment of any of the MSGCP Documents, but will be processed and receive prior approval by the USFWS and the Districts' Board of Supervisors. This may be done at any time or in connection with the review and approval of the biennial implementation plan and budget. Except for minor amendments and clarifications, amendments or modification to the MSGCP will require the written approval of the Districts' Board of Supervisors and the USFWS in accordance with the provisions described below. The IM Committee will review the proposed changes or amendments and make recommendations to the Districts' Board of Supervisors prior to submission for signatory approval.

Major Amendments

Adaptive management changes that may result in less mitigation or conservation than provided for Covered Species under the original terms of the MSGCP require a major amendment. Adaptive management under the MSGCP does not authorize any modifications that would result in an increase in the amount and nature of take or increase the impacts of take of Covered Species beyond that analyzed under the original MSGCP and any amendments thereto. Any such modification must be reviewed as a Major Amendment.

The MSGCP may not be amended or modified in any way without the written approval of the FCCD Board of Supervisors and the USFWS. All proposed changes or amendments (other than minor modifications) will be reviewed by the FCCD Plan Administrator, who will make a recommendation to the Board of Supervisors. Material changes shall be processed as an amendment to the permit in accordance with the provisions of the ESA and regulations at 50 CFR Parts 13 and 17 and shall be subject to appropriate environmental review under the provisions of NEPA. Major Amendments are those proposed changes to the MSGCP and the Permits that are not Modifications or Minor Modifications. Major Amendments to the MSGCP shall require a public notice as required by applicable laws and regulations. The FCCD will submit any proposed Major Amendment to the USFWS.

Major amendments may include, but are not limited to, the following:

1. Adding a new species to the list of Covered Species contained in the MSGCP and/or the incidental take permits.

2. The modification of any project action or mitigation component under the MSGCP, including funding, that exceeds authorized take levels, effects of the project, or the nature or scope of the mitigation program.
3. Any other modification of the project likely to result in adverse effects to the Covered Species not addressed in the original MSGCP and Permit application.
4. Changes to the boundary of the MSGCP area.
5. Changes in the MSGCP funding strategies and schedule that would have adverse effects on Covered Species.
6. Changes to the Covered Activities that were not addressed in the MSGCP as originally adopted, and that otherwise do not meet the criteria for a minor modification as discussed above.
7. Extending the term of the MSGCP or the incidental take permits.

Procedure for Major Amendments

A major amendment of the MSGCP or incidental take permits would be treated in a similar process as a new permit application. A major amendment requires that a written application be submitted to the USFWS and that implementation of all permit processing procedures applicable to an original incidental take permit occurs. The specific documentation required to comply with the ESA and the National Environmental Policy Act may vary based on the nature of the amendment. The FCCD will ensure that major amendments are subject to review and approval by the FCCD and other Permittees as appropriate, potentially at a public meeting.

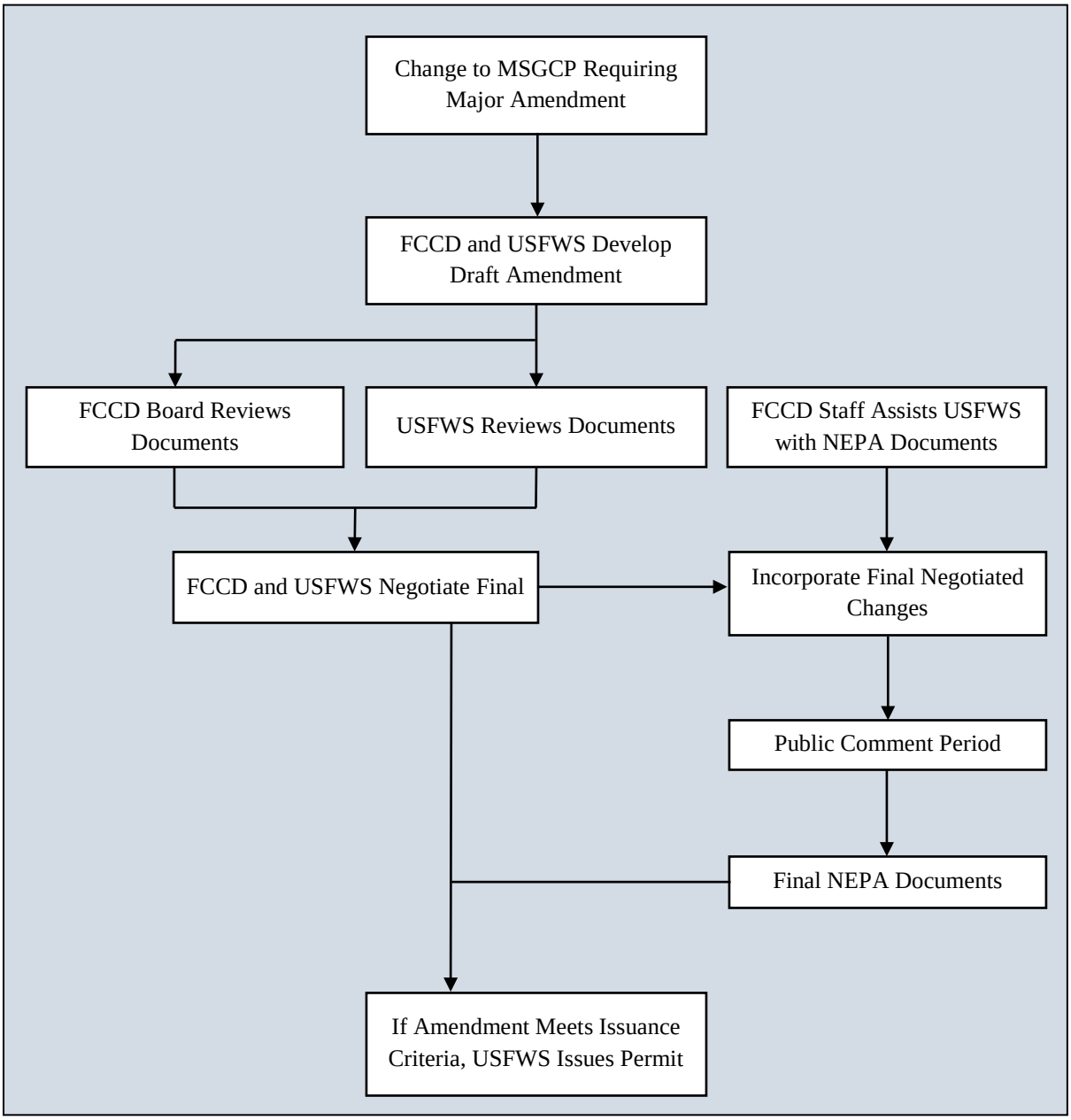

Figure 4-1: Major (Formal) Amendment Flow Chart

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Douglas County Multiple Species General Conservation Plan

Glossary

Adaptive management - A type of natural resource management in which decisions are made as part of an on-going process. Formal adaptive management often involves testing, monitoring, evaluation, and incorporating new knowledge into management approaches based on scientific findings and the needs of society. Results are used to modify management policy.

Anadromous fish - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon and steelhead are examples.

Anthropogenic - Action created by man.

Applicants - Private agriculture landowners or lessees who join the MSGCP through development of a Farm Plan and other processes described in the GCP and apply for an Incidental Take Permit.

Best Management Practice (BMP) - A general term for many kinds of conservation measures, including Conservation Practices, land-use measures, and species-specific measures.

Biological Diversity or Biodiversity - The relative distribution and abundance of different plant and animal communities and species within an area.

Biological Corridor - A habitat band linking habitat areas or reserved areas.

Biological Opinion - A document which includes: 1) the opinion of the Fish and Wildlife Service or the National Marine Fisheries Service as to whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat; 2) a summary of the information on which the opinion is based; and 3) a detailed discussion of the effects of the action on listed species or designated critical habitat.

Candidate species - Under USFWS's ESA regulations, "...those species for which the USFWS has on file sufficient information on biological vulnerability and threat(s) to support proposals to the list them as endangered or threatened species, but for which no listing action has been proposed."

Changed Circumstances - Means changes in circumstances affecting a covered species or the geographic area covered by the MSGCP that can reasonably be anticipated by the parties to the MSGCP and that can reasonably be planned for in the MSGCP (e.g., the listing of a new species, or a fire or other natural catastrophic event in areas prone to such event. Changed Circumstances are not Unforeseen Circumstances.

Connectivity - A measure of the extent to which conditions between essential or key habitat areas provide habitat dispersal and movement of covered species.

Conservation Plan - Under Section 10(a)(2)(A) of the ESA, a planning document that is a mandatory component of an "incidental take permit application, also known as a Habitat Conservation Plan or HCP.

Conservation Practice - Specific guidelines of the NRCS, such as Contour Buffer Strips, that will be utilized for mitigation and minimization for covered activities under the MSGCP.

Conservation Plan Area - Lands and other areas encompassed by specific boundaries that are affected by the conservation plan and incidental take permit, also known as the "Plan Area."

Cover - Vegetation used by wildlife for protection from predators, to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Covered Activities - Certain activities carried out by Permittee on covered lands that may result in incidental take of covered species.

Covered lands - The lands upon which the permit authorizes incidental take of covered species and the lands to which the MSGCP's conservation and mitigation measures apply. For the MSGCP, these lands include agricultural lands in Douglas County where Permittees have received a certificate of inclusion.

Covered Species – The species that have been adequately addressed in an HCP (or the MSGCP) and are included on an ITP. Covered species are also subject to the assurances of the "No Surprises" policy.

Critical Habitat - Specific geographic areas designated by the National Marine Fisheries Service or the Fish and Wildlife Service that are essential for the conservation of a threatened or endangered species and which may require special management considerations. These areas do not necessarily have to be occupied by the species at the time of designation.

Cumulative Impact or Effect - Under NEPA regulations, the incremental environmental impact or effect of the action together with impacts of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Under ESA Section 7 regulations, the effects of future State or private activities not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation.

CP (Conservation Practice Standard) - NRCS conservation practice standards provide guidance for applying conservation technology on the land and set the minimum acceptable level for application of the technology.

De-list - To remove from the Federal list of endangered and threatened species because such species no longer meets any of the five listing factors provided under section 4(a)(1) of the ESA and under which the species was originally listed (i.e., because the species has become extinct or is recovered).

Land use area - Those portions of the conservation plan area that are proposed for development or land use or are anticipated to be developed or utilized.

Down-list - To reclassify an endangered species to a threatened species based on alleviation of any of the five listing factors provided under section 4(a)(1) of the ESA.

Ecosystem - The complete biological and biotic system formed by the interaction of a group of organisms and the environment.

Ecosystem-based management - Scientifically based land and resource management that integrates ecological capabilities with social values and economic relationships to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, values and services over the long term.

Ecosystem health (rangeland health) - A condition where the parts and functions of an ecosystem are sustained over time and where the system capacity for self-repair is maintained, such that goals for use, values, and services of the ecosystem are met.

Effect or impact - Under NEPA regulations, a direct result of an action that occurs at the same time and place; or an indirect result of an action which occurs later in time or in a different place and is reasonably foreseeable; or the cumulative results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Under ESA Section 7 regulations, "effects of the action" means "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action that will be added to the environmental baseline."

Edge - Where different plant communities meet or where variations in successional stage or vegetation conditions within the plant community come together.

Endangered species - "...any species [including subspecies or qualifying distinct population segment] which is in danger of extinction throughout all or a significant portion of its range (ESA)."

Endangered Species Act of 1973, as amended - 16 U.S.C. 1513-1543; Federal legislation that provides a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved and that provides a program for the conservation of such endangered and threatened species.

Environmental Assessment (EA) - A concise public document prepared in compliance with NEPA that briefly discusses the purpose and need for an action and alternatives to such action, and that provides sufficient evidence and analysis of impacts to determine whether to prepare an Environmental Impact Statement or Finding of No Significant Impact.

Environmental Impact Statement (EIS) - A detailed written statement required by Section 102(2)(C) of NEPA containing, among other things, an analyses of environmental impacts of a proposed action and alternatives considered, a description of adverse effects of the project that cannot be avoided, and a discussion of alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources.

Farm Plan - A generic term that typically refers to aNatural Resource Conservation Service "Conservation Plan" and can be based on the NRCS Resource Management System (RMS) planning process. The Farm Plan will include CPs for a site specific area. A GCP Site Plan includes additional BMPs (land-use measures, and species-specific measures described in Appendix E of MSGCP). The Farm Plan and GCP Site Plan together result in a site-specific plan for land leased or owned by an Applicant/Permittee that is developed consistent with expectations of the MSGCP. **Forage** - All browse and non-woody plants available to livestock or game animals and used for grazing or harvested for feeding.

Fragmentation - Breaking up of contiguous areas into progressively smaller patches of increasing degree of isolation. The opposite of connectivity defined above.

General Conservation Plan - A General Conservation Plan (GCP) is a type of programmatic HCP under which multiple Section 10 permits can be issued (USFWS 2007).

GCP Site Plan –A GCP Site Plan includes additional BMPs (land-use measures, and species-specific measures described in Appendix E of MSGCP). The Farm Plan and GCP Site Plan together result in a site-specific plan for land leased or owned by an Applicant/Permittee that is developed consistent with expectations of the MSGCP.

Guidelines - Actions, priorities, processes, or prescriptions that are expected to assist in meeting plan or project objectives. Guidelines are not required, but would be considered in the planning and analysis of resource management projects.

Habitat - The location where a particular taxon of plant or animal lives and its surroundings, both living and non-living. The term includes the presence of a group of particular

environmental conditions surrounding an organism including air, water, soil, mineral elements, moisture, temperature, and topography.

Habitat Conservation Area (HCAs) - Multiple-use areas or wildlife-emphasis areas owned and/or managed by mostly BLM, WDFW, and TNC in Douglas County.

Habitat Conservation Plan (HCP) – See Conservation Plan.

Habitat diversity - The distribution and abundance of different plant and animal communities and species within a specific area.

Habitat fragmentation - The breaking up of habitat into discrete islands through modification or conversion of habitat by management activities.

Habitat Suitability Index - A model used to analyze the effects of an action, including estimates of changes to a species' habitat quality and quantity based on hypotheses of species-habitat relationships**.** The models for the covered species were developed based on Fish and Wildlife Service HSI models that are typically used for evaluating impacts on fish and wildlife habitat resulting from water or land use changes. The models and resultant maps for the MSGCP provide a broad view of habitat throughout the county. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

Habitat type (vegetative) - An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Harm - Defined in regulations implementing the ESA promulgated by the Department of the Interior as an act "which actually kills or injures" listed wildlife. Harm may include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." NMFS has not defined "harm" by regulation.

Harass - Defined in regulations implementing the ESA promulgated by the Department of the Interior as "an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns that include, but are not limited to, breeding, feeding, and sheltering. NMFS has not defined "harass" by regulation.

Historical range of variability - The range of vegetation condition levels present during the past historical period.

Historical - Refers to the period of time for which there is written records.

Incidental take - Take of any Federally-listed wildlife species that is incidental to, but not the purpose of, otherwise lawful activities (see definition for "take") [ESA Section 10(a)(1)(B)].

Incidental Take Permit (ITP) - A permit that exempts a Permittee from the take prohibition of Section 9 of the ESA issued by the USFWS or NMFS pursuant to Section 10(a)(l)(B) of the ESA.

Lek - A gathering area for displaying and mating used in the spring by Columbian sharp-tailed grouse or greater sage-grouse and often referred to as a dancing ground.

Listed species - A species (including a subspecies or a distinct population segment of a vertebrate species) that is listed as endangered or threatened under the ESA.

Mitigation - Under NEPA regulations, to moderate, reduce or alleviate the impacts of a proposed activity, including a) avoiding the impact by not taking a certain action or parts of an action, b) minimizing impacts by limiting the degree or magnitude of the action, c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment, d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, e) compensating for the impact by replacing or providing substitute resources or environments.

Monitoring - The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

Multi-Species General Conservation Plan (MSGCP) - A programmatic habitat conservation plan prepared by Foster Creek Conservation District and the U.S. Fish and Wildlife Service for certain agriculture activities in Douglas County, Washington.

National Environmental Policy Act (NEPA) - Federal legislation establishing national policy that environmental impacts will be evaluated as an integral part of any major Federal action.

No Surprises - Assurances provided by the government through the Section 10(a)(1)(B) process to non-Federal landowners. Essentially, private landowners are assured that if "unforeseen circumstances" arise, the Services will not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed to in the HCP without the consent of the Permittee.

Noxious weeds (undesired vegetation) - Rapidly spreading plants that can cause a variety of major ecological or economic impacts to both agriculture and wildlands.

Permit - The incidental take permit issued by the Services to Permittees pursuant to Section 10(a)(1)(B) of the ESA.

Permittee – Private agriculture landowner or lessee who has received an incidental take permit pursuant to the MSGCP.

Person - "...an individual, corporation, partnership, trust association, or any other private entity; or any officer, employee, agent, department or instrumentality of the Federal government, of any State, municipality, or political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States" [Section 3(12) of the ESA].

Proposed action - Under NEPA regulations, a plan that has a goal which contains sufficient details about the intended actions to be taken or that will result, which allow alternatives to be developed and environmental impacts to be analyzed (40 CFR 1508.23).

Proposed species - A species for which a proposed rule to add the species to the Federal list of threatened and endangered species has been published in the Federal Register.

Riparian areas/habitats - Areas of land that are directly affected by water, usually having visible vegetation or physical characteristics reflecting the influence of water. Areas adjacent to stream, lake edges, or marshes are typical riparian areas.

Section 7 - The section of the ESA that describes the responsibilities of Federal agencies in conserving threatened and endangered species. Section 7(a)(1) requires all Federal agencies "in consultation with and with the assistance of the Secretary [to] utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species." Section 7(a)(2) requires Federal agencies to "ensure that any action authorized, funded, or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of..." designated critical habitat.

Section 9 - The section of the ESA dealing with prohibited acts, including the "take" of any listed species without specific authorization of the Fish and Wildlife Service or the National Marine Fisheries Service for species under the jurisdiction of each agency.

Section 10 - The section of the ESA dealing with exceptions to the prohibitions of section 9 of the ESA.

Section 10(a)(1)(a) - That portion of Section 10 of the ESA that allows for permits for the taking of threatened or endangered species for scientific purposes or for purposes of enhancement of propagation or survival. It also applies to Safe Harbor Agreement permits.

Section 10(a)(1)(b) - That portion of Section 10 of the ESA that allows for permits for incidental taking of threatened or endangered species.

Set of Findings - USFWS document (also used by NMFS) that evaluates, for the administrative record, a Section 10(a)(1)(B) permit application in the context of permit issuance criteria found at Section 10(a)(2)(B) of the ESA and 50 CFR Part 17.

Soil productivity - Capacity or suitability of a soil for establishment and growth of a specific crop or plant species primarily through nutrient availability.

Species - "...any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature" (Section 3(15) of the ESA).

"T" - For a specific soil, the maximum average annual soil loss tolerance is expressed as tons per acre per year that will permit current production levels to be maintained economically and indefinitely; the soil loss tolerance levels typically range in value from 2 to 5 tons per acre per year.

Take - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any listed or unlisted covered species. See Harm and Harass.

Threatened species - A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Unlisted species - A species (including a subspecies or a distinct population segment of a vertebrate species) that is not listed as endangered or threatened under the ESA. Sometimes certain unlisted species are called "species of concern."

Unforeseen circumstances - Changes in circumstances affecting a species or geographic area covered by a conservation plan that could not reasonably have been anticipated by plan developers and the Services at the time of the conservation plans negotiation and development, and that result in a substantial and adverse change in the status of the covered species.

Viable Population - Wildlife or plant population that contains an adequate number of reproductive individuals to ensure the long-term existence of the species.

Watershed - An entire area that contributes water to a drainage system or stream.

Douglas County Multiple Species General Conservation Plan

Appendix A: Douglas County MSGCP Coordination Memorandum Of Understanding

MEMORANDUM OF UNDERSTANDING

by and between

UNITED STATES FISH AND WILDLIFE SERVICE

and the

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

and the

NATURE CONSERVANCY

and the

BUREAU OF LAND MANAGEMENT

and the

FOSTER CREEK CONSERVATION DISTRICT

This Memorandum of Understanding (Memorandum) is made and entered into this [*X day of Month, 2015*], by and between the Fish and Wildlife Service (USFWS), the Washington Department of Fish and Wildlife (WDFW), The Nature Conservancy (TNC), the Bureau of Land Management (BLM) and the Foster Creek Conservation District (FCCD). Collectively the USFWS, WDFW, TNC, BLM, and FCCD are referred to as the "signees."

The signees have regulatory authority, responsibility, or interest in conserving Federal and State listed species and other species of concern (Covered Species) in Douglas County, Washington. The multiple sources of authority under which the signees operate do not provide any individual agency with the authority to implement a comprehensive program, enlisting the efforts of all levels of government to provide for the long-term survival of the Covered Species in Douglas County. The signees desire that their respective concerns and responsibilities with regard to the conservation of the Covered Species be integrated and coordinated in such a manner as to ensure effective, timely, and mutually beneficial resolution of such issues with FCCD. The signees, along with representatives from the agricultural community and others, have developed a program to conserve Covered Species in Douglas County with an emphasis on the private agricultural lands of the County.

The FCCD desires that agricultural operators (Permittees) comply with State or Federal environmental and endangered species statutes and regulations, and along with the local agriculture industry, that planning within the County provides for continued economic growth and development and ensures a healthy economy and environment for its citizens and agricultural operators.

1.0—Purpose of Memorandum

The signees have entered into this Memorandum to define relationships with one another to implement a cooperative program called the Douglas County Multiple Species General Conservation Plan (MSGCP), which will ensure that the Covered Activities of Permittees will comply with applicable laws and regulations concerning the Covered Species in Douglas County, and which will provide long-term protection of such species.

2.0—Purpose of the Program

The purposes of the MSGCP are as follows:

2.1—*Protection of Covered Species*. To conserve and promote the Covered Species and their habitats within Douglas County.

2.2—*Assurances to Private Sector*. To provide a means to standardize and integrate mitigation/minimization measures within the MSGCP in order to meet the issuance criteria for a General Conservation Plan in order for covered non-Federal agricultural operators to receive assurances under Section 10 of the Endangered Species Act of 1973, as amended, consistent with the USFWS' "no-surprises" regulation.

2.3. *Ensure Support of the MSGCP*. To ensure the signees are supportive of the MSGCP, and will use their resources to coordinate on MSGCP implementation.

3.0—Authorities

This MOU is made and entered into pursuant to the provisions of the following statutes:

- *Bureau of Land Management*—The Federal Land Policy and Management Act (P.L. 94–579) (FLPMA).
- *Foster Creek Conservation District*—Corporate status and powers of district (RCW 89.08.220 [4][5][8]) and intergovernmental cooperation authority (RCW 89.08.341).
- *The Nature Conservancy*—The Nature Conservancy is a private, non-profit organization incorporated in the District of Columbia whose mission is to preserve plants, animals, and natural communities that represent the diversity of life on earth by protecting the lands and water they need to survive.
- *USDA Natural Resource Conservation Service*—Soil and Water Conservation Soil Conservation and Domestic Allotment Act of 1936, as amended (P.L, 74-46, 16 U.S.C. 590 a-f.) (CFDA 10.902)

- *US Fish and Wildlife Service*—Fish and Wildlife Coordination Act, as amended (16 USC § 661[1]), ". . . to provide assistance to, and cooperate with, Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife, resources thereof, and their habitat . . ." and the Endangered Species Act as amended (16 USC § 1531 2[b]) which provides a "means whereby the ecosystems upon which endangered species and threatened species depend may be conserved…".
- *Washington Department of Fish and Wildlife*—under the authority of RCW 39.34, the Interlocal Cooperation Act, and under the authority of RCW 77.12.230

The foregoing shall be accomplished both through a commitment to maintain and manage TNC lands, BLM lands, and WDFW lands in Douglas County for the benefit of Covered Species and shrub-steppe habitats in the future, and through certain procedural components of the MSGCP, including involvement in coordination, education, technical assistance, species inventory, and monitoring and adaptive management, as described in the MSGCP.

4.0—Responsibilities of Each Signee

4.1—Washington State Department of Fish and Wildlife

- Coordinate with USFWS and the appropriate stakeholders and land managers to develop species recovery plans as needed.
- Include information about the MSGCP or Covered Species in agency hunting and fishing publications as relevant, especially regarding greater sage-grouse, Columbian sharp-tailed grouse, Washington ground squirrel, or Columbia Basin pygmy rabbit identification.
- Facilitate awareness of the MSGCP in ongoing projects in north-central Washington.
- Conduct and/or support life history assessments and population surveys for native wildlife species in Douglas County. Species covered in the MSGCP will be considered when developing monitoring priorities.
- Continue to survey and document ranges, populations, and habitats for Covered Species in Douglas County, as expected in the MSGCP Table 4-5: Monitoring and Evaluation Measures.
- Coordinate with the Adaptive Management/Monitoring Programs in setting species priorities, selecting survey methods, and evaluating data collected.
- Prohibit unauthorized off-road driving on agency lands in Douglas County.
- Support efforts to apply integrated pest practices in the management of unwanted vegetation on public and private lands.
- Provide technical assistance (i.e. information on site preparation, plant materials, and planting techniques) to the IM Committee for habitat enhancement or restoration practices.
- Provide consideration to MSGCP Applicants/Permittees as WDFW private lands biologists plan and implement habitat restoration and enhancement projects.

- Manage agency-owned or controlled lands in accordance with goals set by HB1309 Ecosystem Standards and adhere to Wildlife Area management plans.
- Coordinate with and provide technical assistance to the IM Committee, including, but not limited to, the development and implementation of the Adaptive Management/Monitoring Program, review, evaluation and collection of data for Covered Species, and assistance in related Applicant/Permittee or public workshops.
- Coordinate with BLM and USFWS on MSGCP species issues in Douglas County.
- Regulate hunting, fishing, and trapping in Douglas County.
- Review any potential sales or trades of WDFW-owned land within Douglas County as to their impact on HCA habitat for the MSGCP.
- Commit to seek funding to allow WDFW to fully perform the obligations and tasks pursuant to the MSGCP, including, but not limited to, coordinating with and providing technical assistance to the IM Committee.
- Assist Applicants/Permittees and other County landowners with management of wildlife-related recreation through various regulated-access programs offered by WDFW.
- Share appropriate data regarding the MSGCP and Covered Species with FCCD.
- Consider the MSGCP when making agency decisions regarding harvest, predator control, enforcement emphasis, education, and outreach.
- Consider additional property acquisition and/or conservation easements as appropriate to ensure protection and enhancement of the HCA lands.

4.2—U.S. Fish and Wildlife Service

- Continue to provide technical assistance during implementation of the MSGCP, including assistance with educational opportunities for Applicants/Permittees and other interested publics and assistance with cultural resources and NHPA as appropriate.
- As feasible, assist with relevant ESA review of Federal actions in Douglas County to complement the MSGCP.
- Advise FCCD on available grant opportunities.
- Subject to the availability of federal appropriations, develop and encourage implementation of recovery plans for Federally-listed species.
- Inform the FCCD about any Federal species status reviews or listing proposals relevant to Douglas County.
- Inform the FCCD about any critical habitat designations for Federally-listed species relevant to Douglas County.
- Support consolidation of public ownership into the Moses Coulee Management area or other key areas in Douglas County to provide HCA lands.
- Conduct and/or review compliance monitoring to verify that actions are being accomplished on the ground as outlined in the MSGCP and reports. Monitoring on private land will be done with notice and permission, except that the USFWS may

conduct inspections and monitoring in connection with the Permits in accordance with the ESA and its implementing regulations (50 C.F.R. § 13.47).

- Review MSGCP Farm Plans, GCP site plans, and Permit applications after recommendation by FCCD; approve permits as appropriate.
- Maintain a record of the number of Permittees, acreages covered, and amount of incidental take and habitat loss for each local Permittee.
- Review monitoring and implementation reports for adequacy and compliance with MSGCP expectations.
- Review changed circumstances and unforeseen circumstances and address as described in the MSGCP.

4.3—Bureau of Land Management

- Retain ownership in and to the extent possible, support the consolidation of ~~consolidate~~ public ownership into the Moses Coulee Management area.
- Subject to the availability of federal appropriations and resources, survey and document ranges, populations, and habitats for Covered Species.
- Subject to the availability of federal appropriations and resources, apply integrated pest-management practices to control unwanted vegetation on public lands.
- Provide technical assistance (site preparation, plan materials, and planting techniques) to the IM Committee for habitat enhancement or restoration practices.
- Manage agency-owned or controlled lands in accordance with the Spokane Resource Management Plan (1992) or revisions of the plan. Implement the BLM *National Sage-Grouse Habitat Conservation Strategy* or future revisions, and as appropriate, consider ~~follow~~ management guidelines provided by State agencies (such as the WDFW *Greater Sage-Grouse Recovery Plan* (Stinson et al., 2004)).
- Coordinate with and provide technical assistance to the IM Committee on issues including, but not limited to, the development and implementation of the Adaptive Management/Monitoring Program, and on collection, reviewing, and evaluating data for covered species.
- Coordinate with WDFW and USFWS on MSGCP Covered Species issues in Douglas County.

4.4—The Nature Conservancy (TNC)

- Collaborate with the USFWS, WDFW, BLM, and others where appropriate to provide sites for reintroducing federally endangered Columbia Basin pygmy rabbits or other covered species as appropriate and feasible.
- Provide information about the MSGCP as appropriate and feasible in organizational publications.

- Assist in exporting "lessons learned" through the MSGCP to other communities and landscapes as appropriate in north-central Washington and beyond.
- Promote and make available to the MSGCP program research findings as appropriate related to the Covered Species and their habitats.
- Continue work with agencies and cooperating private landowners by monitoring species and community conditions as funding allows.
- Continue to coordinate with ongoing species and community inventory and analysis as funding allows.
- Restrict public use of TNC owned lands in the area where appropriate in cases where such use poses a significant threat to habitat, ongoing research, or safety.
- Share relevant research results related to habitat restoration, including livestock grazing, weed control, and other land-management methods.
- Continue collaboration with the USFWS, Douglas County Coordinated Weed Management Area, FCCD, and others to coordinate efforts for eradicating invasive weeds (unwanted vegetation) on public and private lands.
- Continue TNC efforts to develop and/or increase shrub-steppe restoration capacities.
- Protect and manage TNC properties in the area as HCA lands, where appropriate.
- Cooperate with and provide technical assistance to the IM Committee including assistance in the development and implementation of the Adaptive Management/ Monitoring Program and the review and evaluation of and/or assistance in collection of data for Covered Species.
- Coordinate with BLM, WDFW, USFWS, WDNR, and others on MSGCP species issues in Douglas County.
- Consider additional property acquisition as appropriate to ensure protection and enhancement of the HCA lands.

4.5—Foster Creek Conservation District (FCCD)

- Implementation expectations for the FCCD as described in Chapter 4 of the MSGCP.

5.0—Funding

Funding for FCCD is addressed within the MSGCP in Chapter 4. The FCCD will explore all potential funding sources, including, but not limited to Federal and State agencies, conservation organizations, and private industry.

Each signee agrees that it shall request adequate funding and workload prioritization to allow the signee to assist in MSGCP implementation and/or to fully operate, manage, maintain, and monitor its lands to support Covered Species.

The signees agree that this Memorandum is designed to set the overall stage for their cooperation with respect to the MSGCP. The signees intend, however, that nothing in this Memorandum shall obligate any of them to expend or provide specific funds or staffing, to apply for any specific grant, or to take any other specific action(s), beyond the general consultation and cooperation mentioned above, and that any specific funding, staffing, or other obligations of a Party in furtherance of the goals of this Memorandum may be created only pursuant to a further written agreement which is signed by all of the affected parties. The signees acknowledge and agree that, since each of them has its own mission, internal policies, and financial and other concerns and must remain free to take such steps as it may deem appropriate from time to time: (i) each of them shall remain completely free to decide whether or not specific activities contemplated with respect to the MSGCP are appropriate for its mission at any given time, or with respect to any given project which may be proposed, and nothing in this Memorandum does or shall bind them in any manner to participate in any specific project; and (ii) each of them shall likewise be free to engage in any activities which it may deem to be appropriate from time to time, whether or not they are of a type similar to the activities contemplated in this Memorandum, in cooperation with such persons or entities as they may choose, without any obligation to involve any other signee to this Memorandum in any of such activities. However, notwithstanding this paragraph, failure of a party to implement responsibilities required of it by the MSGCP or any federal permit may be grounds for revocation or termination of the MSGCP or permit(s).

The signees also agree that no partnership, joint venture, or agency is intended to be, nor shall it be, established by this Memorandum; that no signee of this Memorandum is authorized or empowered to act as an agent or any other kind of representative of any other signee, or to transact business or incur obligations in the name of any such other signee or for the account of such other signee; and that no signee of this Memorandum shall be in any manner or to any extent bound by or responsible for any acts, representations, or conduct of any other signee of this Memorandum. The signees agree further that, except to the extent (if any) otherwise explicitly stated in a subsequent agreement by or among them, each of them shall retain full responsibility for: (1) any and all payments due to its own employees or agents, whether denominated as salaries, stipends, contract payments, or otherwise; (2) any and all applicable health care coverage, worker's compensation insurance, other insurance, and other benefits for its employees or agents; (3) any and all travel, expense, or other reimbursements due to its employees or agents; (4) any and all claims by or with respect to its employees or agents, or their actions, whether related to damage or injury to persons or property, or otherwise; and (5) ensuring compliance by its employees and agents with applicable federal, state. and local statutes, laws, ordinances, rules, regulations, court orders, and other governmental requirements, including (but not limited to) the obtaining and maintaining in force of any and all required permits and or licenses.

IN WITNESS WHEREOF, THE PARTIES HERETO HAVE EXECUTED THE Memorandum, on the date(s) set forth below, as the day and year first above written.

By

Washington Fish and Wildlife Office, Manager U.S. Fish and Wildlife Service	Date

By

Washington State Director The Nature Conservancy	Date

By

Spokane District Manager Bureau of Land Management	Date Date

By

Regional Director, Region 2 Washington Department of Fish and Wildlife	Date

By

Foster Creek Conservation District Waterville, Washington	Date

Douglas County Multiple Species General Conservation Plan

Appendix B: GCP Site Plan Checklist

GCP Site Plan Checklist for Information to Include with Permit Application for Douglas County Multiple Species General Conservation Plan

The property described in the attached MSGCP GCP site plan, within the boundaries of Douglas County, Washington, is owned or leased by [*Landowner/lessee's name*] and is included within the scope of the Douglas County MSGCP.

The Applicant understands the attached GCP Site Plan and agrees to undertake and comply with agricultural BMPs and additional measures set forth in the MSGCP, the Incidental Take Permit, and the GCP site plan. As such, he/she agrees to permit representatives of the FCCD to enter specific properties at reasonable times with prior approval to ascertain compliance with the MSGCP and their individual agreements.

Nothing in this GCP site plan limits the Applicant/Permittee's right to acquire or lease additional lands. Any lands acquired after the date on this agreement will not be covered the GCP site plan is amended. Transfer of ownership or control of covered lands would also require amendment of the GCP site plan.

[*Landowner/lessee's name*] guarantees that he/she is the owner and/or lessee of the property and warrants, to the best of his/her knowledge, that there are no outstanding rights that will interfere with implementation of the GCP site plan.

GCP site plan Checklist

At a minimum, each GCP site plan for enrolled lands must include the following:

Site Description

- ☐ Applicant's name, address, phone number, and/or other contact information.
- ☐ Legal description of property to be enrolled. Accurately identify the property to be enrolled under this Agreement by providing a legal description and map of property boundaries, listing total acreage, delineating existing habitat conditions, and documenting ownership, management, and lease authorities, as applicable.
- ☐ Vicinity map and directions to the property from a major highway or road.
- ☐ Site map(s) of the property, with portions of the property to be enrolled delineated.
- ☐ Representative photos of the enrolled property, with photo locations identified on site map.
- ☐ Description of current and recent land-use practices on the enrolled land, with descriptions of site and habitat conditions.
- ☐ Information about any Covered Species and their habitats that may occur on the enrolled property or in areas that may be affected by Covered Activities.

Implementation Plan

- ☐ Descriptions of the specific actions to be implemented on the enrolled property, with a timeline for implementation and the responsible party or parties for each action. This should be clearly spelled out in the Farm Plan and/or GCP site plan with measures as required per the MSGCP.
- ☐ Description of costs and funding sources for actions to be implemented on the enrolled property
- ☐ List of covered species affected or taken, and habitat quantities or quality affected or taken.
- ☐ Description of how/when site-specific monitoring or reporting will occur.

By _____ _____

Foster Creek Conservation District — Date

Waterville, Washington

By _____ _____

Signature of Applicant — Date

By _____ _____

[*Additional parties, optional*] — Date

Douglas County Multiple Species Conservation Plan

Appendix C: MSGCP Development Process

Planning Process Participants

This MSGCP has been prepared under the leadership of the Foster Creek Conservation District with cooperation or assistance from the following agencies, organizations, and interested parties. These entities were members of the Technical Advisory Committee (TAC) and/or the Private Landowner Committee (PLC). They include:

- U.S. Fish and Wildlife Service (USFWS)—TAC
- National Marine Fisheries Service (NMFS)—TAC
- Bureau of Land Management (BLM)—TAC
- Natural Resource Conservation Service (NRCS)—TAC
- Farm Service Agency (FSA)—TAC
- U.S. Army Corps of Engineers (ACE)—TAC
- Washington State Department of Fish and Wildlife (WDFW)—TAC
- Washington State Department of Natural Resources (WDNR)—TAC
- Douglas County Public Utility District (DCPUD)—TAC
- Foster Creek Conservation District (FCCD)—TAC, PLC
- South Douglas Conservation District (SCUD)—PLC
- Douglas County Cattlemen (DCC)—PLC
- Douglas County Association of Wheat Growers (DCAWG)—PLC
- Chelan-Douglas County Farm Bureau (CDFB)—PLC
- Audubon Washington (Audubon)—PLC
- The Nature Conservancy (TNC)—TAC
- Washington State Horticultural Association (WHA)—PLC

Hereafter, the Douglas County Conservation Districts and MSGCP Applicants are referred to as the "Planning Team."

Planning History

In the fall of 1999, the Planning Team embarked on an effort to investigate the level of interest among Douglas County agricultural producers in participating in the development of a habitat conservation plan for application of a Section 10(a) (Section 10) permit under the ESA. With this goal in mind, the Planning Team began organizing and advertising meetings to educate all stakeholders and private landowners regarding the implications of obtaining a Section 10 permit under the ESA for agricultural activities in Douglas County. Funding for the draft habitat conservation planning effort was obtained from a USFWS ESA Section 6 HCP Planning Assistance grant to the FCCD. Local citizens and agency staff worked closely to develop and plan for implementation of this MSGCP.

In 1998, the FCCD Board of Supervisors became concerned about the potential for regulation of agricultural activities as a consequence of recent and proposed listings of wildlife species under the ESA. Although effects on agricultural activities in Douglas County were not significant at the time, wildlife listings were impacting landowners elsewhere in the Pacific Northwest. Several species in Douglas County were already federally designated as Candidates or Species of Concern under the ESA. This indicated there was a reasonable possibility that additional wildlife species occurring in Douglas County would be designated as Endangered or Threatened under the ESA.

Landowners recognized that should species become listed under ESA, regulatory actions might be implemented in Douglas County. These potential regulatory actions could significantly reduce or delay a landowner's ability to successfully continue agricultural production and management activities. Douglas County wildlife species that potentially could be listed as endangered or threatened under ESA include greater sage-grouse, sharp-tailed grouse, or Washington ground squirrels. The Columbia Basin pygmy rabbit was listed as Endangered in 2003, pursuant to the ESA (68 FR 10388).

One FCCD board member became aware of the 1995 *Atwater Prairie Chicken Habitat Conservation Plan* developed in Texas to provide a Safe Harbor agreement for private landowners. The FCCD decided to pursue the HCP concept for applicability to the FCCD and perhaps the entire County. A letter was sent to USFWS in May of 1999 requesting support in the development of an HCP for Douglas County, Washington. As a result of this action, FCCD appointed two board supervisors to represent the board and oversee the HCP process.

Alternatives Analyzed During GCP Development

Often HCPs evaluate a "no take" alternative. A conservative "no take" alternative would likely require large seasonal or permanent buffers around covered species habitats that would not allow necessary farming activities, and therefore was not economically feasible. At various times during the GCP development process the FCCD considered other approaches, briefly described below:

1. One alternative was a wildlife-corridors approach, but it was likely to have extremely unequal impact to farmers depending on location of corridors. Some farmers would be unlikely to sign up and therefore this approach would not meet the purpose and need.
2. Another alternative included listed fish as covered species under the GCP. The FCCD seriously considered this approach but slow progress on the development of a conservation strategy caused the FCCD to eliminate this alternative in order to focus on the terrestrial-species alternatives.
3. The FCCD also considered a programmatic HCP where they would hold the incidental take permit, and issue certificates of inclusion to individual landowners. After discussions with the USFWS, the FCCD agreed to use the General Conservation Plan Process.

4. The FCCD also explored an expanded MSGCP that conserves or restores about 50 percent of the eligible lands of Douglas County in a CRP/SAFE-like condition. This alternative is explored further in the Environmental Assessment, along with the no action and proposed action alternatives. The expanded MSGCP alternative did not have a funding mechanism for implementation.
5. The FCCD and USFWS explored coverage of 17 species. Eventually the FCCD and USFWS decided to focus on the four species about which we have the most knowledge on populations, distribution, effects, and potential measures to minimize and mitigate the effects. Narrowing the list of species will also simplify MSGCP implementation and monitoring. Those species not selected for inclusion as covered species in the final conservation plan are described in Appendix J.

Covered Species Selection

Initially, the FCCD and the Planning Team reviewed the wildlife species that could occur in the county, as below in Tables C-1a to C-1d (USBLM 2005).

Tables C-1a to C-1d: Wildlife Species Most Likely Existing in Douglas County

C-1a: Birds	
Common Name	**Scientific Name**
American Coot	*Fulica americana*
American Crow	*Corvus brachyrhynchos*
American Dipper	*Cinclus mexicanus*
American Goldfinch	*Carduelis tristis*
American Kestrel	*Falco sparverius*
American Robin	*Turdus migratorius*
American Tree Sparrow	*Spizella arborea*
Bank Swallow	*Riparia riparia*
Barrow's Goldeneye	*Bucephala islandica*
Belted Kingfisher	*Ceryle alcyon*
Black-billed Magpie	*Pica pica*
Black-capped Chickadee	*Poecile atricapilla*
Black-crowned Night Heron	*Nycticorax nycticorax*
Bohemian Waxwing	*Bombycilla garrulus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brewer's Sparrow	*Spizella breweri*
Brown Creeper	*Certhia americana*
Brown-headed Cowbird	*Molothrus ater*
Bufflehead	*Bucephala albeola*

C-1a: Birds	
Common Name	**Scientific Name**
Burrowing Owl	*Athene cunicularia*
Cackling Goose	*Branta hutchinsii*
California Gull	*Larus californicus*
California Quail	*Callipepla californica*
Canada Goose	*Branta canadensis*
Canvasback	*Aythya valisineria*
Canyon Wren	*Catherpes mexicanus*
Cedar Waxwing	*Bombycilla cedrorum*
Chestnut-backed Chickadee	*Poecile rufescens*
Chukar Partridge	*Alectoris chukar*
Common Goldeneye	*Bucephala clangula*
Common Loon	*Gavia immer*
Common Raven	*Corvus corax*
Cooper's Hawk	*Accipiter cooperii*
Dark-eyed Junco	*Junco hyemalis*
Double-crested Cormorant	*Phalacrocorax auritus*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus tyrannus*
Eurasian Widgeon	*Anas penelope*
European Starling	*Sturnus vulgaris*
Ferruginous Hawk	*Buteo regalis*
Fox Sparrow	*Passerella iliaca*
Gadwall	*Anas strepera*
Golden Eagle	*Aquila chrysaetos*
Golden-crowned Kinglet	*Regulus satrapa*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Grasshopper Sparrow	*Ammodramus savannarum*
Great Blue Heron	*Ardea herodias*
Great Horned Owl	*Bubo virginianus*
Greater Sage-grouse	*Centrocercus urophasianus*
Greater Scaup	*Aythya marila*
Green-wing Teal	*Anas crecca*
Gyrfalcon	*Falco rusticolus*
Hairy Woodpecker	*Picoides villosus*
Hermit Thrush	*Catharus guttatus*

C-1a: Birds	
Common Name	**Scientific Name**
Herring Gull	*Larus argentatus*
Hooded Merganser	*Lophodytes cucullatus*
Horned Grebe	*Podiceps auritus*
Horned Lark	*Eremophila alpestris*
House Finch	*Carpodacus mexicanus*
House sparrow	*Passer domesticus*
Killdeer	*Charadrius vociferus*
Lark Sparrow	*Chondestes grammacus*
Lesser Scaup	*Athyya affinis*
Loggerhead Shrike	*Lanius ludovicianus*
Long-billed Curlew	*Numenius americanus*
Long-eared Owl	*Asio otus*
Mallard	*Anas platyrhynchos*
Marsh Wren	*Cistothorus palustris*
Merlin	*Falco columbarius*
Mourning Dove	*Zenaidura macrouva*
Mountain Chickadee	*Poecile gambeli*
Northern Bald Eagle	*Haliaeetus leucocephalus*
Northern Flicker	*Volaptes auratus*
Northern Harrier	*Circus cyaneus*
Northern Pygmy Owl	*Glaucidium californicum*
Northern Saw-whet Owl	*Aegolius acadicus*
Northern Shoveler	*Anas clypeata*
Northern Shrike	*Lanius excubitor*
Pied-billed Grebe	*Podilymbus podiceps*
Pine Grosbeak	*Pinicola enucleator*
Pine Siskin	*Carduelis pinus*
Prairie Falcon	*Falco mexicanus*
Prairie Falcon	*Falco mexicanus*
Pygmy Nuthatch	*Sitta pygmaea*
Red-breasted Nuthatch	*Sitta canadensis*
Redhead	*Aythya americana*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Ring-billed Gull	*Larus delwarensis*

C-1a: Birds	
Common Name	**Scientific Name**
Ring-necked	*Aythya collaris*
Ring-necked Pheasant	*Phasianus colchicus*
Rock Pigeon	*Columba livia*
Rock Wren	*Salpinctes obsoletus*
Rough-legged Hawk	*Buteo lagopus*
Ruby-crowned Kinglet	*Regulus calendula*
Ruddy Duck	*Oxyura jamaicensis*
Sage Sparrow	*Amphispiza belli*
Sage Thrasher	*Oreoscoptes montanus*
Say's Phoebe	*Sayornis saya*
Sharp-shinned Hawk	*Accipiter striatus*
Short-eared Owl	*Asio flammeus*
Snow Bunting	*Plectrophenax nivalis*
Song Sparrow	*Melospiza melodia*
Spotted Towhee	*Pipilo maculates*
Steller's Jay	*Cyanocitta stelleri*
Swainson's Hawk	*Buteo swainsoni*
Townsend's Solitaire	*Myadestes townsendi*
Varied Thrush	*Ixoreus naevius*
Vesper Sparrow	*Pooecetes gramineus*
Western Bluebird	*Sialia mexicana*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
White-breasted Nuthatch	*Sitta carolinensis*
White-crowned Sparrow	*Zonotrichia leucophrys*
White-throated Swift	*Aeronautes saxatalis*
Winter Wren	*Troglodytes troglodytes*
Yellow-rumped Warbler	*Dendroica coronata*

C-1b: Mammals	
Common Name	**Scientific Name**
Badger	*Taxidea taxus*
Bobcat	*Lynx rufus*
Coyote	*Canis latrans*
Fringed Myotis	*Myotis thysabides*

C-1b: Mammals	
Common Name	**Scientific Name**
Great Basin Pocket Mouse	*Perognathus parvus*
Least Chipmunk	*Tamius minimus*
Merriam's Shrew	*Sorex merriami*
Mule deer	*Odocoileus hemionus*
Northern Grasshopper Mouse	*Onychomys leucogaster*
Nuttail's Cottontail	*Sylvilagus nuttallii*
Pallid Bat	*Antrozous pallidus*
Porcupine	*Erethizon dorsatum*
Columbia Basin pygmy rabbit	*Brachylagus idahoensis*
Sagebrush Vole	*Lemmiscus curtatus*
Spotted Bat	*Euderma maculatum*
Washington Ground Squirrel	*Spermophilus washingtoni*
Western Harvest Mouse	*Reihrodontomys megalotis*
Western Pipistrelle	*Pipistrellus Hesperus*
Western Small-footed Myotis	*Myotis ciliolabrum*
White-tailed Jack Rabbit	*Lepus townsendii*
Yellow-bellied Marmot	*Marmota flaviventris*
Yuma Myotis	*Myotis yumanesis*

C-1c: Reptiles	
Common Name	**Scientific Name**
Common Side-blotched Lizard	*Uta stansburiana*
Gopher Snake	*Pituophis catenifer*
Night Snake	*Hypsiglena torquata*
Racer	*Coluber constrictor*
Sagebrush Lizard	*Sceloporus gracious*
Short-horned Lizard	*Phrysonoma douglassii*
Western Rattlesnake	*Crotalus virdis*

C-1d: Amphibians	
Common Name	**Scientific Name**
Great Basin Spadefoot	*Scaphiopus intermountanus*
Pacific Treefrog	*Pseudacris regila*

Species Selected as Covered Species

After review of species in Douglas County, the Private Landowner Committee and Technical Advisory Committee selected Covered Species based on a decision matrix that included:

1. Is the species listed likely to be listed pursuant to the Endangered Species Act of 1973 (ESA) (16 U.S.C. §§1531-1544)?
2. Is the species found in Douglas County in areas where it could be significantly impacted by agricultural activities?
3. Does the species utilize agricultural areas of Douglas County for significant portions of its life cycle?
4. Is there sufficient research available that would indicate what management actions would benefit the species?

Through the selection process, four species were chosen for inclusion in the MSGCP as Covered Species. They are listed in the table below.

Table C-2: Species Selected as Covered Species

Common Name	**Scientific Name**	**Status[1]**
Columbia Basin pygmy rabbit	*Brachylagus idahoensis*	SE, FE
Washington Ground Squirrel	*Urocitellus washingtoni*	SSC, FC
Columbian Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*	ST, FSC
Sage Grouse	*Centrocercus urophasianus*	ST, FC

[1]ST—State Threatened, SSC—State Species of Concern, SE—State Endangered, FSC—Federal Species of Concern, FC—Federal Candidate, FE—Federal Endangered

Species Considered But Not Included as Covered Species

Species that were considered more closely, but were not included as Covered Species are shown in Table C-3. This list includes some “species of concern” (a generic term for species that agencies are concerned about) for eastern Washington that were not initially included in Tables C-1a to C-1d, including some plants.

Table C-3: Species Considered But Not Included as MSGCP Covered Species

Species	Status[1]	Species	Status[1]
Birds		**Mammals**	
Common Loon	SS	Merriam's Shrew	SC
Great Blue Heron	SM	Yuma Myotis	
Black-Crowned Night Heron	SM	Fringed Myotis	SM
Trumpeter Swan		Small-Footed Myotis	
Tundra Swan		Long-Eared Myotis	
Osprey	SM	Long-Legged Myotis	
Swainson's Hawk	SM	Spotted Bat	SM
Northern Goshawk	SC, FSC	Townsend's Big-Eared Bat	SM, FSC
Blue Grouse		Pallid Bat	SM
Sandhill Crane	SE	Hoary Bat	
Long-Billed Curlew	SM	Sagebrush Vole	SM
Black Tern	SM	Northern Grasshopper Mouse	SM
Flammulated Owl	SC	Black-Tailed Jack Rabbit	SC
Pileated Woodpecker	SC	White-Tailed Jackrabbit	SC
White-Headed Woodpecker	SC	**Fish**	
Olive-Sided Fly Catcher		White Sturgeon	
Mountain Bluebird		River Lamprey	SC, FSC
Western Bluebird	SM	Sockeye Salmon	
Lark Sparrow		Coho Salmon	
Bald Eagle	SS	Redband Trout	
Brewer's Sparrow		Westslope Cutthroat Trout	
Burrowing Owl	SC, FSC	Mountain Whitefish	
Golden Eagle		**Reptiles**	
Grasshopper Sparrow	SM	Striped Whipsnake	SC
Lewis' Woodpecker	SC	Sagebrush Lizard	SC, FSC
Loggerhead Shrike	SC, FSC	**Plants**	
Peregrine Falcon	SS, FSC	Ute Ladies-Tresses	SE, FT
Prairie Falcon	SM	Gray Crypthntha	SS, FSC
Sage Sparrow	SC	Chelan Rockmat	SE, FSC
Sage Thrasher	SC	Sticky Phacelia	ST, FSC
Willow Flycatcher		Thompson's Clover	ST, FSC
Mollusks		**Amphibians**	
California Floater	SC, FSC	Northern Leopard Frog	SE, FSC

[1]SS—Sensitive Species, SM—State Monitored, SSC—State Species of Concern, SC—State Candidate, SE—State Endangered, FSC—Federal Species of Concern, FT—Federal Threatened

Desired Future Conditions

Twelve Desired Future Conditions (DFCs) were identified through public and agency inputs. These DFCs address Douglas County agency and resident concerns for Covered Species and related habitat. The DFCs were used in the MSGCP development and reflect the goals of these agencies and residents to move wildlife habitat and management in a positive direction.

1. The County is in compliance with the requirements of the ESA, as amended, most particularly Section 10(a)(1)(B).
2. Stable or increasing populations (numbers and distribution of reproductive individuals) of the Covered Species are maintained.
3. Suitable habitat conditions for species (flora and fauna) exist to maintain biodiversity. This action includes maintaining the diversity of natural genes, species, and ecosystems consisting of a mosaic of plant communities with diverse forbs, grasses, and shrubs, as well as the evolutionary processes that link them across the County.
4. The landscape supports ecological and economic viability for the agricultural operators within the County.
5. Surface and ground waters remain in sufficient quantity and distribution and of high quality to meet existing and desired future needs of wildlife as well as human residents.
6. Landscape hydrologic performance and processes sustain the water, soil, and other resources including wildlife habitat.
7. Species corridors and increased habitat connectivity are created and maintained through active landowner participation in the MSGCP.
8. Wetlands, riparian, and aquatic ecosystems are protected as natural, functioning systems. Protection activities are initiated on those systems that have lost this natural functioning condition to prevent further degradation. Voluntary restoration actions are promoted and encouraged.
9. The long-term productivity and stability of the County's soil resource is maintained.
10. The uncertainty associated with regulatory requirements of agricultural operations is minimized through long-term planning, including assurances in the form of a permit for incidental take of Covered Species.
11. On-going dialog is maintained within the County between participating landowners; county, State, and Federal agencies; and other interested parties that provides a communication channel for cooperative/collaborative learning and problem solving, adaptive management, and positive proactive leadership.
12. The quality of life for all residents of Douglas County (rural, suburban, and urban) is maintained and enhanced through the maintenance of natural and agricultural open lands.

Conservation Planning Principles

The Douglas County MSGCP was developed to achieve the following goals:

1. Foster good land stewardship in Douglas County.
2. Assist landowners in meeting requirements of ESA (most particularly those requirements in Section 10(a) for incidental take permits).

The Planning Team wanted a MSGCP that would do the following:

1. Reduce the likelihood of the listing of additional species located in Douglas County while incorporating and appropriately applying relevant conservation theory and practice.
2. Balance the needs of the Covered Species and the ecosystem habitats that sustain them.
3. Stay within regulatory and policy guidelines as well as implementation management constraints (i.e., budget limitations).

The following conservation principles have been followed during the planning process for development of the MSGCP. This is not an exhaustive list, but it does represent the primary tenets of current conservation practice and theory that have been incorporated into the MSGCP.

1. *Distribution*. The MSGCP will provide goals and objectives to maintain the current spatial distribution and improve the overall quality of shrub-steppe habitat. The MSGCP will prioritize retention of shrub-steppe and supporting habitat (such as CRP/SAFE) in areas already used by Covered Species. The MSGCP will support existing important habitats already provided in the County by TNC, WDFW, U.S. Army Corps of Engineers, etc.
2. *Edge and Fragmentation*. Habitat patches that minimize edge-to-area ratios are often superior to those that do not. Habitat that occurs in less fragmented, continuous blocks are often preferable to habitat that is fragmented. Thus, the MSGCP will emphasize retention of habitat blocks and CRP/SAFE blocks adjacent to existing native habitats, especially adjacent to large blocks of habitat on TNC, BLM, WDNR, and WDFW lands.
3. *Linkage and Proximity*. Interconnected blocks of habitat in close proximity are often better than isolated blocks. Corridors or linkages function better when the habitat within them is represented by protected, preferred habitat for the target species. The MSGCP will emphasize retention of native fragments and CRP/SAFE lands where those areas help provide linkage to other areas, especially TNC, BLM, WDNR and WDFW lands.
4. *Management*. The MSGCP will include BMPs which allow farms to be managed with good stewardship. This is especially relevant to grazing lands, where practices should result in increased quality of shrub-steppe, thereby benefiting Covered Species through better habitat and linkage. NRCS CP standards will provide the framework for site-specific BMPs.

6. *Invasive Species*. Habitat areas without significant populations of invasive plant or wildlife species are more easily managed for their native species than areas with invasive species. The MSGCP incorporates BMPs to minimize introductions and control existing populations of invasive weed species.
7. *Rarity and Habitat Conservation Areas*. Some of our Covered Species are very rare, including the Columbia Basin pygmy rabbit. Areas necessary for pygmy rabbit recovery should be recognized in the MSGCP. The pygmy rabbit is a small and isolated species, and habitat for recovery activities is maintained in Douglas County by WDFW. Elsewhere in the Plan Area, pygmy rabbit habitat should be maintained to provide additional prospective habitat in the event of catastrophic habitat loss.
8. *Size*. Large blocks of habitat containing large populations of the target species are often superior to small blocks of habitat containing small populations. The large blocks of habitat in Douglas County are often provided in HCAs. The agriculture landowners can best contribute to Covered Species conservation by implementing BMPs which improve the habitat quality between and adjacent to those large blocks of habitat, and by eliminating conversion of Covered Species habitats where they occur on agricultural lands.

Land Uses, Conservation Issues, and Management Strategies

After reviewing the desired future conditions and the conservation planning principles, the PLC and TAC reviewed the three major land uses and explored conservation issues and management strategies to work toward development of BMPs (described in detail in Appendix E). Some of the issues were also appropriate for the USFWS to consider during development of the environmental assessment (a separate National Environmental Policy Act document.)

Dryland Agriculture

Cultivated drylands in Douglas County include lands planted in small grains—predominately winter and spring wheat, with some canola, rapeseed, or legumes.

Conservation Issues

1. Direct take of species/habitat.
2. Indirect take of species by habitat modification.
3. Lack of natural yearly cover.
4. Displacement of wildlife species.
5. Decreased habitat diversity since European settlement.
6. Increased habitat fragmentation since European settlement.
7. Presence of non-native plant species.
8. Intermittent land disturbance by equipment and cropping.

Management Strategies

1. Minimize disturbance to Covered Species habitat through temporal or spatial buffers.
2. Provide habitat for food and escape cover for wildlife.
3. Reduce soil loss due to wind, water, and concentrated flow erosion.
4. Minimize non-target impacts of fertilizers, herbicides, and insecticides.
5. Protect remaining shrub-steppe habitat.

Rangeland

Rangeland is a general term for areas that do not support trees as a general cover type, but may support grass, forbs, and shrubs individually or in various combinations, depending on annual rainfall amount and timing. Shrub-steppe is a specific type of rangeland, usually dominated by one or several large shrubs and with an understory dominated by perennial grasses and forbs. Many areas meet shrub-steppe criteria, but because of disturbance, now have somewhat different characteristics than the original. They may or may not be currently classified as Shrub-steppe. Nearly all dryland areas within the County that do not support trees and are not cultivated are rangeland.

Conservation Issues

1. Direct take of species and habitat.
2. Conversion of shrub-steppe to other land uses.
3. Loss or degradation of riparian habitat.
4. Species and habitat losses or disturbances due to hunting and recreation.
5. Wildfire risk.
6. Use of chemicals.
7. Fences constraining grazing and movement of native animals.
8. Transmission of parasites and diseases from domestic to native animals.
9. Displacement of wildlife species.
10. Loss of habitat potential for wildlife.
11. Increased habitat fragmentation.
12. Changes in wildlife-species composition.
13. Soil and crust compaction.
14. Changes in microclimate.
15. Changes in soil microbes.
16. Water development to maintain desired livestock distributions.
17. Disturbance caused by management activities.
18. Reduction of rangeland habitat units from unmanaged grazing.
19. Diminished water quality.

Management Strategies

1. Minimize disturbance to Covered Species habitat through temporal and spatial buffers.
2. Reduce habitat degradation through management of livestock use to sustain forage production and desired habitats.
3. No net loss of shrub-steppe rangeland habitat units.
4. Maintain and enhance riparian habitat to reach full site potential and function.
5. Minimize hunting and recreation impacts through education and traffic minimization.
6. Decrease risk of non-historic wildfire and develop plans to minimize direct take and loss of habitat.
7. Minimize use and concentration of chemicals or nutrients under all aspects of livestock production.
8. Minimize negative impacts of fences.
9. Minimize exchange of parasites and disease between livestock and wildlife.
10. Maintain habitat features in a suitable condition for Covered Species at appropriate seasons.

Irrigated Agriculture

Inland irrigated areas that exist in the Plan Area are generally used for forage crop production and are considered covered activities. Lands irrigated from the Columbia River are not included as covered activities under this MSGCP.

Conservation Issues

1. Direct take of the species/habitat.
2. Decreased habitat diversity caused by monoculture displacement of native plant species.
3. Change in wildlife species composition.
4. Increased habitat fragmentation.
5. Loss of site potential for wildlife due to lower native habitat diversity.
6. Disturbance of nest sites within irrigated crops.
7. Disturbances caused by management activities, noise pollution, and wind machines.
8. Concentrations of wildlife near food source.
9. Deterioration of air quality caused by burning.
10. Vertebrae pest control (i.e. mice, voles and gophers).
11. Presence of non-native or invasive plant species due to soil disturbance.
12. Water withdrawals/efficiency, groundwater pollution, salinization, increasing water present, impacts of runoff.
13. Chemical spray drift.
14. Lead and arsenic in soil from past pesticide applications.

Management Strategies

1. Maintain beneficial habitat conditions adjacent to and outside irrigated parcels.
2. Reduce desirability of irrigated parcels for nesting.
3. Minimize disturbance to Covered Species habitat through temporal or spatial buffers.
4. Minimize the attractiveness of wildlife to the irrigated crop.
5. Minimize air quality impacts from burning.
6. Minimize pest-control impacts to non-target species.
7. Minimize establishment and spread of undesirable invasive plants.
8. Encourage maximum benefit of water use.
9. Reduce negative impacts of chemical spray drift on non-target species.
10. Minimize lead and arsenic exposure when re-planting in certain locations (i.e. old orchards).

Douglas County Multiple Species Conservation Plan

Appendix D: Covered Species

Overview

This Appendix describes the life history and description, occurrence, distribution, and habitat requirements of the MSGCP's Covered Species. Additional information on Covered Species prepared by Andonaegui (2003) is on file at the Foster Creek Conservation District Office.

Covered Species: Groups

The four Covered Species were broken down into two groups (Table D-1) to facilitate defining species goals and overview analyses. BMPs and CPs developed in the MSGCP for the four covered species may also benefit non-covered fish and wildlife species (listed in Appendix C).

Table D-1: Covered Species Groups

Group #	Group Name	Covered Species
1	Burrowing mammals	Columbia Basin Pygmy Rabbit Washington Ground Squirrel
2	Shrub-steppe grouses	Columbian Sharp-tailed Grouse Greater Sage-grouse

The Covered Species groups are summarized briefly below. Each species is then described in detail in following sections.

Burrowing Mammals

Covered Species in the Burrowing Mammals group are most frequently found in soils deeper than 24 inches without impermeable layers within the soil profile. The Columbia Basin pygmy rabbit prefers sagebrush, particularly big sagebrush (*Artemisia tridentata*), growing in dense stands or clumps where an understory of perennial bunch grasses and forbs is also present. The Washington ground squirrel lives in sagebrush or grassland habitats in the Columbia River Basin of Washington and Oregon (Klein 2005).

Land use activities that result in soil and vegetation disturbance cause the most impact on habitat for ground species. Underground dens are often destroyed or damaged by tillage and/or motor vehicles passing over colonies (USFWS 2012). Implementation of the MSGCP includes vigorous efforts to protect known ground species colonies from these destructive land use activities. The goal of the MSGCP for ground species is to protect desired habitat on deep soils beneath big sagebrush (*Artemisia tridentata*) through the minimization of tillage and vehicle travel, and to maintain healthy stands of bluebunch wheatgrass (*Pseudoroegneria spicata*) and

rabbitbrush (*Chrysothamnus nauseosus*). In addition to areas on farms and ranches, HCAs within Douglas County offer the best opportunities to implement these practices in order to increase the populations of ground species.

Shrub-Steppe Grouses

Covered Species in this group are birds that are highly dependent upon shrub-steppe, meadow-steppe, and riparian habitat for reproduction, foraging, and winter habitat. Shrub-steppe plant species include three-tip sagebrush (*Artemisia tripartita*), big sagebrush (*Artemisia tridentata*), stiff sagebrush (*Artemisia rigida*), bitterbrush (*Purshia tridentata*), and rabbitbrush (*Chrysothamnus nauseosus*). Perennial and annual grasses species include bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), and Sandberg bluegrass (*Poa secunda*). Riparian zones are critical winter habitat for Columbian sharp-tailed grouse. In Douglas County, riparian zones normally include the following shrub and tree species: snowberry (S*ymphoricarpus albus*), wild rose (*Rosa* spp.), black hawthorn (C*rataegus douglasii*), hackberry (*Celtis reticulate*), cow-parsnip (*Heracleum lanatum*), common chokecherry (*Prunus virginiana*), bittercherry (*Prunus emarginata*), mock orange (*Philadelpus lewisii*), red osier dogwood (*Cornus stolonifera*), water birch (*Betula occidentalis*), willow (*Salix* spp.), black cottonwood *(Populus trichocarpa*), and quaking aspen (*Populus tremuloides*) (Daubenmire 1968; 1970).

The greater sage-grouse and the Columbian sharp-tailed grouse require large expanses of relatively undisturbed shrub-steppe habitat. Shrub-steppe habitat in Douglas County has improved over the past twenty years through the implementation of the CRP/SAFE (Schroeder and Vander Haegen 2006). Desirable areas of shrub-steppe habitat have emerged and are maturing on these CRP/SAFE lands. Implementation of the MSGCP will further supplement the CRP/SAFE program to provide quality habitat for sage bird species. Therefore, the goal of the MSGCP is to continue further development and protection of high quality shrub-steppe habitat, particularly among existing dryland and range agricultural operations.

Covered Species: Descriptions and Habitat Requirements

Columbia Basin Pygmy Rabbit *(Brachylagus idahoensis)*
Status: Federal Endangered, State Endangered

The Columbia Basin pygmy rabbit (pygmy rabbit) is one of only two rabbit species in North America to dig its own burrow. The pygmy rabbit differs significantly from species within the *Lepus* or *Sylvilagus* genera and is generally considered part of the monotypic genus *Brachylagus* (USFWS 2012).

Physical Description

The Columbia Basin pygmy rabbit is the smallest leporid in North America, with mean adult weights from 375 to about 500 grams (0.8 to 1.1 pounds), and a body length from 23.5 to 29.5 centimeters (9.25 to 11.5 inches); females are slightly larger than males. The pygmy rabbit is distinguishable from other leporids by its small size, short ears, gray color, small hind legs, and lack of white fur on the tail (WDFW 1995a).

Life History

Columbia Basin pygmy rabbits are capable of breeding during their second spring or summer. In Washington, breeding occurs from January to June. Gestation lasts 22 to 24 days. Young are born in natal burrows constructed by the female shortly before parturition. Litter size ranges from four to eight. Females may produce up to four litters per year (WDFW 1995a; USFWS 2012).

Columbia Basin pygmy rabbits have a lower potential for rapid increase in numbers than other Leporids. They do not appear to produce extra litters in response to favorable environmental conditions. Adult mortality is highest in January through March. Juvenile survival is initially low with up to 50 percent mortality during the first 5 weeks after birth. Predation is the leading cause, but starvation and environmental stress are also significant factors. Predators of Columbia Basin pygmy rabbits include coyote (*Canis latrans*), badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), great-horned owl (*Bubo virginianus*), short-eared owl (*Asio flammeus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), and golden eagle (*Aquila chrysaetos*) (USFWS 2012).

Habitat Requirements

Columbia Basin pygmy rabbit distribution is highly dependent upon the big sagebrush (*Artemisia tridenta*)/bluebunch wheatgrass (*Agropyon spicatum*) habitat type. This habitat type is characterized by four well-defined vegetation layers. The first consists of various shrub species, primarily big sagebrush (*Artemisia tridenta*), that are intermixed with second layer of tall perennial grasses, principally bluebunch wheatgrass (*Agropyon spicatum*). A low-lying layer of perennial and annual grasses and forbs, usually less than 4 inches in height, comprises the third layer. The fourth layer is a thin, fragile cryptogamic crust, which is located directly on the surface of the soil. Pygmy rabbits are extremely dependent on sagebrush to provide both food and shelter throughout the year (USFWS 2012).

In Washington, an analysis of burrows showed 96 percent occurred in soils greater than 20 inches deep and derived from loess (windblown parent material). In addition to the soil type and depth, micro-relief is important in burrow site selection. Burrow entrances are most often found at the base of sagebrush plants on slopes, mounds, or naturally occurring drainages. Pygmy rabbits do not move seasonally to use different habitats. During winter, snow burrows are excavated by the pygmy rabbits and utilized for foraging (WDFW 1995a).

In the winter, sagebrush comprises 99 percent of the pygmy rabbit's diet. Sagebrush continues to be the most important diet item (51 percent) followed by grasses (39 percent) and forbs (10 percent) in spring and summer (USFWS 2012).

Abundance and distribution of suitable habitat is the most significant limiting factor. Historically, conversion of shrub-steppe habitat for dryland grain production and intensive grazing led to the greatest loss of habitat. More frequent, intense wildfires have also negatively impacted significant areas of former pygmy rabbit habitat, as sagebrush is easily killed by fire (USFWS 2013). The majority of former Columbia Basin pygmy rabbit habitat in Washington has been altered to the point that it can no longer support this species (WDFW 1995a; USFWS 2012).

The pygmy rabbit is considered a shrub-steppe obligate species (WDFW 1995a). However, within the shrub-steppe ecosystem, populations are restricted to habitat characterized by deep soil and tall, dense stands of sagebrush (USFWS 2001). Historically, these local-scale habitats were likely uncommon and patchily distributed (WDFW 1995a). In Oregon, sites occupied by pygmy rabbits were typified by significantly greater mean soil depth (51.0 cm), mean soil strength of surface (0.8 kg/cm2), and subsurface horizons (3.8 kg/cm2) than unoccupied sites. Additionally, pygmy rabbits avoided areas with dense stands of cheatgrass (*Bromus tectorum*) (Weiss and Verts 1984).

Because Columbia Basin pygmy rabbits dig their own burrows, soil characteristics such as depth and structure are essential habitat features. At Sagebrush Flat most burrows (82 percent, n=165) were constructed on slopes less than five percent and on south and southwest aspects (63 percent, n=165) (Siegel Thines et al 2004). Approximately 77 percent of 80 active burrow sites were on a mound/ intermound or dissected topography (WDFW 1995a). An estimated 96 percent of burrows at Sagebrush Flat are constructed in areas where soil depth is greater than 51 centimeters (WDFW 1995a).

Presence of sagebrush cover is a requisite for pygmy rabbit habitat (WDFW 1995a). In southeastern Idaho, percent cover of sagebrush averaged 46 percent with a mean height of 56 centimeters (Green and Flinders 1980); in Oregon, percent cover of sagebrush averaged 29 percent, mean height 84 centimeters (Weiss and Verts 1984); and in Washington, percent cover of sagebrush averaged 33 percent, mean height 82 centimeters (Gahr 1993). In southeastern Idaho, burrow areas were characterized by significantly higher percent cover of big sagebrush (22 percent), total forbs (7 percent) and total live shrubs (29 percent), while percent soil surface litter was significantly lower than non-burrow areas (Heady 1998; Heady et al. 2001). Additionally, mean height and density of shrubs greater than 50 centimeters (20 inches) was significantly greater at burrow sites than points 5 meters (16 feet) from burrows (Heady 1998; Heady et al. 2001).

Columbia Basin pygmy rabbits remain on their home range during winter. In Idaho size of winter home ranges may be influenced more by cover than forage availability as areas occupied

by pygmy rabbits generally had significantly more shrubs, greater coverage of shrubs, and taller, wider shrubs than non-use areas (Katzner and Parker 1997). Pygmy rabbits selectively used dense, structurally diverse stands of big sagebrush; these areas also had greater snow accumulation (Katzner and Parker 1997). As total exposed food and vegetative cover decreased because of snow accumulation, pygmy rabbits in Idaho decreased the size of their home range and created extensive subnivean burrow systems, presumably to access food resources (Katzner and Parker 1997, Katzner et al. 1997).

Range and Distribution

The Columbia Basin pygmy rabbit utilizes appropriate shrub-steppe habitat across the Great Basin, including portions of California, Nevada, Utah, Wyoming, Idaho, Montana, Oregon, and Washington. The pygmy rabbit population in Washington has been disjunct from the remainder of the species' range for at least 7,000 to 10,000 years. Climate induced habitat changes probably account for the isolation of the Washington populations. During the first half of the 20th Century, the Columbia Basin pygmy rabbit occurred in portions of Douglas, Grant, Lincoln, Adams, Franklin, and Benton Counties (WDFW 1995a; USFWS 2012).

The Columbia Basin pygmy rabbit was presumed to be extirpated from Washington by the mid-20th century. However, the species was rediscovered in 1987. Five populations were known to exist in 1995 in Douglas and northern Grant Counties. A sixth population was documented in 1997. Between 1997 and 2001, five of the six populations disappeared. The sole remaining population was located at Sagebrush Flat. Wildfire played a role in the disappearance of one of the populations; others disappeared for unknown reasons. No pygmy rabbits had been documented at Sagebrush Flat since July 2004 until reintroduction and translocation efforts began (Hays 2001; USFWS 2012).

Douglas County Distribution

Within Douglas County, the Columbia Basin pygmy rabbit historically could have occurred in deep soils throughout the southeast half of the County (see Figure D-1). Figure D-2 displays the Habitat Suitability Index for potential habitats in Douglas County. The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

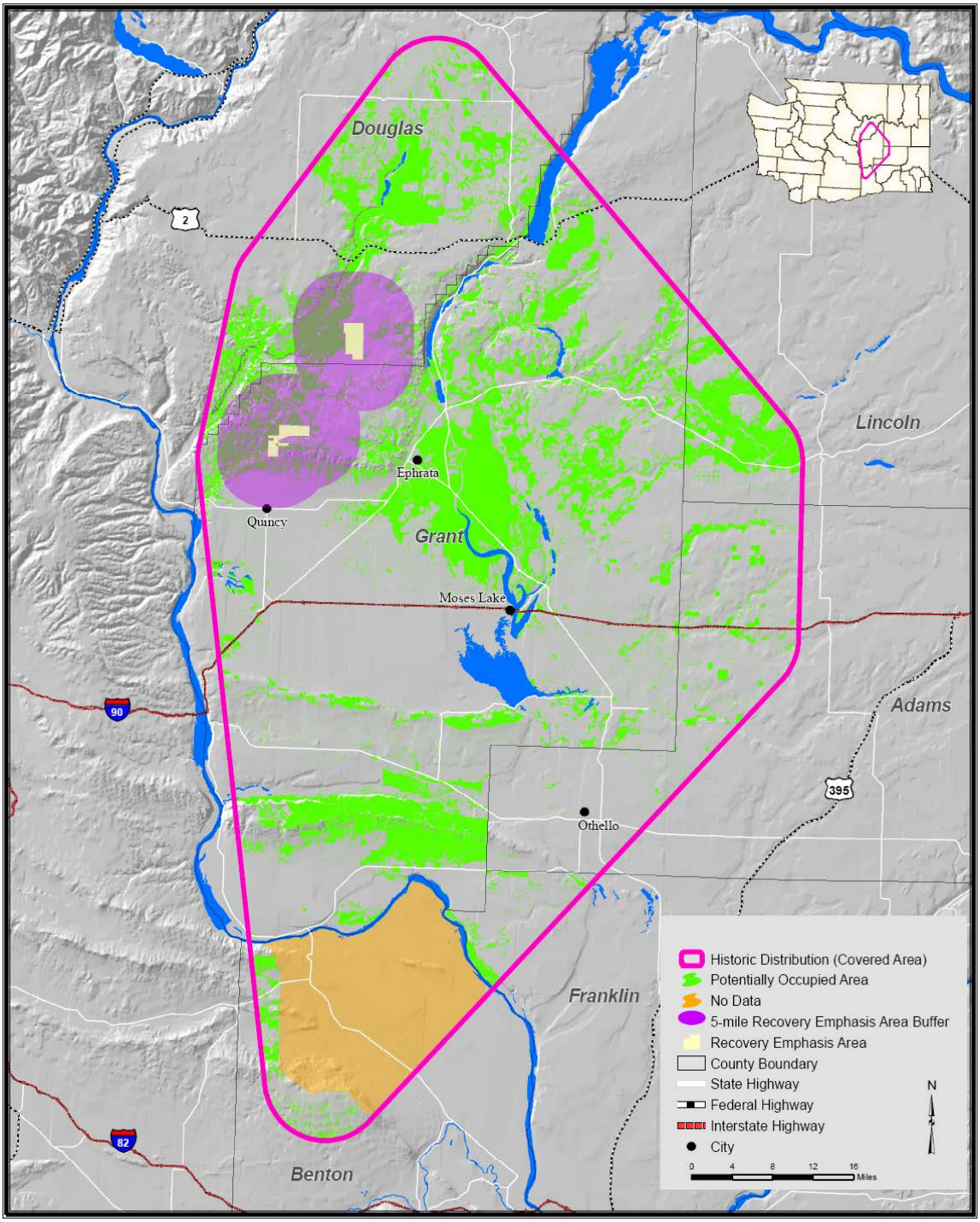


Figure D-1: Historic Ranges and Recovery Areas for Columbia Basin Pygmy Rabbit (Source: USFWS 2006)

The current distribution of the pygmy rabbit in Douglas County includes the Sagebrush Flat Wildlife Area (USFWS 2012) and is likely to expand into surrounding areas.

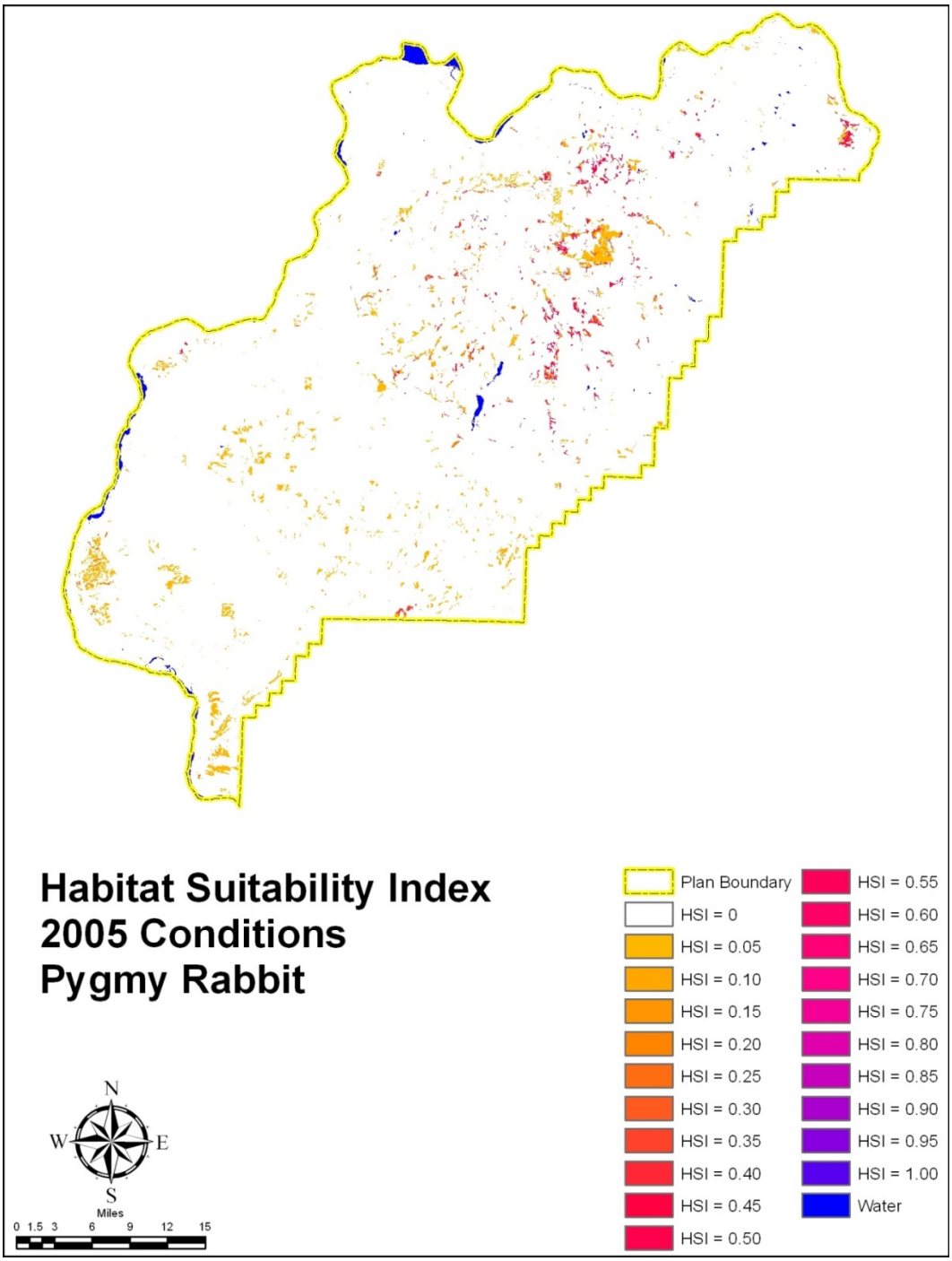


Figure D-2: Habitat Suitability Index 2005 Conditions, Columbia Basin Pygmy Rabbit

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

Status

In 1990, the Columbia Basin pygmy rabbit was listed as a threatened species by the Washington Wildlife Commission. The Commission reclassified the species as endangered in 1993. In 2001, the USFWS listed the Columbia Basin pygmy rabbit as "Endangered" by emergency rule. In 2003, the USFWS listed the Columbia Basin distinct population segment of the pygmy rabbit as "Endangered" pursuant to the ESA of 1973 (UFWS 2012).

Recovery Plans

Both the USFWS Columbia Basin pygmy rabbit recovery plan (2012) and the recovery plan developed by the WDFW (1995a) include recovery actions and strategies. Those in the WDFW recovery plan include:

1. Monitor the pygmy rabbit population.
2. Protect the pygmy rabbit population.
3. Manage habitat to increase pygmy rabbit abundance and distribution.
4. Establish populations in new areas.
5. Enforce restrictions designed to protect pygmy rabbits.
6. Establish information management and retrieval systems.
7. Coordinate and cooperate with public agencies and other landowners.
8. Complete scientific investigations that will benefit recovery efforts.
9. Develop public information and education.

WDFW recovery strategy now also includes: 1) translocating wild pygmy rabbits to Washington; 2) breeding wild rabbits in semi-wild enclosures; and 3) releasing juvenile offspring and wild-caught adult rabbits from neighboring states (Becker 2013).

Recovery actions in the USFWS recovery plan include:

1. Manage partially-controlled field-breeding for the Columbia Basin pygmy rabbit (CBPR).
2. Reestablish free-ranging CBPR subpopulations within their historical distribution.
3. Survey for, monitor, and access free-ranging CBPR.
4. Protect free-ranging CBPR
5. Manage habitats at recovery emphasis areas and intervening properties.
6. Pursue conservation agreements with landowners and managers of intervening properties within the population's historical distribution.
7. Exchange information with stakeholders and the general public to address concerns and increase support for CBPR recovery efforts.
8. Secure funding for CBPR recovery efforts.
9. Revise this Federal Recovery Plan to facilitate implementation of adaptive management measures considered necessary to achieve the phased recovery strategy.

As with the WDFW recovery strategies that were modified as new information became available, the USFWS recovery plan may be modified in the future.

Recovery Efforts

To address the steep population decline of the Columbia Basin pygmy rabbit, the WDFW developed a captive breeding program beginning in 2000. Active captive breeding began in 2002, and ultimately involved three facilities: Washington State University, Northwest Trek Wildlife Park, and the Oregon Zoo. Although as many as 275 kits were produced in 2010, the captive breeding program could not support expected reintroduction needs or adequately address some of the identified threats to the population. As a result, the captive breeding program was discontinued after the 2012 breeding season (USFWS 2012).

The first reintroduction efforts of captive-bred Columbia Basin pygmy rabbits occurred in 2007, when 20 adult pygmy rabbits were released into habitat at the Sagebrush Flat Wildlife Area. These animals suffered very high mortality rates and none survived to the spring of 2008 (USFWS 2012).

In 2011, the recovery strategy for the Columbia Basin pygmy rabbit was modified in order to increase the potential for successful population recovery. The modified strategy included: 1) translocating wild pygmy rabbits to Washington from other states; 2) breeding rabbits in semi-wild conditions on the release site; and 3) releasing juvenile offspring of mixed lineage, and adult wild-caught pygmy rabbits from neighboring states (Becker 2013).


Credit: WDFW

Beginning in the spring of 2011, rabbits from the captive-breeding facilities were moved to six and ten acre enclosures on Sagebrush Flat Wildlife Area. In 2011 and 2012, a total of 78 pygmy rabbits were translocated from Nevada, Utah, and Oregon and placed in the enclosures, where they joined captive-bred adults and kits. As of 30 June 2013, more than 200 pygmy rabbit kits have been released into the wild. Winter surveys during December 2012 and January 2013 on more than 2,400 acres on or near the Sagebrush Flat Wildlife Area located approximately 110 active burrows (Becker 2013).

Factors Affecting Continued Existence

In the development of their respective recovery plans, both the WDFW and USFWS identified factors and threats to the continued existence of the Columbia Basin pygmy rabbit population in Washington. The WDFW recovery plan (1995) lists five factors that may affect the continued existence of the pygmy rabbit:

Present and Threatened Habitat Loss

Habitat loss, primarily through conversion of shrub-steppe habitat to agricultural purposes, has been the single most important factor in the decline of Columbia Basin pygmy rabbit populations in Washington. Additional shrub-steppe habitat has been lost through excessive grazing, more frequent wildfires, and land conversion to housing and industrial development. Continued habitat loss would pose a threat to the recovery of pygmy rabbit populations in Washington.

Low Population

Low population makes the species vulnerable to extirpation due to a single natural catastrophe, such as wildfires, reduced food production, floods, disease outbreak, predation, parasite infestations, severe adverse weather, low reproductive success, and inbreeding. All of these factors occur from time to time; however, low populations are at risk of extirpation particularly when two or more factors occur over a short time period.

Habitat Linkages

Habitat corridors and habitat connectively are very important to recover and maintain viable populations of pygmy rabbits. The maintenance of viable long-term populations, without human assistance, will require the establishment of habitat corridors linking several individual small populations.

Fire

The prevention of wildfires in existing or potential pygmy rabbit habitat is crucial to the recovery of this species. Wildfire can devastate shrub-steppe habitat upon which pygmy rabbits depend. It may take decades for big sagebrush and other shrubs to become reestablished after a severe fire.

Interspecific Relationships

Due to the current small population size of Columbia Basin pygmy rabbits at Sagebrush Flat Wildlife Area, both predation and parasites pose a threat to the future existence of this species. Predators of pygmy rabbits include coyote (*Canis latrans*), badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), great-horned owl (*Bubo virginianus*), short-

eared owl (*Asio flammeus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), and golden eagle (*Aquila chrysaetos*)

In addition, pygmy rabbits are known to host a variety of external and internal parasites, including fleas, ticks, lice and bot fly larvae.

The USFWS Columbia Basin pygmy rabbit recovery plan (2012) also identified five threats to the continued existence of the pygmy rabbit population in Washington, including:

Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Ranges

The conversion of shrub-steppe habitat in Eastern Washington to other uses since Euro-American settlement has already been discussed. Nearly 60 percent of the original shrub-steppe habitat within the Columbia Basin has been converted to other uses. Much of the remaining shrub-steppe habitat has been degraded and/or fragmented. Continued shrub-steppe habitat loss would pose a threat to the long-term recovery of the species in the state.

Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Columbia Basin pygmy rabbits are difficult to distinguish from cottontail rabbits (*Sylvilagus spp.*). In areas where pygmy rabbits and cottontails may both be present, pygmy rabbits may be vulnerable to harvest during legal hunting seasons. Recovery efforts that require trapping, handling, translocation, and/or captivity of pygmy rabbits can result in mortality from several causes, including capture stress, intra-specific fighting, entanglement in traps, and trap predation. As of 31 December 2011, the annual mortality due to captive breeding is estimated at approximately 2 percent, which is within acceptable limits. Field research activities may cause the collapse of shallow burrows, or cause secondary disturbances to portions of the population.

Disease and Predation

Columbia Basin pygmy rabbits can harbor a high parasite load; ticks, fleas, and lice can be disease vectors. Other rabbit species have suffered episodes of plague and tularemia from these vectors. No severe disease epidemics have been reported in pygmy rabbits, and parasites have not been a significant threat to the species.

However, several captive Columbia Basin pygmy rabbits have died as a result of various diseases, especially coccidiosis and mycobacteriosis. A protozoan (*Eimeria spp.*) causes coccidiosis and can be found in feces and in the soil. The bacterium that causes mycobacteriosis (*Mycobacteium avium*) is found in soil and water and can survive for long time periods. The bacterium can be shed in high numbers in feces and urine.

Predation may be a major cause of mortality of pygmy rabbits. Predation is not likely to represent a serious threat to the continued existence of a large, well-distributed

population. However, altered, or even natural predation levels, may pose a significant threat to the recovery of pygmy rabbits in Washington, due to the small population size and localized distribution of the Columbia Basin pygmy rabbit. Several species of birds and mammals prey on pygmy rabbits, including coyote (*Canis latrans*), badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), great-horned owl (*Bubo virginianus*), short-eared owl (*Asio flammeus*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), and golden eagle (*Aquila chrysaetos*)

The Inadequacy of Existing Regulatory Mechanisms

Although the listing of the Columbia Basin pygmy rabbit as "Endangered" by WDFW makes it illegal to hunt, possess, maliciously harass or kill pygmy rabbits, or maliciously destroy their nests, there is inadequate regulatory protection for existing or future shrub-steppe habitat upon which this species depends. Those lands managed by WDNR and WDFW are subject to the prescribed standards of H.B. 1309, but these standards do not specifically address protection and conservation of the Columbia Basin pygmy rabbit. Much of the existing or potential shrub-steppe habitat within the historical range of this species is in private ownership. Large areas of privately-owned lands have been withdrawn from crop production and planted to native and non-native vegetation under the Federal Conservation Reserve Program (CRP/SAFE). Under CRP/SAFE, revegetation standards promote improvement of habitats potentially used by the Columbia Basin pygmy rabbit, but these standards do not specifically address protection and conservation of the Columbia Basin pygmy rabbit.

Other Natural or Human-caused Factors Affecting Its Continued Existence

The extremely low population size and very limited geographic distribution of the Columbia Basin pygmy rabbit makes it highly susceptible to random environmental events, including the following:

1. Sudden changes in food availability or habitat due to wildlife or insect infestations.
2. Random weather events such as severe storms, prolonged drought, and extreme cold spells.
3. Inbreeding.
4. Altered predation or parasite populations.
5. Disease outbreaks.
6. Low reproductive success.
7. Wildfires.

The potential reestablishment of the Columbia Basin pygmy rabbit and its long-term security in the wild are at significant risk due to these influences.

Washington Ground Squirrel (*Spermophilus washingtoni)*
Status: Federal Candidate, State Candidate

The Washington ground squirrel (WSG) is a burrowing species that lives in sagebrush or grassland habitats in the Columbia River Basin of Washington and Oregon (Klein 2005).

Physical Description

The Washington Ground Squirrel is overall grey in color with light speckling on the back and buffy underparts. Total length ranges from about 7 inches to 10 inches, while weight ranges from about 5 to 10 ounces (Eder 2002). The tail is short (32 to 65 mm); the rounded eyes are set high on the head; the postorbital processes are well developed; and the zygomatic arches expand posteriorly. The cheek teeth are high crowned. Grayish-white spots about 4 mm across mark the smoky-grey base color on their backs. The underside is grayish-white and extends up the sides of the body to a line connecting the shoulder and thighs. There is a white eye-ring.

Weight varies seasonally between 120 and 300 grams. Males are slightly larger than females, with total body lengths of males and females ranging from 185 to 245 mm. *Spermophilus washingtoni* can be distinguished from other grounds squirrels (*S. columbianus* and *S. beldingi*) in the same area because they are smaller, with smaller ears and a spotted pelage, which the other two species lack. *Spermophilus washingtoni* have a hind foot of less than 43 mm; the other two species have longer hind foot lengths (Tomich 1982; Richart and Yensen 1992; Verts and Carraway 1998).

Life History

Washington ground squirrels spend less than half the year in an active period, normally between late winter and early summer. During this period, all feeding, reproduction, and social activities occur. The active period coincides with the availability of high quality forbs and grasses essential for reproduction and building fat reserves for the following hibernation period. By mid-summer, all Washington ground squirrels have entered hibernation, where they will stay until the following late-winter (Sato 2010).

Habitat Requirements

Washington ground squirrels inhabit arid, open, shrub-steppe and grassland habitats. They also occur in the sandy soils found along ravines, dry river bottoms, and hillsides (Greene et al. 2009). Colonies tend to be located in areas of deeper, weaker soil containing a low percentage of clay. Percent cover of annual grass, perennial and annual grass combined, and grass and forbs combined, is higher in occupied habitat.

Washington ground squirrels tend to choose sites where proportions of annual grass and food resources (grasses and forbs) are high (Betts 1990). Diet is succulent vegetation, flowers, roots, bulbs, seeds, and insects. A wide variety of grasses and forbs are consumed. As these dry, squirrels shift to seeds (Verts and Carraway 1998).

Distribution and Range

Distribution of Washington ground squirrels is restricted to the Columbia Plateau region of Washington in areas south and east of the Columbia River, and in northeastern Oregon between the John Day River and the Blue Mountains (ODFW 1999; Biggins and Kosoy 2001; Klein 2005). Historically, this species occupied grassland and shrub-steppe habitat across much of the Columbia Plateau region of Eastern Washington but has declined drastically over the past 150 years. Records indicate that they inhabited 10 counties, but are now absent from Spokane, Whitman, Garfield, and Columbia counties.

In Washington, this species occupies sagebrush-steppe and grassland habitat east of the Columbia River in Adams, Douglas, Franklin, Grant, Lincoln, and Walla Walla counties. Most sites occur in Adams, Grant, and Douglas counties (WDFW 2012, USFWS 2012). WDFW surveyed a total of 303 Washington ground squirrel sites from late March to early June 2004 and confirmed occupancy at 218 of 247 (88 percent) sites that were classified as occupied during surveys conducted from 2001-2003. Occupancy rates for sub-regions of Washington ground squirrel sites typically exceeded 85 percent. However, the Seep Lakes area in Grant County, the Hatton area in Adams County, and the Foster Coulee area in Douglas County each showed declines of greater than or equal to 35 percent in occupancy rates from 2001-2003 surveys to the to 2004 survey (Finger et al. 2007). As of 2012, the Washington Natural Heritage Program contained 567 verified Washington ground squirrel polygons (i.e., mapped estimate of areas containing squirrels) and 65 verified point locations in its database, any one of which could constitute an individual, small, or large colony.

Areas predominated by small Washington ground squirrel sites include Foster Coulee and Sagebrush Flat in Douglas County, and also Duffy Creek, Saddle Mountains, and Beezley Hills in other Eastern Washington Counties. The largest sites in Washington occur in the Warden, Moses Coulee (Douglas County), Lind, Soap Lake, and Seep Lakes areas (Finger et al. 2007).

Douglas County Distribution

The Washington ground squirrel may occur in areas of the southern, central, and northern parts of Douglas County (Figure D-3), including but not limited to Foster Coulee, Sagebrush Flat, Moses Coulee, Badger Mountain, and Jameson Lake (USFWS 2012; Fingers et al 2007).

Figure D-3 displays the Habitat Suitability Index for potential habitats across Douglas County. The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range. After the MSGCP is approved and implementation commences, current satellite

imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

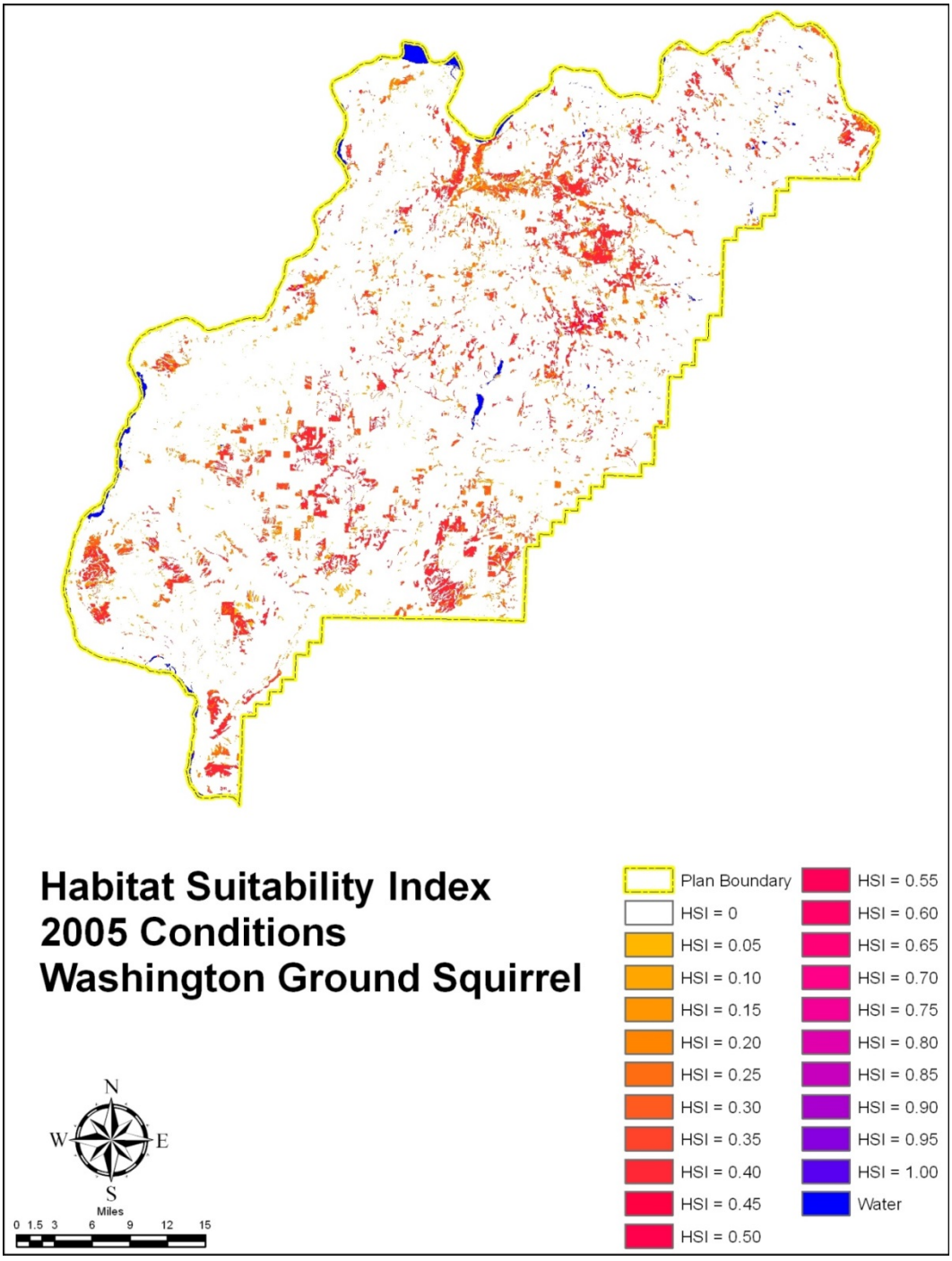


Figure D-3: Habitat Suitability Index 2005 Conditions, Washington Ground Squirrel

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

The current distribution in Douglas County includes the southeastern portion of the county, an area south of Jamison Lake, and the northeastern portion of the county (WDFW unpublished data).

In 2004, WDFW conducted field surveys of WSG sites at four locations in Douglas County—Duffy Creek, Foster Creek, Jameson Lake, and Sagebrush Flat Wildlife Area. A total of 44 active sites were recorded: Duffy Creek–21, Foster Creek–3, Jameson Lake–12, and Sagebrush Flats Wildlife Area–8. This compares with a total number of active sites recorded during field surveys in 2001-2003 at the same four locations of 48 (Finger et al. 2007).

Status

The WGS was listed as a State Candidate species in 1991 and reclassified as "Threatened" in 1998; it was designated a Federal Candidate species in 1999 (WDFW 2012).

Recovery Efforts

In an effort to increase population numbers and distribution of the Washington ground squirrel, WDFW initiated translocation of animals by live-trapping those in areas where they may have been causing a problem, such as at golf courses. Initial results were poor due to high mortality post-release. Prior to 2010, the translocation utilized "hard release" which resulted in the squirrels rapidly dispersing away from the release site. Beginning in 2010, squirrels were first released into small enclosures for a period of time prior to release. This greatly increased survival, with about 70 percent of females remaining on site after release (WDFW 2012). In 2009, WDFW released 66 females and 95 males in south-eastern Douglas County. In 2010, WDFW released 171 females and 140 males near the same location (WDFW unpublished data).

Columbian Sharp-Tailed Grouse (*Tympanuchus phasianellus columbianus*)

Status: Federal Species of Concern, State Threatened

The Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) is a medium-sized prairie grouse that historically inhabited shrub-steppe, meadow steppe, mountain steppe, and riparian deciduous habitats in Western North America, mostly west of the Rocky Mountains, from northern New Mexico to Central British Columbia (Stinson and Schroeder 2012).

Physical Description

Adult Columbian sharp-tailed grouse have a relatively short tail with the two central (deck) feathers being square-tipped and somewhat longer than their lighter, outer tail feathers giving the bird its distinctive name. The plumage is mottled dark and light browns against a white background, resulting in an over-all cryptic appearance, appropriate for a ground-nesting bird.

They are lighter on the underparts with a white belly uniformly covered in faint V-shaped markings (Stinson and Schroeder 2012).

The female is smaller than the male and can be distinguished by the regular horizontal markings across the deck feathers as opposed to the irregular markings on the male's deck feathers that run parallel to the feather shaft. Adults are 16 to 18.5 inches in length; males weight 1.5 to 2.0 pounds, while females weigh 1.3 to 1.7 pounds (Stinson and Schroeder 2012).

A pink to pale violet air sac on each side of the neck distinguishes males from females. These air sacs are inflated during courtship displays that occur on "leks" during the early spring. Adult males have a yellow comb over their eyes and a violet display patch on their neck. Females tend to have less obvious combs (Stinson and Schroeder 2012).

Life History

These birds engage in their highly-ritualized courtship in open areas or leks. Anywhere from one to 20 males will occupy one lek (average 8-12). Males stamp their feet rapidly, about 20 times per second, and rattle their tail feathers while turning in circles or dancing forward. Purple neck sacs are inflated and deflated during display. The females select the most dominant one or two males in the center of the lek, copulate, and then leave to nest and raise the young alone (Stinson and Schroeder 2012).

Habitat Requirements

Columbian sharp-tailed grouse occur in grass-dominated habitats characterized by a patchy interspersion of deciduous trees and shrubs (Zeigler 1979; Connelly et al. 1998; Kuttel and Ashley 1992; Schroeder and Tirhi 2004). In Washington, sharp-tailed grouse are associated with shrub-steppe, riparian, and mountain steppe habitats (Tirhi 1995). Vegetation height and density are more important habitat features than species composition. High quality habitat is typified by well-developed perennial bunchgrasses, forbs, and a diversity of shrub species (Hays et al. 1998). Although sharp-tailed grouse prefer to eat native vegetation, they will supplement their diet with waste grain (wheat, barley, oats) during the fall and winter (Hays et al. 1998).

In Washington, Columbian sharp-tailed grouse utilize primarily grassland habitats; escape cover is provided by near-by shrubby habitats. Grass/forb, grass/shrub, and CRP/SAFE cover-types accounted for greater than 80 percent of female locations and greater than 65 percent of male locations, while these cover types made up only 11 percent of the landscape (Schroeder and Tirhi 2004).

Winter habitat with deciduous trees and shrubs are essential because they provide cover, berries, seeds, buds, and catkins when other food is unavailable due to snow-cover. In Washington, riparian zones frequently provide critical winter habitat. Water birch (*Betula occidentalis*), rose

(*Rosa spp.*), chokecherry (*Prunus virginiana*), and big sagebrush (*Artemisia tridentate*) are important winter food and cover species (Schroeder and Tirhi 2004).

Distribution and Range

Historically, this species inhabited most of Eastern Washington, including the foothills of the Cascades, with the exception of the mountainous Northeast, Okanogan Highlands, and the Blue Mountains. While historic population estimates are difficult to develop, the population of Columbian sharp-tailed grouse in Washington may have been in excess of 100,000 birds (Stinson and Schroeder 2012).

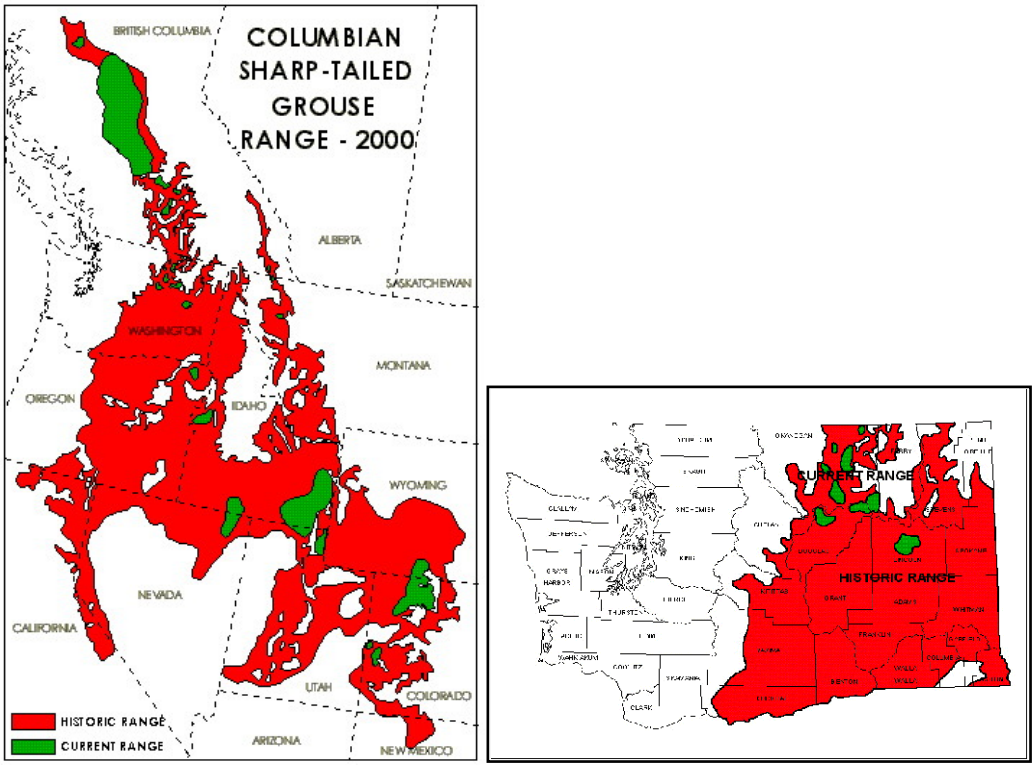
Sharp-tailed grouse populations were in serious decline soon after large-scale habitat conversion to agricultural production began in the late-1800s. This decline continued through the mid-20th century, by which time the estimated population had been reduced to 10,000 birds (Stinson and Schroeder 2012).

The sharp-tailed grouse population continued to decline and by 1970 was reduced to fewer than 4,000 birds. By the mid-1990s, the population had been reduced to approximately 1,000. The lowest population estimate was reached in 2001, at 472 birds. Since then the population has increased slowly; the estimated population in 2011 was 902 birds. Less than 3 percent of the historic range is currently utilized (Stinson and Schroeder 2012).

The current sharp-tailed grouse population is restricted to seven isolated locations in Lincoln, Okanogan, and Douglas counties. In Douglas County, they are found in the northeast corner from Bridgeport to Grand Coulee, and in the northwest corner in the Dyer area (Stinson and Schroeder 2012).

Douglas County Range

Within Douglas County, Columbian sharp-tailed grouse are likely to occur in the northern portion (Figures D-4a and D-4b). Figure D-5 displays the Habitat Suitability for potential habitats in Douglas County. The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.



Figures D-4a and D-4b: Historic and Current Range of Columbian Sharp-tailed Grouse (Source: Shroeder et al 2000; Stinson and Shroeder 2012)

Status

The Columbian sharp-tailed grouse was listed as a State "Threatened" species in 1998. It is currently designated a Species of Concern by the USFWS (WDFW 2011). The WDFW released a recovery plan, *Columbian Sharp-tailed Grouse Recovery Plan*, in 2012.

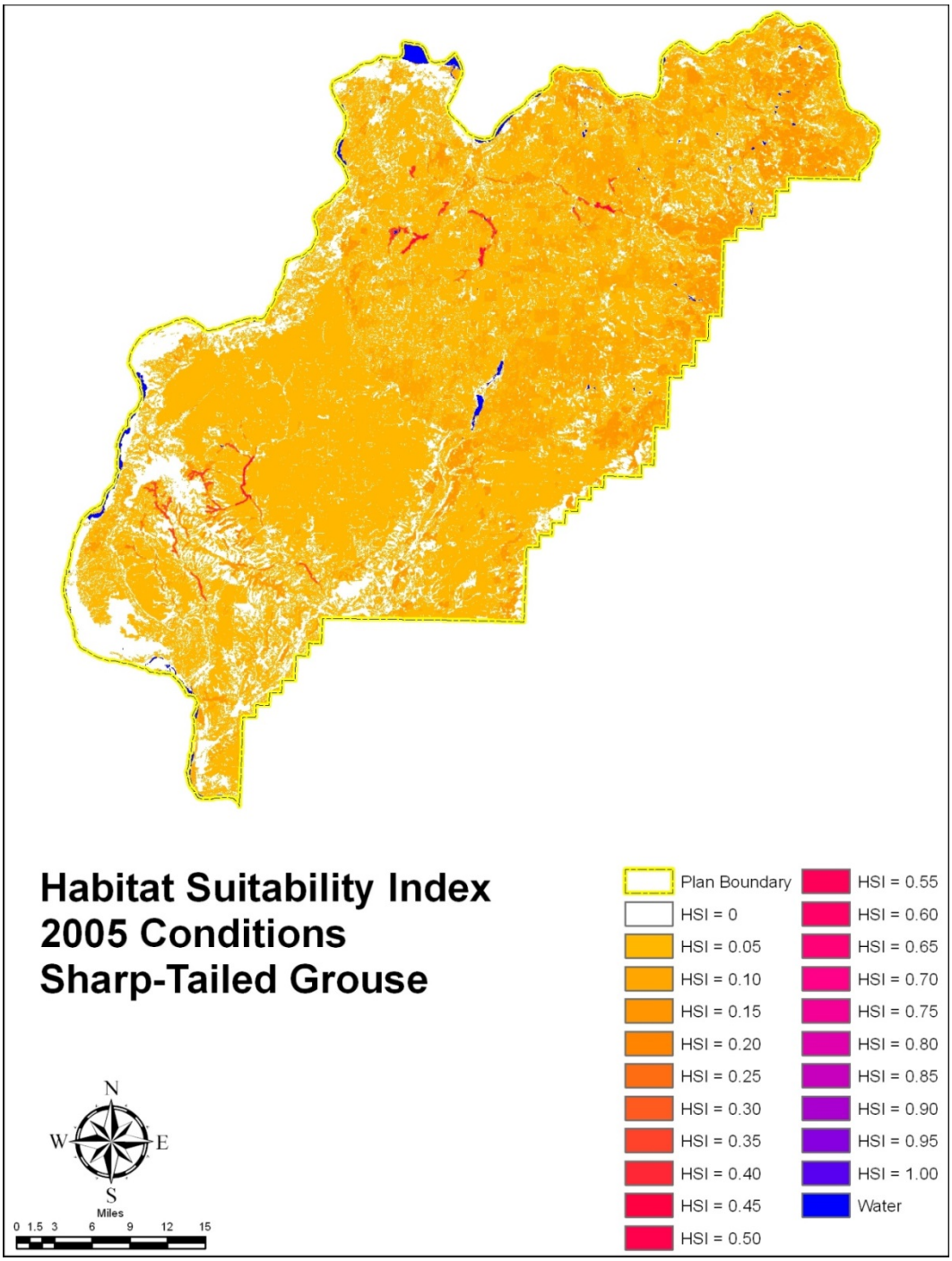


Figure D-5: Habitat Suitability Index 2005 Conditions, Columbian Sharp-tailed Grouse

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

Greater Sage-Grouse (*Centrocercus urophasianus*)
Status: Federal Candidate, State Threatened

Physical Description

The greater sage-grouse (*Centrocercus urophasianus)* is the largest species of grouse in North America. Males range from 26 to 30 inches in length and weigh 5.5 to 7 pounds. Females are smaller, measuring from 19 to 23 inches and weighing from 2.9 to 3.7 pounds. The upperparts are a combination of buff, black and brownish grey, with a black belly and long, pointed tail feathers. In addition, males have a white breast and black throat (Stinson et al. 2004).

Males also have two large yellowish-green balloon-like gular sacs, which are inflated during courtship displays. Greater sage-grouse are noted for their elaborate courtship dance, which occur in the early spring in traditional areas called "leks" (Stinson et al. 2004).

Life History

As their name implies, greater sage-grouse are closely associated with sagebrush and shrub-steppe habitat. The annual diet includes insects, forbs, grasses, and sagebrush. Insects are essential for growing chicks, while forbs are important to hens during the pre-laying period. The annual diet is 60-80 percent sagebrush, while the winter diet is almost exclusively sagebrush (WDFW 2012).

Distribution and Range

Historically, greater sage-grouse inhabited suitable shrub-steppe and meadow-steppe habitat in Eastern Washington. Their range extended from the Oregon border to the Canadian border and was bounded on the west by the foothills of the Cascade Mountains. On the south, the range ran along the Oregon border to the Blue Mountains, then north to the Spokane River, south of the Spokane River to its junction with the Columbia River, then up the Okanogan Valley into southern British Columbia (Stinson et al. 2004). Only about 8 percent of the historic range is currently occupied in the State of Washington, albeit at greatly reduced population levels (WDFW 2012). Virtually all of Douglas County was included in the historic range of the Columbia Basin Distinct Population Segment (DPS) of greater sage-grouse in Washington (Yocom 1956; Hays et al. 1998; Schroeder et al. 2000; Stinson et al. 2004; Connelly et al. 2004).

Prior to settlement of Washington by Euro-Americans, greater sage-grouse were abundant across shrub-steppe habitat, but by the late 1800s, the species was in serious decline (Stinson et al. 2004). This decline continued across the 20th century; the estimated number of sage grouse in the early 1970s was less than 3,000 birds located in three small remnant populations—Moses Coulee, Yakima Training Center, and Crab Creek. The Moses Coulee population was the largest of the three, with an estimated population of approximately 2,000 (WDFW 2012).

Unfortunately, greater sage grouse numbers have continued to decline over the past 40 years, although at a less-steep rate. The Moses Coulee population hit a 40-year low of approximately 400 in the mid-1980s, but has modestly recovered over the past 25 years (WDFW 2012). The 2011 estimated population of greater sage grouse in Washington was approximately 1,165 birds: Douglas County–926, Yakima Training Center–213, and Lincoln County–26 (WDFW 2012). The number of males in the Moses Coulee population was estimated to be approximately 350 in 2012 (USFWS 2013). Based on these estimates, greater sage-grouse in Douglas County account for approximately 80 percent of the total greater sage-grouse population in the State.

Douglas County Distribution

WDFW has designated two greater sage-grouse management units in Douglas County—Mansfield Plateau and Moses Coulee. Sage-grouse in the County probably benefit from a unique habitat mixture of habitat types comprising 52 percent shrub-steppe, 10-16 percent CRP/SAFE, and 29-37 percent cropland (Stinson et al. 2004).

Private lands in Douglas County provide nearly all the habitat occupied by the greater sage-grouse. The CRP/SAFE has benefited the sage-grouse population by removing land from crop production and establishing perennial vegetation that includes native grasses and sagebrush. Lands enrolled in CRP/SAFE provide more year-round security to wildlife than lands under cultivation. Sage-grouse probably use CRP/SAFE lands because the habitat is contiguous and provides good nesting sites. The quality of the habitat provided by CRP/SAFE lands depends on the type of vegetation planted and the length of time the land has been in CRP/SAFE (Stinson et al. 2004; Schroeder and Vander Haegen 2006).

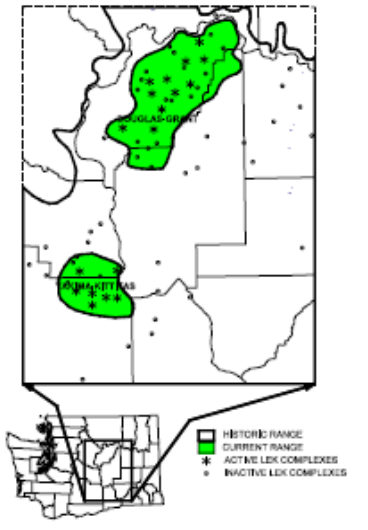


Figure 4. Distribution of active and inactive lek complexes within current and historical sage-grouse range in Washington. Inactive leks are those known to be active ≥1 year since 1960.

Figure D-6: Current and Historic Ranges in Washington, Greater Sage-grouse (Stinson et al 2004)

Within Douglas County, the greater sage-grouse is likely to occur in much of the county, as displayed in Figure D-6. The HSI map is shown in Figure D-7.

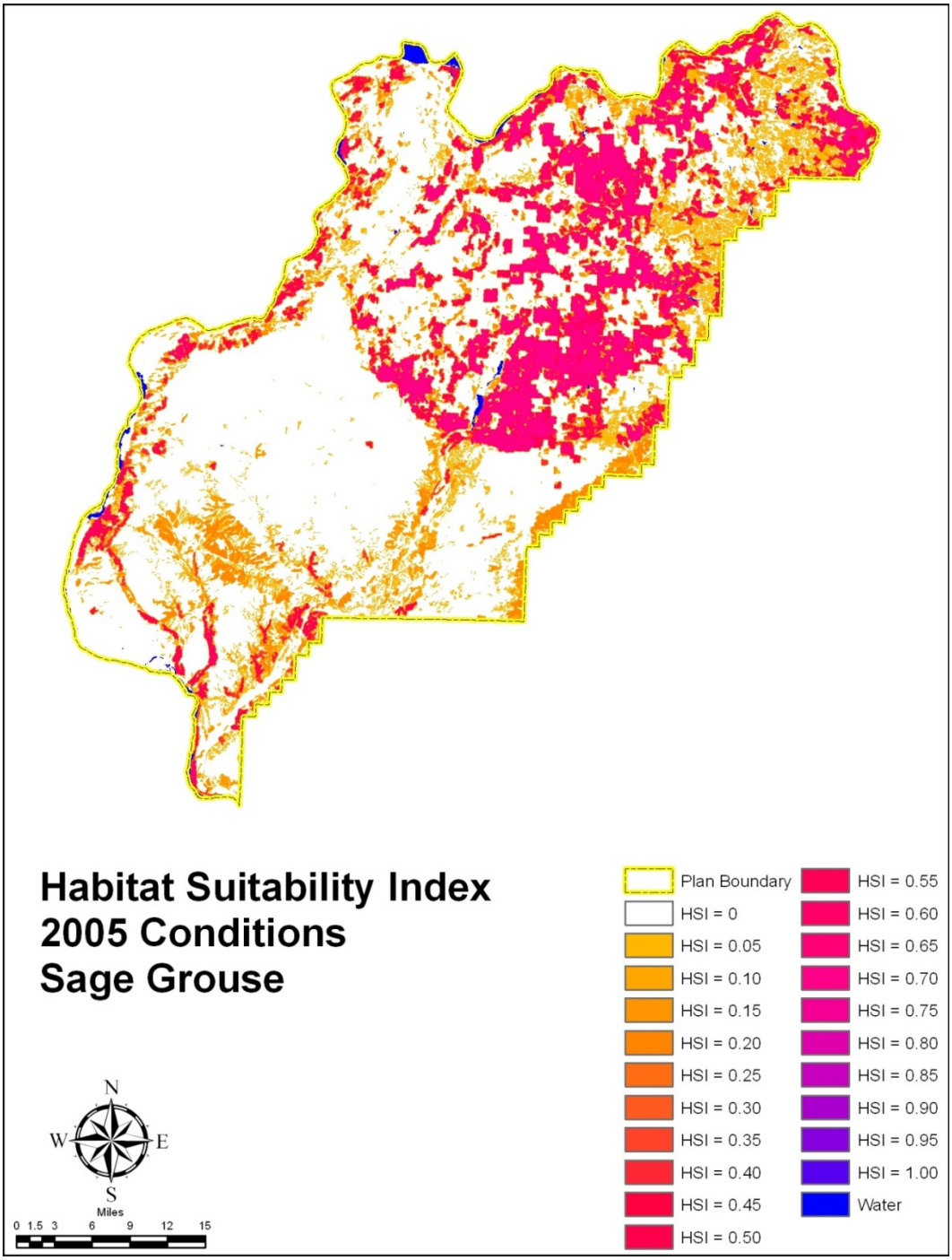


Figure D-7: Habitat Suitability Index 2005 Conditions, Greater Sage-grouse

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

Status

Greater sage grouse in Washington were listed as a State "Candidate" species in 1991; this classification was changed to State "Threatened" in 1998 (Stinson et al. 2004). The Washington Distinct Population Segment was designated a "Candidate" species by the USFW in 2001 (WDFW 2012; USFWS 2001).

Recovery Plans

The WDFW developed a recovery plan for the greater sage grouse, *Greater Sage-Grouse Recovery Plan*, in 2004. The WDFW recovery plan ((Stinson et al 2004) includes 11 Conservation Strategies to restore greater sage-grouse populations in Washington:

1. Inventory and monitor the greater sage-grouse population in Washington.
2. Protect sage-grouse populations.
3. Enhance existing populations and re-establish additional populations.
4. Protect sage-grouse habitat on public lands.
5. Work with landowners to protect the most important sage-grouse habitat on private land.
6. Facilitate and promote the use of incentives, such as Farm Bill conservation programs, to benefit sage-grouse.
7. Facilitate management of agricultural and range-lands that is compatible with the conservation of sage-grouse.
8. Restore degraded and burned sage-grouse habitat within Sage-Grouse Management Units.
9. Conduct research necessary to conserve sage-grouse populations.
10. Cooperate and coordinate with other agencies and landowners in the conservation, protection, and restoration of sage-grouse in Washington.
11. Develop public information materials and educational programs for landowners, schools, community organizations, and conservation groups as needed.

In February 2013, the U.S. Fish and Wildlife Service issued *Final Report: Greater Sage-Grouse (Centrocercus urophasianus) Conservation Objectives*. This report is designed to help States and other partners conserve the greater sage-grouse with a landscape level strategy. The report, prepared by state and Federal scientists and sage-grouse experts, identifies the conservation status of the greater sage-grouse, the nature of the threats facing the species, and objectives to ensure its long-term conservation. In this report, six General Conservation Objectives were identified:

1. Stop population declines and habitat loss.
2. Implement targeted habitat management and restoration.
3. Develop and implement state and federal sage-grouse conservation and associated incentive-based conservation actions and regulatory mechanisms.
4. Develop and implement proactive, voluntary conservation actions.

5. Develop and implement monitoring plans to track the success of state and federal conservation strategies and voluntary conservation actions.
6. Prioritize, fund, and implement research to address existing uncertainties.

The BLM has prepared a *National Sage-Grouse Habitat Conservation Strategy* (USBLM 2004) to address the conservation of greater sage-grouse habitat on BLM-managed lands.

Factors Affecting Continued Existence

The WDFW greater sage-grouse recovery plan includes variety of factors that may influence the continued existence and recovery of greater sage-grouse in Washington. They are listed here without discussion or elaboration. For more complete information about each factor, see the *Greater Sage-grouse Recovery Plan* (Stinson et al. 2004).

- Population Size and Isolation
- Fire and Sage-Grouse
- Biotic Soil Crusts and Disturbance
- Livestock Grazing
- Elk
- Wind Energy Projects
- Power lines, Fences, and Roads
- Habitat Fragmentation
- CRP/SAFE and Habitat Security on Private Lands
- Sagebrush Control
- West Nile Virus
- Predation
- Harassment and Disturbance
- Insecticides and Herbicides

The USFWS identified 14 threats to the continued existence and recovery of sage-grouse populations, 10 of which are applicable to Douglas County:

1. *Fire—Conservation Objective*: Retain and restore healthy, native sagebrush plant communities within the range of sage-grouse.
2. *Non-native, Invasive Plant Species—Conservation Objective*: Maintain and restore healthy, native sagebrush plant communities.
3. *Sagebrush Removal—Conservation Objective*: Avoid sagebrush removal or manipulation in sage-grouse breeding or wintering habitats.
4. *Grazing—Conservation Objective*: Conduct grazing management for all ungulates in a manner consistent with local ecological conditions that maintains or restores healthy sagebrush, shrub, and native perennial grass and forb communities and conserves the essential habitat components for sage-grouse (shrub cover, nesting cover).

5. *Range Management Structures—Conservation Objective*: Avoid or reduce the impact of range management structures on sage-grouse.
6. *Agricultural Conversion—Conservation Objective*: Avoid further loss of sagebrush habitat for agricultural activities (both plant and animal production) and prioritize restoration.
7. *Recreation—Conservation Objective*: In areas subjected to recreational activities, maintain healthy native sagebrush communities based on local ecological conditions and with consideration of drought conditions, and manage direct and indirect human disturbance (including noise) to avoid interruption of normal sage-grouse behavior.
8. *Ex-Urban Development—Conservation Objective*: Limit urban and exurban development in sage-grouse habitats and maintain intact native sagebrush plant communities.
9. *Infrastructure—Conservation Objectives*: Avoid development of infrastructure within Priority Areas for Conservation.
10. *Fences—Conservation Objectives*: Minimize the impact of fences on sage-grouse populations.

Douglas County Multiple Species General Conservation Plan

Appendix E: Covered Activities, BMPs, and Effects Modeling Process

Overview

As described earlier, implementation of the MSGCP includes the following steps:

1. Develop a Farm Plan using the RMS or similar process (see below, and Appendix H), and use the GCP Site Plan Checklist (Appendix B). An existing farm plan, including one developed under the Sage Grouse Initiative may be used as a starting point.
2. Determine conservation practices to implement in the Farm Plan (Appendix E). Farm Plans and conservation practices (CPs) result in improved habitats, but many species need additional site-specific measures to minimize effects.
3. As appropriate based on activities, ranges, and habitats, implement additional measures by land-use categories (Appendix E, Table E-2) and species-specific measures (Appendix E, Table E-3). To determine need for species-specific measures, review species range maps and any known location data for Covered Species (Appendix D).
4. FCCD will review the Farm Plan and GCP Site Plan to ensure consistency with the MSGCP; the USFWS may also provide technical review and assistance, then the applicant will apply for a Section 10 permit.
5. The USFWS will notice applications in the Federal Register, and request public comments during a 30-day public comment period. After consideration of public comments, and if consistency with the MSGCP and related decision documents is assured, the USFWS will issue a Section 10 permit to the Applicants.
6. Applicants/Permittees implement the plan.
7. FCCD and the Applicants/Permittees monitor, per Chapter 4 and HSI process in Appendix G.
8. BMPs, Farm Plans, GCP Site Plans, and/or Permits may be modified over time as expected in AMMP.

Appendix E outlines agricultural practices included as Covered Activities in the MSGCP. It also discusses Best Management Practices (BMPs) related to Covered Activities, as well as the Effects Modeling Process used in preparation of the MSGCP

Covered Activities

Covered Activities in the MSGCP are those used by private landowners within Douglas County in the preparation of soil for crop production, the cultivation of crops, and the production and culture of animal products and fiber for human consumption, feed, and/or sale as articles of trade or commerce. Covered Activities are organized into groups of related practices. These groups are assigned activity numbers. Activity numbers are used in Tables E-6 through E-9, where minimization and mitigation strategies for Covered Activities are shown.

Table E-1: List of Covered Activities

Activity #	Land Use	Activity Category	Covered Activity
1.1	Dryland Agriculture	Conversion	Mowing CRP/SAFE lands Burning CRP/SAFE lands Plowing CRP/SAFE lands
1.2	Dryland Agriculture	Field Preparation	Mowing stubble Burning stubble Plowing/disking/harrowing Roughing Rock pile removal Rock picking Coil packing
1.3	Dryland Agriculture	Weed/Pest control*	Sub-soiling Rod-weeding Burning
1.4	Dryland Agriculture	Infrastructure	Road management Structures (fences, etc.) Wildlife water Irrigation systems Wildlife reserves
1.5	Dryland Agriculture	Crop Management	Seed treatment Conventional seeding Direct seeding Fertilization-ground Fertilization-aerial Irrigation Harvesting Swathing Baling Hauling Storage Grazing Conservation crops (CRP/SAFE) Mowing/brush beating Burning Seeding Predator control
2.1	Rangeland	Range improvement	Mowing/brush beating Burning Seeding Predator control
2.2	Rangeland	Range Infrastructure	Road management Trail management Water development Structures (fences, etc.)

Activity #	Land Use	Activity Category	Covered Activity
2.3	Rangeland	Livestock Management	Grazing system Moving and herding Water distribution Salt distribution Wintering Confinement Calving Feeding Vaccinations Manure management
3.1	Irrigated Agriculture	Crop Maintenance	Planting preparation Tree planting Summer pruning Flail mowing Ripping Tree removal Waste burning Waste chipping Seeding cover crop Irrigation and/or frost control Fertilization Pollination Thinning Helicopter fruit drying Harvesting
3.2	Irrigated Agriculture	Weed/Pest Control*	Mowing
3.3	Irrigated Agriculture	Infrastructure	Trellis management Fence management Road management Irrigation systems Netting Wind machines Water machines

*The impact from application of pesticides (herbicides, rodenticides, etc.) is not a Covered Activity under the MSGCP, while impacts from the use of equipment, such as tractors, would be a covered activity. Current or future Section 7 consultations between the USFWS and the U.S. Environmental Protection Agency may cover those activities, and Applicants/Permittees will still voluntarily implement additional measures, such as no-spray buffers or integrated pest management, to focus pesticide use and minimize non-target impacts. Potential voluntary measures are listed on page E-11.

**Covered Activities include actions related to irrigation from ground water sources and from surface water sources on portions of creeks, tributaries, and lakes where those portions of the water bodies do not contain anadromous salmon, steelhead, or bull trout. Covered Activities do not include irrigation water obtained from the mainstem Columbia River, or water piped into Douglas County from the Wenatchee River.

Best Management Practices

The term BMPs is a general term that includes CPs, additional land-use measures, and additional species-specific measures. The following CPs will be selected as appropriate for implementation during the Farm Plan development process.

NRCS Conservation Practice Standards

NRCS Conservation Practice Standards (CPs) are nationwide standards used as the basis for Resource Management System (RMS) best management practices to address various natural resource concerns and ensure they meet design criteria. Individual states may modify the CPs by making them more restrictive than the national standard. Additionally, counties may make CPs more restrictive than the state version. At this time, all counties in Washington State prescribe to the state practice standards.

A state or county may change the practice number, name, or description in order to retain consistency across the country. This list is a subset of all available NRCS CPs and was abridged to limit it to practices typically used in Douglas County. For a complete list, please contact a local NRCS field office or follow this link: http://www.nrcs.usda.gov/technical/efotg/.

Table E-2: Conservation Practices Used in Douglas County

CP #	CP Name	CP Description
314	Brush Management	Removal, reduction, or manipulation of non-herbaceous plants
324	Deep Tillage	Performing tillage operations below the normal tillage depth to modify the physical or chemical properties of the soil
315	Herbaceous Weed Control	The chemical [*see previous table], biological, or mechanical removal or control of herbaceous weeds including invasive, noxious and prohibited plants.
326	Clearing and Snagging	Remove snags, drifts, or other obstructions from a channel or drainage way
327	Conservation Cover	Establishing and maintaining permanent vegetative cover.
328	Conservation Crop Rotation	Growing crops in a planned sequence on the same field.
329	Residue Management	Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities to only those necessary to place nutrients, condition residue, and plant crops
331	Contour Orchard and Other Fruit Areas	Planting orchards, vineyards, or small fruits so that all cultural operations are done on the contour

CP #	CP Name	CP Description
332	Contour Buffer Strips	Narrow strips of permanent, herbaceous vegetative cover established around the hill slope, and alternated down the slope with wider cropped strips that are farmed on the contour
338	Prescribed Burning	Controlled fire applied to a predetermined area
340	Cover crop	Crops including grasses, legumes and forbs established for seasonal cover and other conservation purposes.
342	Critical Area Planting	Establishing permanent vegetation on sites that have or are expected to have high erosion rates and on sites that have physical, chemical, or biological conditions that prevent the establishment of vegetation with normal practices.
370	Atmospheric Resource Quality Management	A combination of treatments to manage resources that maintain or improve atmospheric quality
378	Pond	A water impoundment made by constructing an embankment or by excavating a pit or dugout
382	Fence	A constructed barrier to animals or people
386	Field Border	A strip of permanent vegetation established at the edge or around the perimeter of a field.
390	Riparian Herbaceous Cover	Grasses, sedges, rushes, ferns, legumes and forbs tolerant of intermittent flooding or saturated soils established or managed.
391	Riparian Forest Buffer	An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.
393	Filter Strip	A strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forestland) and environmentally sensitive areas.
394	Firebreak	A permanent or temporary strip of bare or vegetated land planned to retard fire.
422	Hedgerow Planting	Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.
428	Irrigation Water Conveyance Ditch or Canal Lining	A fixed lining of impervious material installed in an existing or newly constructed irrigation field ditch or irrigation canal or lateral.
430	Irrigation Water Conveyance—Pipeline	A pipeline and appurtenances installed in an irrigation system.
431	Above-ground multi-outlet pipeline	A water distribution tubing consisting of aluminum, PVC, or polyethylene pipeline with closely spaced orifices or gates.

CP #	CP Name	CP Description
441	Irrigation System, micro-irrigation	Drip irrigation system.
442	Irrigation System, Sprinkler	Sprinkler, not to include center pivot or wheel lines.
443	Irrigation System, surface and subsurface	A system in which all necessary water-control structures have been implemented for the efficient distribution of water.
449	Irrigation Water Management	The process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner.
460	Land Clearing	Removing trees, stumps, and other vegetation to achieve a conservation objective
472	Access Control/Use Exclusion	The temporary or permanent exclusion of animals, people, or vehicles from an area.
500	Obstruction Removal	Removal and disposal of unwanted, unsightly, or hazardous buildings, structures, vegetation, landscape features, and other materials.
512	Pasture and Hayland Planting	Establishing native or introduced forage plant species.
516	Pipeline	Small pipeline having an inside diameter of 8 inches or less.
521	Pond Sealing or Lining	A manufactured hydraulic barrier consisting of a membrane liner or functionally continuous layer of compacted soil-dispersant material
528	Prescribed Grazing	Managing the harvest of vegetation with grazing and/or browsing animals.
533	Pumping Plant	A facility that delivers water including the pump, power, plumbing, etc.
550	Range Planting	Establishment of adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees.
560	Access Road	A travel-way for equipment and vehicles constructed as part of a conservation plan.
561	Heavy Use Area Protection	The stabilization of areas frequently and intensively used by people, animals, or vehicles by establishing vegetative cover, by surfacing with suitable materials, and/or by installing needed structures.
574	Spring Development	Collection of water from springs or seeps to provide water for conservation needs.
575	Animal Trails and Walkways	Established lanes or travel ways that facilitate animal movement.

CP #	CP Name	CP Description
590	Nutrient Management	Managing the amount, source, placement, form, and timing of the application of plant nutrients and soil amendments
595	Pest Management	Utilizing environmentally sensitive prevention, avoidance, monitoring, and suppression strategies to manage weeds, insects, diseases, animals, and other organisms (including invasive and non-invasive species), that directly or indirectly cause damage or annoyance.
614	Watering Facility	A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and or wildlife.
636	Water Harvesting Catchment	A facility for collecting and storing runoff from precipitation
642	Water Well	A hole drilled, dug, driven, bored, jetted, or otherwise constructed to an aquifer.
643	Restoration and Management of Rare and Declining Habitat	Restore and manage rare and declining habitats and their associated wildlife species to conserve biodiversity.
644	Wetland Wildlife Habitat Management	Retain, develop or manage wetland habitat for wildlife.
645	Upland Wildlife Habitat Management	Provide and manage upland habitats and connectivity within the landscape for wildlife.
734	Fish and Wildlife Structure	A structure designed and implemented specifically for fish or wildlife.
741	Grassed Buffer Strips	Establishing rows of narrow strips of herbaceous vegetation across cropland.

Additional Measures

In addition to the CPs listed, these measures will be applied to certain land use categories and activities.

All Agricultural Uses

Riparian Areas

1. Increase variety of native tree/shrub species and age classes within riparian areas. Develop riparian habitat with age class variety, plant species variety, and age diversity of shrub and tree canopy layers. Possible management practices:
    a. Implement rotation and deferred grazing strategies within riparian areas that produce a diversity of age, species, and life forms within riparian habitat areas, resulting in a properly functioning condition. Deferred and rotation grazing systems that provide extended periods of rest are needed to produce appropriate vegetation age classes when they are missing.
    b. Use fencing to control livestock use periods.
    c. Monitor herbicide applications.
    d. Avoid overspray of herbicides within riparian areas.
2. Manage existing riparian habitat to allow it to reach its full site potential and function.
3. Restore range riparian habitat to support Covered Species.
4. Protect springs, seeps, and wet meadows within and adjacent to sagebrush stands from over-grazing.
5. Manage lands to provide good water quality and riparian conditions in seeps, wetlands, springs, creeks, rivers, lakes.
6. Maintain snags or potential snags, including large old cottonwoods, in riparian areas.
7. Maintain riparian flood plain and associated shrub habitat.
8. Avoid cutting or removing willows or other species important for sharp-tailed grouse wintering, including water birch, hawthorn, serviceberry, chokecherry, etc.
9. Consider removing exotic white poplar (*Populus alba*) where it is crowding out water birch and other native riparian species (Stinson and Schroeder 2012, p. 53).

Wildfire Management

1. Develop fire management plans with local fire districts.
2. Manage mechanical firebreaks and backfires to minimize impacts to Covered Species and supporting habitats.
3. Along with local fire districts, identify habitats that need special consideration during wildfire control and discuss special control techniques. Identify areas where fire control is not a critical issue.
4. Use mechanical firebreaks and backfires to minimize the adverse effects of wildfire control on critical habitats.

5. Group land units into control, limited control, and minimal wildfire control areas.

Recreational Use: Non-Agricultural Motorized Vehicle Use, Hunting, Fishing, Wildlife Viewing

1. Restrict recreational use during critical mating, nesting, and brood-rearing periods, especially near sharp-tailed grouse leks (March1 to June 30) and sage grouse leks (February 1 to June 30).
2. Ensure proper use of gates and other livestock management devices.
3. Minimize motorized access.
4. Consider potential impacts on wildlife, site habitat features, ranch operations and quality of life before permitting hunting and recreation. Educate visitors about limits, rules, and cautions needed to make sure their land use has minimum impact on habitat, wildlife resources, forage production, and ranch operation.
5. Minimize visitor vehicle traffic on ranch roads to prevent noxious weed introduction.
6. Develop educational information about Covered Species that Applicants/Permittees can share with hunters.
7. Washington ground squirrels are a protected species under state law and should not be subjected to recreational shooting by the landowner or the public. In situations where the landowner believes that the squirrels pose a threat to crops, the landowner should contact USFWS and/or WDFW to discuss non-lethal options for resolving the problem.

Maintain Remnants

1. Maintain, enhance, and protect from degradation remnant patches of shrub-steppe interspersed in CRP/SAFE and cropland. Rock piles that do not support shrub-steppe vegetation are not considered remnants.

Pest Management and Weed Management

1. Integrate pest management techniques. Design control methods to target pest species only.
2. Implement integrated weed management plans to ensure timely elimination of invasive plants to prevent their spread to adjacent habitats.
3. Encourage biological control of weeds.

<u>*Dryland Agriculture*</u>

Conversion of Conservation Cover to Active Farming

1. If CRP/SAFE or other conservation contracts cannot be maintained due to program changes, enroll these conservation lands into other Federal Farm Bill conservation program such as Grassland Reserve Program (GRP), Agriculture Conservation Easement Program (ACEP), or other similar Federal, State, or other similar programs if available.

2. Maintain original remnant patches of shrub-steppe within CRP/SAFE fields when converting back to crops.
3. To minimize the disturbance to Covered Species using CRP/SAFE, ensure that conversion does not occur within species-specific timing restrictions in Table E-3.

Erosion

1. Farm plans/GCP Site Plans will include erosion control measures to reduce sheet, rill and gully erosion at field edges by trapping sediment and reducing surface runoff.

Rangeland Agriculture

Grazing Guidelines

Note: The standard grazing guidelines and species- specific measures below provide prescriptions with the goal of producing or maintaining habitat for covered species' life history needs, including providing for cover, forage, and reproduction habitat. Other alternative grazing rotations or prescriptions might be acceptable, as long as they met similar expectations, including utilization rates, stubble heights, and distribution and timing that encourages plant productivity and vigor, seed production, photosynthesis, recovery and re-growth. Alternative grazing prescriptions may need more stringent monitoring plans that are developed and implemented to ensure that expectations are being met. If expectations are not met, the grazing prescriptions may need to be modified as implementation proceeds.

The following will promote better habitat and encourage plant productivity and vigor, seed production, photosynthesis, recovery and re-growth.

1. Develop a grazing management plan that accounts for the intensity of grazing and the timing of both grazing periods and recovery periods. The plan should include:
2. Graze a pasture no more than once every third year during the critical period for key bunchgrass species (boot stage through seed formation: typically May 15 to July15).
3. Manage utilization to achieve:
    a. No more than 50 percent utilization during the growing season
    b. No more than 60 percent utilization during the dormant season.
4. Maintain a minimum stubble height of 5" at all times on desirable bunchgrasses on average in a pasture. Note that a stubble height of 8" is better than 5" in appropriate growing sites.
5. Manage livestock distribution to minimize overgrazing, especially during drought. Tools such as fencing, the placement of water & salt, and riding can be used.
6. During winter, use one smaller sacrifice area for feeding to minimize impacts to shrub-steppe and other habitats.

7. Utilization of woody species will not exceed 50 percent of annual leaf and twig growth within reach of animals, unless a grazing system is implemented which has a high rest to grazing period ratio which allows for adequate recovery following heavier use.

Riparian Use

1. Allow early spring grazing only in existing riparian pasture and manage access.
2. Exclude use in undisturbed riparian areas.
3. Manage livestock to limit access on riparian areas by controlling length of grazing period and time of year or by utilizing exclusionary practices.
4. Use off-stream watering sites or selective herd management to promote livestock use of uplands.
5. Utilization of woody species will not exceed 50 percent of annual leaf and twig growth within reach of animals, unless a grazing system is implemented which has a high rest to grazing period ratio which allows for adequate recovery following heavier use.

Watering Sites, Supplement Sites, Livestock Concentrations

1. Locate watering facilities away from riparian zones as much as is practicable; ensure escape devices for small wildlife (such as a boards or ramps).
2. Ensure that any livestock watering diversions do not restrict fish passage nor impede water volume flow.
3. If riparian crossing location is the only option, harden crossing and manage access.
4. Locate salt licks away from riparian or wetland areas.
5. Avoid livestock concentrations or travel routes on sensitive areas.
6. Protect sensitive areas, such as riparian habitat, occupied Columbia Basin pygmy rabbit habitat, Washington ground squirrel colonies, greater sage-grouse/Columbian sharp-tail grouse leks, and rare plant populations from unnecessary impacts caused by livestock concentrations. Possible management practices include:
    a. Locating mineral supplements, water troughs and supplemental feeding sites on shallow, gravelly, or rocky soils or rocky areas away from sensitive areas,
    b. Implementing exclusion fencing.
7. Manage livestock to maintain water quality goals by minimizing concentrated animal use near streams or in upland areas where surface water drains across these sites and carries excess nutrients downslope to surface water.
8. To minimize fertilizer loss to ground water or surface flow, use fertilizers in hay fields at an agronomic level that provides plant benefit but is not in excess of plant needs.
9. Maintain chemical use on livestock and rangelands at a level that is effective, but not in amounts or in areas that would cause contamination of soil, forage, water, wildlife or habitat.

Irrigated Agriculture

Adjacent Habitat

1. Maintain adjacent non-farmed lands in natural habitats to benefit of Covered Species.

Lead Soils

1. Where lead is present in orchard soils due to past chemical applications, cover, tarp, or otherwise make soil inaccessible to wildlife when ~~and~~ significant ground disturbing activities occur (irrigation work, planting, etc.).

Food Attractant

1. Within orchard or other irrigated crops, minimize the attractiveness of the food source to wildlife. As appropriate, use deterrent measures such as reflective materials, noise generators, and barrier netting.

Voluntary Measures for Chemical Use

While pesticide and herbicide chemical use is not a Covered Activity, Permittees may wish to voluntarily implement measures such as the following to minimize non-target impacts:

1. Follow label directions.
2. Utilize Integrated Pest Management practices that consider the range of treatment options (e.g., herbicide, biological agents, mechanical, hand pulling, grazing practices) to meet requirements of State Noxious Weed Law.
3. When necessary, apply chemicals in ways that minimize impacts to Covered Species, including avoiding applications in key species locations and avoiding impacts to water systems.
4. If pastures or fields are to be fertilized, apply as far away as possible from riparian areas.
5. Utilize soil sampling to ensure agronomic rate of fertilizer is being applied.
6. Herbicide application is restricted near riparian and wetland areas or degraded areas that would allow excessive surface water transport into water bodies.
7. Where Covered Species occur, implement spot treatment with herbicide on no more than 10 percent of pasturelands per year.
8. Avoid broadcast treatment of entire pasture.
9. Isolate rodenticides so that Washington grounds squirrels or other Covered Species do not have access.
10. Do not use poison grain for rodent control.
11. Avoid spraying herbicides in riparian areas. If spraying is needed to control exotics, do so outside the covered species use season on a staggered rotation of small patches.
12. Avoid aerial application of herbicides on fields where habitat fragments are situated within the field unless assurance against overspray can be documented.
13. Avoid herbicide overspray of large shrub islands within and adjacent to cultivated fields.

14. Minimize spraying of herbicides on CRP/SAFE lands during the important spring nesting season.
15. Apply chemical sprays only under desirable wind conditions to minimize potential drift, per label directions.

Additional Measures Related to Covered Species

Table E-3 lists additional measures needed for Covered Species. During development of GCP Site Plans, FCCD and USFWS will determine which of the four covered species should be addressed with the measures below. These determinations will be based on occupancy, habitats types present, soil depths, and location in the County. For example, currently sharp-tailed grouse is more likely in the northern portion of the County.

Table E-3: Species Specific Measures

Covered Species	**If This Situation**	**Then Apply This Species Measure**
Columbia Basin Pygmy Rabbit (pygmy rabbit)	Not Already Covered by the SHA	• Provide USFWS and WDFW access to enrolled properties through a mutually-agreeable notification process to survey for and monitor any pygmy rabbits present. • Notify USFWS at least 30 days prior to undertaking any habitat-altering activity (such as conversion of CRP or SAFE lands) that could result in authorized incidental take of pygmy rabbits. Provide the USFWS and WDFW the opportunity to translocate any affected pygmy rabbits to suitable alternate site(s) prior to implementation of those activities. • Immediately notify USFWS upon finding any dead or injured pygmy rabbits on enrolled property, or immediately contact an appropriate representative of USFWS or WDFW for assistance if identification of the specimen is uncertain.
Columbia Basin Pygmy Rabbit and Washington Ground Squirrel	Known Occupied Habitat	• Avoid constructing new structures that serve as perches or nest sites for avian predators (e.g., windmills). • Survey fence lines to locate active burrows. Limit clearing of fence line to 8’ width by hand or mower. No mowing or brush removal within 30’ of a burrow. • No in-ground posts (metal or wood) within 30’ of a burrow. Use rock jacks or figure 4 braces within 30’ of a burrow and no posts of any kind within 10’ of burrow. Limit activities to late summer and fall (avoid breeding, rearing period, and winter high stress period). • Utilize Integrated Pest Management practices that consider the range of treatment options (including: biological agents, mechanical, hand pulling, grazing practices).

Covered Species	If This Situation	Then Apply This Species Measure
Washington Ground Squirrel	Known Occupied Habitat	• Avoid grazing during Washington ground squirrel active season (typically from April 1 until June 30 when Washington ground squirrels enter their extended period of dormancy, or when documented to enter summer dormancy). • Notify USFWS at least 30 days prior to undertaking any habitat-altering activity (such as conversion of CRP or SAFE lands) that could result in authorized incidental take of Washington Ground Squirrels. Provide the USFWS and WDFW the opportunity to translocate any affected Washington Ground Squirrels to suitable alternate site(s) prior to implementation of those activities. USFWS or WDFW staff are unlikely to undertake unplanned translocations of ground squirrels unless a significant population of squirrels is present on the conversion site or the species becomes federally listed. • Immediately notify USFWS upon finding any dead or injured Washington Ground Squirrels on enrolled property, or immediately contact an appropriate representative of USFWS or WDFW for assistance if identification of the specimen is uncertain. • Avoid cultivating lands that contain active ground squirrel colonies. If habitat conversion activities or CRP/SAFE takeout must be done, avoid January 21 to June 30. • Washington ground squirrels are a protected species under state law and should not be subjected to recreational shooting or poisoning by the landowner or the public. In situations where the landowner believes that the squirrels pose a threat to crops, the landowner should contact USFWS and/or WDFW to discuss non-lethal options for resolving the problem.
Columbian Sharp-tailed Grouse	Areas with Leks or Adjacent to Leks or within Likely Occupied Habitat	• CRP/SAFE takeout or other conversion activities shall not occur April 1 to July31
Columbian Sharp-tailed Grouse	Likely occupied Nesting Habitats with Grazing	• Where appropriate retain a residual cover of perennial grasses and forbs of at least 20 cm (8 in) for cover during the nesting season (April 1 through June 30).

Covered Species	If This Situation	Then Apply This Species Measure
Columbian Sharp-tailed Grouse and Greater Sage-grouse		• Immediately notify USFWS upon finding any dead or injured sharp-tailed grouse or sage grouse on enrolled property, or immediately contact an appropriate representative of USFWS or WDFW for assistance if identification of the specimen is uncertain.
Columbian Sharp-tailed Grouse and Greater Sage-grouse	Activities in or Near Leks	• Minimize impacts to Greater sage-grouse and Columbian sharp-tail grouse leks and nesting habitats during the spring breeding season and nesting season (may vary by site but typically March through June for sharp-tailed grouse; and February 20 through June for sage grouse). • Avoid disturbance to occupied leks. Typical season is between March through June for sharp-tailed grouse, and February 20 through May 15 for sage grouse. Within 0.5 mile of known leks, schedule essential springtime agricultural activities to occur in the middle of the day (avoid activities from one hour before sunset to 3 hours after sunrise). At those times and locations, avoid physical, mechanical, and loud noise disturbances. • Plan and design placement of new fences away from occupied and historic leks. If this is not possible, adequately mark fences to increase visibility. Identify existing fences that are nearby to an occupied or historic lek and consider removing or relocating the fence to a site further from the lek. At a minimum, mark all existing fences within ¼ mile from an occupied or historic lek, or in high risk areas where collisions are likely or known to occur. Use NRCS, SGI, or other appropriate national or local fence collision tools to prioritize fence marking.
Greater Sage-grouse	Areas with Leks or Adjacent to Leks or in Likely Occupied Habitats	• CRP/SAFE takeout or other conversion activities not to occur between March 15 and July 14.
Greater Sage-Grouse	Likely occupied Nesting Habitats with Grazing	• In grazed pastures, implement measures to promote nesting cover (through appropriate rotations, stocking rates, rest, and/or deferment schedules).

Effects Modeling Process

Early in the development of the MSGCP, the planning team met and discussed the impacts of Covered Activities on the fish and wildlife species of concern in Douglas County. A review matrix was established identifying the relative non-numerical severity or impacts of various activities on each of the MSGCP Covered Species as shown under the Impact Description in Table E-4. As the project evolved toward rating the County landscape into Habitat Suitability Index (HSI) units for individual species, the planning team and project consultants agreed upon an HSI-Acre numerical rating for each of the impact descriptions.

Table E-4: Impact Description Key

Key	Maximum HSI-Acres[1]	Impact Description
A	-0.7	Potential exists for direct mortality of breeding-age animals as well as young and or eggs or destruction of nests or burrows. Loss of habitat due to "permanent" conversion and a direct decline in overall habitat quality.
B	-0.6	Loss of habitat due to "permanent" conversion. Potential exists for direct mortality of breeding-age animals as well as young and or eggs or destruction of nest or burrows.
C	-0.55	Potential exists for direct mortality of breeding-age animals as well as young and or eggs or destruction of nests or burrows. Loss of habitat due to both a direct and indirect decline in overall habitat quality.
D	-0.5	Potential exists for direct mortality of breeding-age animals as well as young and or eggs or destruction of nests or burrows. Loss of habitat due to a direct decline in overall habitat quality.
E	-0.4	Potential exists for direct mortality of breeding-age animals as well as young and or eggs or destruction of nests or burrows.
F	-0.35	Loss of habitat due to "permanent" conversion and direct decline in overall habitat quality.
G	-0.2	Decline in overall habitat quality may be both direct and indirect,
I	-0.1	Decline in overall habitat quality may be indirect.
P	+0.3	Potential for positive benefits to habitat quality.

[1]Applicable impact descriptions and HSI values prepared by TAC and PLC.

Then, working with the NRCS Washington State Biologist, a set of HSI-Acre values were developed for each of the NRCS CP Standards (NRCS 2008). These values are the HSI-Acre expression that will accrue (positive or negative) as a result of implementing the CP for a given Covered Activity as shown in Table E-3. These CP Standards expressed in positive or negative HSI-Acre values reflect an average beneficial improvement or degradation value for 1) food,

2) cover or shelter, 3) quantity and quality of drinking water, and 4) health (see Table E-6 for more detail).

Further details on development of the HSI-Acre values for CP Standards are on file at the Foster Creek Conservation District. Table E-5 describes the CPs that may be implemented to minimize impacts within Covered Activities as expressed in HSI-Acres. Tables E-6 through E-9 describe the impacts of Covered Activities and the opportunity to minimize these impacts through CPs for each of the MSGCP Covered Species.

The quantifications of impacts and benefits in the following tables allow the FCCD to model changes in habitat quality over time using the HSI model.

Table E-5: Conservation Practices to Mitigate/Minimize Potential Impacts of Covered Activities

CP #	**Title and Description** **NRCS Conservation Practice Standards[1]**	**CP HSI Change[2]**
314	*Brush Management*: Removal, reduction, or manipulation of non-herbaceous plants.	-0.050
324	*Deep Tillage*: Performing tillage operations below the normal tillage depth to modify the physical or chemical properties of a soil.	0.000
326	*Clearing and Snagging*: Remove snags, drifts, or other obstructions from a channel or drainage way.	-0.040
327	*Conservation Cover*: Establishing and maintaining permanent vegetative cover	0.034
329	*Residue Management*: Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities to only those necessary to place nutrients, condition residue, and plant crops	0.010
331	*Contour Orchard and other Fruit Areas*: Planting orchards, vineyards, or small fruits so that all cultural operations are done on the contour	0.000
332	*Contour Buffer Strips*: Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips that are farmed on the contour	0.028
338	*Prescribed Burning*: Controlled fire applied to a predetermined area	0.010
342	*Critical Area Planting*: Establishing permanent vegetation on sites that have or are expected to have high erosion rates and on sites that have physical, chemical, or biological conditions that prevent the establishment of vegetation with normal practices	0.020
370	*Atmospheric Resource Quality Management*: A combination of treatments to manage resources that maintain or improve atmospheric quality	0.000

CP #	Title and Description NRCS Conservation Practice Standards[1]	CP HSI Change[2]
378	*Pond*: A water impoundment made by constructing an embankment or by excavating a pit or dugout	0.010
382	*Fence*: A constructed barrier to animals or people	0.010
386	*Field Border*: A strip of permanent vegetation established at the edge or around the perimeter of a field	0.035
391	*Riparian Forest Buffer*: An area predominantly trees and/or shrubs located adjacent to and up gradient from watercourses or water bodies	0.010
393	*Filter Strip*: A strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forestland) and environmentally sensitive areas	0.050
394	*Firebreak*: A permanent or temporary strip of bare or vegetated land planned to retard fire	0.010
422	*Hedgerow Planting*: Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose	0.020
428	*Irrigation Water Conveyance Ditch or Canal Lining*: A fixed lining of impervious material installed in an existing or newly constructed irrigation field ditch or irrigation canal or lateral	0.010
430	*Irrigation Water Conveyance - Pipeline*: A pipeline and appurtenances installed in an irrigation system	0.010
449	*Irrigation Water Management*: The process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner	0.050
460	*Land Clearing*: Removing trees, stumps, and other vegetation to achieve a conservation objective	-0.090
472	*Use Exclusion*: The temporary or permanent exclusion of animals, people, or vehicles from an area	0.060
500	*Obstruction Removal*: Removal and disposal of unwanted, unsightly, or hazardous buildings, structures, vegetation, landscape features, and other materials	0.032
521	*Pond Sealing or Lining*: A manufactured hydraulic barrier consisting of a functionally continuous layer of synthetic or partially synthetic, flexible material	0.000
528	*Prescribed Grazing*: Managing the harvest of vegetation with grazing and/or browsing animals	0.027
550	*Range Planting*: Establishment of adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees	0.054

CP #	Title and Description NRCS Conservation Practice Standards[1]	CP HSI Change[2]
560	*Access Road*: A travel-way for equipment and vehicles constructed as part of a conservation plan	0.000
561	*Heavy Use Area Protection*: The stabilization of areas frequently and intensively used by people, animals, or vehicles by establishing vegetative cover, by surfacing with suitable materials, and/or by installing needed structures	0.020
574	*Spring Development*: Collection of water from springs or seeps to provide water for a conservation need	0.022
575	*Animal Trails and Walkways*: Established lanes or travel ways that facilitate animal movement	0.000
590	*Nutrient Management*: Managing the amount, source, placement, form, and timing of the application of plant nutrients and soil amendments	0.037
595	*Pest Management*: Utilizing environmentally sensitive prevention, avoidance, monitoring, and suppression strategies to manage weeds, insects, diseases, animals, and other organisms (including invasive and non-invasive species) that directly or indirectly cause damage or annoyance	0.060
614	*Watering Facility*: A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and or wildlife.	0.013
636	*Water Harvesting Catchment*: A facility for collecting and storing runoff from precipitation	0.018
642	*Water Well*: A hole drilled, dug, driven, bored, jetted, or otherwise constructed to an aquifer.	0.000
645	*Upland Wildlife Habitat Management*: Provide and manage upland habitats and connectivity within the landscape for wildlife	0.060
741	*Grassed Buffer Strips*: Establishing rows of narrow strips of herbaceous vegetation across cropland	0.000

[1]Reference: NRCS 2008
[2]See Table E-6

Table E-6: Conservation Practice HSI Change—NRCS Conservation Practice Improvement Value for Fish and Wildlife

Habitat Function	Results in Negative HSI Value	Results in Positive HSI Value
(1) Fish and Wildlife—Food	Quantity and quality of food is unavailable to meet the life history requirements of the species or guild of species of concern.	Food availability meets the life history requirements of the species or guild of species of concern.
(2) Fish and Wildlife—Cover/Shelter	Cover/shelter for the species of concern is unavailable or inadequate. For aquatic species, this includes lack of hiding, thermal, and/or refuge cover.	The ecosystem or habit types support the necessary plant species in the kinds, amounts, and physical structure; and the connectivity of fish and wildlife cover is adequate to support, over time, the species of concern.
(3) Fish and Wildlife—Water	The quantity and quality of water is unacceptable for the species of concern.	The quantity and quality of water meets the life history requirements of the species of concern.
(4) Fish and Wildlife—Health	Lack of area and fragmentation of areas disrupt life history requirements of the species of concern.	Adequate area and connectivity of areas meet life history requirements of the species of concern. (Examples: staging areas for rest and feeding, lekking areas for breeding, migratory movement corridors).

Table E-7: Impacts and Conservation Practices (CP) Minimization of Covered Activities for Columbia Basin Pygmy Rabbit

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Pygmy Rabbit		CP Minimization	
				Key[2]	HSI-Acres	CP #	HSI-Acres
1.1	Dryland Agriculture	Conversion Activities	314 326 327 332 342	B	-0.6	314 326 327 332 342	-0.050 -0.040 0.034 0.028 0.020
1.2	Dryland Agriculture	Field Preparation	324 329 332 342 500	F	-0.25	324 329 332 342 370 500	0.000 0.010 0.028 0.020 0.000 0.032
1.3	Dryland Agriculture	Weed/Pest Control	324 329 332 338 595	G	-0.2	324 329 332 338 595	0.000 0.010 0.028 0.010 0.060
1.4	Dryland Agriculture	Infrastructure	332 382 394 472 500 560 575 645 741	P,F	0.25, -0.35	332 382 394 472 500 560 575 645 741	0.028 0.010 0.010 0.060 0.032 0.000 0.000 0.060 0.000
1.5	Dryland Agriculture	Crop Management	327 329 332 342 382	P,F	0.25, -0.25	327 329 332 342 382	0.034 0.010 0.028 0.020 0.010

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Pygmy Rabbit		CP Minimization	
				Key[2]	HSI-Acres	CP #	HSI-Acres
1.5 (cont.)	Dryland Agriculture	Crop Management (cont.)	386 472 560 561 595	P,F	0.25, -0.25	386 472 560 561 595	0.035 0.060 0.000 0.020 0.060
2.1	Rangeland	Range Improvement	314 338 342 370 460 472 550 595	P,D	0.5, -0.5	314 338 342 370 460 472 550 595	-0.050 0.010 0.020 0.000 -0.090 0.060 0.054 0.060
2.2	Rangeland	Range Infrastructure	382 394 472 560 561 574 583 614	F	-0.25	378 382 393 394 472 560 561 614	0.010 9.010 0.050 0.010 0.060 0.000 0.020 0.013
2.3	Rangeland	Livestock Management	528 560 561	P,D	0.5, -0.5	528 560 561	0.027 0.000 0.020
3.1	Irrigated Agriculture	Crop Maintenance	329 331 500 560 561	-	-	-	-

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Pygmy Rabbit		CP Minimization	
				Key[2]	HSI-Acres	CP #	HSI-Acres
3.2	Irrigated Agriculture	Weed/Pest Control	314 324 326 327 329 393 595	-	-	-	-
3.3	Irrigated Agriculture	Infrastructure	382 386 393 428 430 472 500 521 560 561	-	-	-	-

[1]Applicable CPs, See Table E-2. [2]Impacts, See Table E-4.

Table E-8: Impacts and Conservation Practices (CP) Minimization of Covered Activities for Washington Ground Squirrel

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on WA Ground Squirrel		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
1.1	Dryland Agriculture	Conversion Activities	314 326 327 332 342	B	-0.6	314 326 327 329 332 342	-0.050 -0.040 0.034 0.010 0.028 0.020
1.2	Dryland Agriculture	Field Preparation	324 329 332 342 500	E	-0.4	324 329 332 342 370 500	0.000 0.010 0.028 0.020 0.000 0.032
1.3	Dryland Agriculture	Weed/Pest Control	324 329 332 338 595	I	-0.1	324 329 332 338 595	0.000 0.010 0.028 0.010 0.060
1.4	Dryland Agriculture	Infrastructure	332 382 394 472 500 560 575 645 741	P,F	0.25, -0.35	332 382 394 472 500 560 575 645 741	0.028 0.010 0.010 0.060 0.032 0.000 0.000 0.060 0.000

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on WA Ground Squirrel		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
1.5	Dryland Agriculture	Crop Management	327 329 332 342 382 386 472 560 561 595	P,F	0.25, -0.25	327 329 332 342 382 386 472 560 561 595	0.034 0.010 0.028 0.020 0.010 0.035 0.060 0.000 0.020 0.060
2.1	Rangeland	Range Improvement	314 338 342 370 460 472 550 595	P,D	0.5, -0.5	314 338 342 370 460 472 550 595	-0.050 0.010 0.020 0.000 -0.090 0.060 0.054 0.060
2.2	Rangeland	Infrastructure	382 394 472 560 561 574 583 614	F	-0.25	378 382 393 394 472 560 561 614	0.010 9.010 0.050 0.010 0.060 0.000 0.020 0.013
2.3	Rangeland	Livestock Management	528 560 561	P,G	0.2, -0.2	528 560 561	0.027 0.000 0.020

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on WA Ground Squirrel		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
3.1	Irrigated Agriculture	Crop Maintenance	329 331 500 560 561	-	-	-	-
3.2	Irrigated Agriculture	Weed/Pest Control	314 324 326 327 329 393 595	-	-	-	-
3.3	Irrigated Agriculture	Infrastructure	382 386 393 428 430 472 500 521 560 561	-	-	-	-

[1]Applicable CPs, See Table E-2. [2]Impacts, See Table E-4.

Table E-9: Impacts and Conservation Practices (CP) Minimization of Covered Activities for Columbian Sharp-tailed Grouse

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Columbian Sharp-tailed Grouse		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
1.1	Dryland Agriculture	Conversion Activities	314 326 327 332 342 460 500	B	-0.6	314 326 327 332 342 460 500	-0.050 -0.040 0.034 0.028 0.020 -0.090 0.032
1.2	Dryland Agriculture	Field Preparation	342 500	F	0.35	342 500	0.020 0.032
1.3	Dryland Agriculture	Weed/Pest Control	332 338 595	P,C	0.2, -0.55	332 338 595	0.028 0.010 0.060
1.4	Dryland Agriculture	Infrastructure	332 382 386 472 500 560 575 645 741	P,C	0.2, -0.55	332 382 386 472 500 560 575 645 741	0.028 0.010 0.035 0.060 0.032 0.000 0.000 0.060 0.000

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Columbian Sharp-tailed Grouse		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
1.5	Dryland Agriculture	Crop Management	327 329 332 342 382 386 472 560 561 595	P, E	02, -0.4	327 329 332 342 382 386 472 560 561 595	0.034 0.010 0.028 0.020 0.010 0.035 0.060 0.000 0.020 0.060
3.1	Rangeland	Range Improvement	314 338 342 370 460	P,C	0.2, -0.55	314 338 342 460 472	-0.050 0.010 0.020 -0.090 0.060
3.1 (cont.)	Rangeland	Range Improvement (cont.)	550 595			550 595	0.054 0.060
3.2	Rangeland	Infrastructure	382 472 500 560 561 574 575 614	P,G	0.2, -0.2	382 472 500 560 561 574 575 614	0.010 0.060 0.032 0.000 0.020 0.022 0.000 0.013

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Columbian Sharp-tailed Grouse		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
3.3	Rangeland	Livestock Management	528 561	P,G	0.2, -0.2	528 561	0.027 0.020
4.1	Irrigated Agriculture	Crop Maintenance	595 645	F	-0.35	595 645	0.060 0.060
4.2	Irrigated Agriculture	Weed/Pest Control	314 324 326 327 329 393 595	B	-0.6	314 324 327 329 393 394 595	-0.050 0.000 0.034 0.010 0.050 0.010 0.060
4.3	Irrigated Agriculture	Infrastructure	-	-	-	-	-

[1]Applicable CPs, See Table E-2. [2]Impacts, See Table E-4.

Table E-10: Impacts and Conservation Practices (CP) Minimization of Covered Activities for Greater Sage-grouse

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Greater Sage-grouse		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
1.1	Dryland Agriculture	Conversion Activities	314 326 327 332 342 460 500	B	-0.6	314 326 327 332 342 460 500	-0.050 -0.040 0.034 0.028 0.020 -0.090 0.032
1.2	Dryland Agriculture	Field Preparation	342 500	F	-0.35	342 500	0.020 0.032
1.3	Dryland Agriculture	Weed/Pest Control	332 338 595	P,C	0.2, -0.55	332 338 595	0.028 0.010 0.060
1.4	Dryland Agriculture	Infrastructure	332 382 386 472 500 560 575 645 741	P,A	0.2, -0.7	332 382 386 472 500 560 575 645 741	0.028 0.010 0.035 0.060 0.032 0.000 0.000 0.060 0.000
1.5	Dryland Agriculture	Crop Management	327 329 332 342 382 386 472 560 561	P, E	02, -0.4	327 329 332 342 382 386 472 560 561	0.034 0.010 0.028 0.020 0.010 0.035 0.060 0.000 0.020

Activity Number	Land Use	Covered Activity	Applicable CP Numbers[1]	Impacts on Greater Sage-grouse		CP Minimization	
				Key[2]	HSI-Acres	CP#	HSI-Acres
1.5 (cont.)	Dryland Agriculture	Crop Management (cont.)	595			595	0.060
2.1	Rangeland	Range Improvement	314 338 342 370 460 550 595	P,C	0.2, -0.55	314 338 342 460 472 550 595	-0.050 0.010 0.020 -0.090 0.060 0.054 0.060
2.2	Rangeland	Infrastructure	382 472 500 560 561 574 575 614	P,G	0.2, -0.2	382 472 500 560 561 574 575 614	0.010 0.060 0.032 0.000 0.020 0.022 0.000 0.013
2.3	Rangeland	Livestock Management	528 561	P,G	0.2, -0.2	528 561	0.027 0.020
3.1	Irrigated Agriculture	Crop Maintenance	595 645	-	-	-	-
3.2	Irrigated Agriculture	Weed/Pest Control	314 324 326 327 329 393 595	-	-	-	-
3.3	Irrigated Agriculture	Infrastructure	-	-	-	-	-

[1]Applicable CPs, See Table E-2. [2]Impacts, See Table E-4.

Douglas County Multiple Species Conservation Plan

Appendix F: Cultural Resources

Potential Impacts of Covered Activities on Historic Properties

Chapter 1 of the MSGCP includes a description of the National Historic Preservation Act of 1966 (NHPA) and the need for Federal Agencies to consider this act for projects receiving federal funding or federal permits. Under the MSGCP, Permittees will implement Covered Activities, but the exact location and activities on the ground will vary from farm to farm. Most Covered Activities undertaken by Permittees are unlikely to impact cultural resources, because they occur within areas that have already been farmed or ranched. Most undisturbed areas are likely to continue to be undisturbed. Certain site types, such as rock features (cairns, talus pits, talus burials), occur most often in positions on the landscape that will not be impacted or that can often be avoided with little difficulty. Nonetheless, there are some Covered Activities or BMPs that may include ground disturbance beyond the historic tillage zone or in areas not previously disturbed by farming activities, and depending on the location and scope may affect historic properties. Therefore, in some cases involved Federal agency may need to consider the NHPA. If a project is funded or permitted by NRCS, FSA, or another Federal agency, then that agency would need to consider the NHPA.

For MSGCP activities that do not have NRCS, FSA, or other Federal agency involvement, the USFWS, with assistance from FCCD, may provide technical assistance to evaluate possible historic properties and/or to help minimize affects to those historic properties. It is likely that the following activities will not have the potential to cause adverse effects on historic properties:

1. All disturbance within the normal tillage zone of any current or previously cultivated field as long as the subsequent work is no deeper than previous tillage.
2. Replacement of existing structures as they pertain to farm and ranch access roads (culverts, roads, cattle guards, water control structures) and as long as construction does not extend or exceed beyond previously disturbed limits and it occurs within a road prism.
3. Soil and water conservation, crop production efforts, or other general farm or ranch planning that will not cause new ground disturbance or lead to greater disturbances of previously disturbed areas.
4. Small-scale activities that involve little or no ground disturbance such as shovel holes, auger holes, probe holes, and/or core holes. This includes installation of typical fencing and fence posts.
5. In-stream structures that do not involve ground disturbing activities.
6. Flood-damage repairs to roads, bridges, water control structures, or dams when the facility is not of historic significance and the rehabilitation is to the previously disturbed area.
7. Removal of non-historic structures or buildings where there will be no ground disturbance.
8. A practice or activity installed on previously disturbed ground not exceeding the previous disturbance, including vegetation plantings not exceeding previous disturbance depths.

Most covered activities and Best Management Practices described in Appendix E would not typically require further NHPA review. The following activities, or similar activities covered in the MSGCP, may require technical assistance to evaluate or minimize potential impacts to historic properties:

1. Ground disturbing events deeper than any previous impact that are included in Covered Activities.
2. Farming field preparation—rock pile removal, if not clearly a pile of modern origin.
3. Farming or range infrastructure including livestock water, wildlife water, spring development, or ponds.
4. Irrigation activities with ground-disturbing irrigation structures.
5. Obstruction removal including removal of landscape features or potentially historic structures or buildings (note that activities on the farmstead associated with main buildings, houses, yards, etc., are not covered activities and therefore would not require review pursuant to NHPA).

Additional technical assistance would include the following process steps:

1. Permittee will share planned activity with FCCD.
2. The FCCD will notify the USFWS. USFWS has 30 days to respond and conduct any reviews. This process may be facilitated with development of a map of likely areas requiring additional review.

Douglas County Multiple Species General Conservation Plan

Appendix G: Landscape Monitoring Plan and HSI Model

Editor's Note

Appendix G explains how Landsat TM satellite imagery was utilized to monitor landscape habitat conditions in the MSGCP area. Using aerial photo interpretation, lands within Douglas County were classified and mapped into 23 land cover types. A Habitat Suitability Index (HSI) that incorporated several habitat components, including edge effect and soil depth, was developed for each species group (see page G-12) originally included in the MSGCP. A composite HSI was also developed for all seventeen species originally selected for coverage in the MSGCP grouped together. Finally, a HSI was developed for each species group based on Potential Natural Community.

The USFWS and FCCD decided to narrow an earlier list of 17 Covered Species down to four. See Appendix C, page C-8, for explanation of the selection process. Because maps in Appendix G were developed for larger species groups, rather than individual species, this appendix essentially remains in its original form. It still includes all 17 species covered by earlier drafts of the MSGCP. After the MSGCP is approved and implementation commences, current satellite imagery will be utilized to create new HSI maps specifically for the four species covered by the current Plan.

Overview

A requirement of Habitat Conservation Plans (HCP) is that projects be monitored for compliance within the terms of take permits and/or HCPs. In the case of regional or other large-scale or long-term HCPs such as the MSGCP, a monitoring program must provide long-term assurances that the HCP will be implemented correctly, that actions will be monitored, and that such actions will work as expected. This monitoring includes periodic accountings of take, consideration of surveys to determine species status in project areas or mitigation habitats, and progress reports on fulfillment of mitigation requirements (e.g., habitat acres acquired). Douglas County MSGCP monitoring plans evaluate target milestones and meet reporting requirements throughout the life of the HCP. They also address actions to be taken in cases of Unforeseen or Changed Circumstances (see Chapter 4).

The Douglas County MSGCP includes two levels of monitoring: 1) landscape monitoring and 2) farm-operations monitoring.

Landscape Monitoring Program

The Douglas County MSGCP covers lands exceeding one million acres. It was necessary to install a landscape-monitoring program that could take a periodic one-time "snapshot" of these extensive lands. After assessing cost and effectiveness, the use of Landsat TM satellite data emerged as the appropriate landscape monitoring approach. Satellite data will provide current, historic, and future satellite images of the entire GCP area. Though Landsat TM scenes may not be available in the future, new satellite sensor platforms and data can be made compatible with that collected by Landsat TM.

The original intent of the landscape-monitoring program was to collect and process a benchmark image against which future images could be compared. Future images will be collected and processed in a similar manner to document landscape changes in HCP habitats as the result of GCP conservation practices. Spatial HSI models were developed from the current image data and projected across the landscape to predict the long-term effects of proposed GCP CPs on Covered Species and habitats. Further, species-specific HSI models allowed the effect of CPs on future habitat conditions to be predicted by satellite images. These predictions may be confirmed by future satellite imaging.

Existing Landscape Habitat Suitability Index (HSI) (2005)

To determine the feasibility of using of Landsat TM satellite imagery for assessing current (2005) and future landscape-level HSI values for HCP monitoring, two images were collected in 2005 (April and July). The April image showed crops on agricultural land in an immature stage and the July image showed crops in a mature stage. An unsupervised classification using ERDAS Imagine 9 software was made of both images and a composite classification map was prepared in a 10-meter raster GIS file. Through aerial photo interpretation and group plat data, lands within Douglas County and a portion of nearby Grant County were classified and mapped into 23 land cover types.

Land Cover Types

1. Urban
2. Irrigated Forage Crops
3. Irrigated Orchard
4. Dryland Agriculture
5. Riparian, Large Trees and Shrubs
6. Three-tip Sagebrush, Moderate Cover
7. Three-tip Sagebrush, Dense Cover
8. Three-tip Sagebrush, Light Cover
9. Grasslands, Bare/Three-tip Sagebrush
10. Big Sagebrush, Moderate Cover
11. Big Sagebrush, Dense Cover
12. Stiff Sagebrush/Grasslands
13. Grasslands, Bare/Stiff Sagebrush
14. Bitterbrush, Moderate Cover
15. Bitterbrush, Dense Cover
16. Non-Shrub-steppe, Moderate Brush Cover
17. Non-Shrub-steppe, Dense Brush Cover
18. Non-Shrub-steppe, Light Brush Cover
19. Non-Shrub-steppe, Grasslands/Bare Ground
20. Grasslands, Burned 2005
21. Conifer Forest
22. Rock and Rubble, Talus
23. Water

It was difficult to interpret the spectral difference between sagebrush species using satellite imagery. However, with the use of 2006 NRCS Soil Survey Data, including Ecological Plat Data, the spatial distribution of communities dominated by 3-tip, big, or stiff sagebrush species could be differentiated with an acceptable level of accuracy.

Foster Creek Conservation District, with assistance from WDFW, identified which of the 17 species originally covered by the MSGCP occupy each of the dominant plant communities (land cover types). This occupancy list is shown in Table G-1a to G-1c.

A spatial HSI geographic information system model was used to determine the HSI for a given species across the landscape. The model used six components:

1. Ecological class
2. Patch size
3. Largest patch size for a given species where increasing size did not affect HSI value
4. Smallest patch size that might be occupied by a given species
5. Edge effect—distance of use from a preferred patch into a non-preferred patch habitat
6. Effective soil depth data for ground species

Patches of a given ecological class were "clumped" and "sieved" in discrete patch sizes from 0.1 acre to 1,000 acres wherever they existed within the HCP project area.

The WDFW determined that in Douglas County, a typical HSI value for patch sizes 10 acres and larger of moderate cover Three-tip Sagebrush community is 0.3 on a scale from 0 to 1. Using a semi-log projection of patch size in acres on the (x) linear scale and HSI value on the (y) log scale, a straight line is drawn or computed between 1 acres and 10 acres. Interpretations are made for patch acreage HSI values at the interim patch sizes. This provides the core HSI value for each Three-tip Sagebrush patch larger than one acre across the HCP project area. The smallest and largest patch sizes for which core HSI values are computed are shown in Table G-2.

Table G-1a: HSI Values by Land Cover Type for Species in Douglas County

Land Cover Type	**Maximum HSI Value for Species[1]**				
	Bald Eagle	**Brewer's Sparrow**	**Burrowing Owl**	**Peregrine Falcon/ Prairie Falcon**	**Golden Eagle**
Urban	--	--	--	--	--
Irrigated Forage Crops	0.05	--	--	--	--
Irrigated Orchard	0.10	--	--	--	--
Dryland Agriculture	--	--	--	--	--
Riparian	0.70	--	--	0.10	0.20
Three-tip Sagebrush, Moderate Cover	0.10	0.30	0.25	--	0.30
Three-tip Sagebrush, Dense Cover	0.10	0.40	0.15	--	0.30

Land Cover Type	Maximum HSI Value for Species[1]				
	Bald Eagle	**Brewer's Sparrow**	**Burrowing Owl**	**Peregrine Falcon/ Prairie Falcon**	**Golden Eagle**
Three-tip Sagebrush, Light Cover	0.10	0.20	0.35	--	0.30
Grasslands, Bare/Three-tip Sagebrush	--	--	--	--	0.10
Big Sagebrush, Moderate Cover	0.05	0.70	0.35	--	0.35
Big Sagebrush, Dense Cover	0.05	0.60	0.20	--	0.25
Stiff Sagebrush/Grasslands	0.05	0.25	--	--	0.20
Grasslands, Bare/Stiff Sagebrush	0.05	0.15	--	--	0.20
Bitterbrush, Moderate Cover	0.35	--	0.25	--	0.20
Bitterbrush, Dense Cover	0.35	--	0.10	--	0.20
Non-Shrub-steppe, Moderate Brush Cover	--	0.15	--	--	0.05
Non-Shrub-steppe, Dense Brush Cover	--	0.20	--	--	0.05
Non-Shrub-steppe, Light Brush Cover	--	0.10	--	--	0.05
Non-Shrub-steppe, Grasslands/Bare Ground	--	--	--	--	--
Grasslands, Burned 2005	--	--	--	--	--
Conifer Forest	--	--	--	0.05	--
Rock and Ruble, Talus	--	0.10	--	0.20	--
Water	--	--	--	0.20	--

[1]Maximum HSI value for largest patch size for a given species where increasing size did not affect HSI value.

Table G-1b: HSI Values by Land Cover Type for Species in Douglas County

Land Cover Type	Maximum HSI Value for Species[1]				
	Grass-hopper Sparrow	Lewis Wood-pecker	Logger-head Shrike	Columbia Basin Pygmy Rabbit	Greater Sage-Grouse
Urban	--	--	--	--	--
Irrigated Forage Crops	--	--	--	--	--
Irrigated Orchard	--	--	--	--	--
Dryland Agriculture	--	0.15	--	--	--
Riparian	--	0.15	0.30	--	--
Three-tip Sagebrush, Moderate Cover	0.40	--	0.10	0.10	0.05
Three-tip Sagebrush, Dense Cover	0.30	--	0.10	0.10	0.05
Three-tip Sagebrush, Light Cover	0.50	--	0.10	0.05	--
Grasslands, Bare/Three-tip Sagebrush	0.05	--	--	--	--
Big Sagebrush, Moderate Cover	0.20	--	0.15	0.40	0.60
Big Sagebrush, Dense Cover	0.10	--	0.15	0.30	0.70
Stiff Sagebrush/Grasslands	0.05	--	0.05	--	0.20
Grasslands, Bare/Stiff Sagebrush	0.10	--	0.05	--	0.10
Bitterbrush, Moderate Cover	0.20	--	0.25	--	0.05
Bitterbrush, Dense Cover	0.10	--	0.25	--	0.05
Non-Shrub-steppe, Moderate Brush Cover	--	--	0.15	--	--
Non-Shrub-steppe, Dense Brush Cover	--	--	0.10	--	--
Non-Shrub-steppe, Light Brush Cover	0.05	--	X0.05	--	--
Non-Shrub-steppe, Grasslands/Bare Ground	0.10	--	--	--	--

Land Cover Type	Maximum HSI Value for Species[1]				
	Grass-hopper Sparrow	Lewis Wood-pecker	Logger-head Shrike	Columbia Basin Pygmy Rabbit	Greater Sage-Grouse
Grasslands, Burned 2005	0.20	--	--	--	--
Conifer Forest	--	0.20	--	--	--
Rock and Ruble, Talus	--	--	--	--	--
Water	--	--	--	--	--

[1]Maximum HSI value for largest patch size for a given species where increasing size did not affect HSI value.

Table G-1c: HSI Values by Land Cover Type for Species in Douglas County

Land Cover Type	Maximum HSI Value for Species[1]					
	Sage Sparrow	Sage Thrasher	Columbian Sharp-tailed Grouse	WA Ground Squirrel	White-tailed Jack Rabbit	Willow Flycatcher
Urban	--	--	--	--	--	--
Irrigated Forage Crops	--	--	--	--	--	--
Irrigated Orchard	--	--	--	--	--	--
Dryland Agriculture	--	--	0.05	--	--	--
Riparian	--	0.05	0.50	--	--	0.15
Three-tip Sagebrush, Moderate Cover	--	0.30	0.10	0.40	0.20	--
Three-tip Sagebrush, Dense Cover	--	0.35	0.15	0.40	0.20	--
Three-tip Sagebrush, Light Cover	--	0.20	0.05	0.40	0.20	--
Grasslands, Bare/Three-tip Sagebrush	--	--	--	0.05	--	--
Big Sagebrush, Moderate Cover	0.60	0.70	0.05	0.50	0.50	--
Big Sagebrush, Dense Cover	0.70	0.70	0.10	0.40	0.40	--
Stiff Sagebrush/Grasslands	--	0.35	--	--	0.30	--

Land Cover Type	Maximum HSI Value for Species[1]					
	Sage Sparrow	Sage Thrasher	Columbian Sharp-tailed Grouse	WA Ground Squirrel	White-tailed Jack Rabbit	Willow Flycatcher
Grasslands, Bare/Stiff Sagebrush	0.25	0.15	--	--	0.30	--
Bitterbrush, Moderate Cover	--	0.20	0.10	--	--	--
Bitterbrush, Dense Cover	--	0.30	0.15	--	--	--
Non-Shrub-steppe, Moderate Brush Cover	--	--	--	--	--	--
Non-Shrub-steppe, Dense Brush Cover	--	--	--	--	--	--
Non-Shrub-steppe, Light Brush Cover	--	--	--	--	--	--
Non-Shrub-steppe, Grasslands/Bare Ground	--	--	--	--	--	--
Grasslands, Burned 2005	--	--	--	--	--	--
Conifer Forest	--	--	--	--	--	--
Rock and Ruble, Talus	--	--	--	--	--	--
Water	--	--	--	--	--	--

[1]Maximum HSI value for largest patch size for a given species where increasing size did not affect HSI value.

Table G-2: HSI Values for Species as Affected by Patch Size and Edge Effect

Species	Smallest Patch (Acres)	Largest Patch (Acres)	Edge Distance (FT)
Bald Eagle	5	1,000	Infinite
Brewer's Sparrow	1	10	60
Burrowing Owl	5	50	500
Peregrine/Prairie Falcon	5	1,000	Infinite
Golden Eagle	5	1,000	Infinite
Grasshopper Sparrow	1	10	50
Lewis' Woodpecker	15	300	300
Loggerhead Shrike	1	300	300

Species	Smallest Patch (Acres)	Largest Patch (Acres)	Edge Distance (FT)
Columbia Basin Pygmy Rabbit	10	500	30
Greater Sage-grouse	50	500	500
Sage Sparrow	250	1,000	50
Sage Thrasher	15	300	200
Columbian Sharp-tailed Grouse	1	250	500
Washington Ground Squirrel	1	500	100
White-tailed Jack Rabbit	1	10	1,000
Willow Flycatcher	1	10	100

Extending from the core patch of an ecologic class is an area of decreasing usable habitat by a given species. The extent of this decreasing habitat is a function of the usable patch size. Maximum distance of edge effect is directly associated with patch sizes having maximum HSI values. For example for sage thrasher, a 300-acre patch of Big Sagebrush, Moderate Cover (Table G-2) with an HSI value of 0.70 (Table G-1) would have an edge effect outward for 200 feet (Table G-2).

The HSI edge effect with distance from a given patch follows a nonlinear regression model. This model levels off at both extremes, that is, adjacent to the patch and at the maximum edge distance, whereas the center of the relationship curve is stretched out. The effect is represented by an S-shaped curve. Since the maximum HSI value for edge effect is immediately adjacent to the core patch, the minimum value of edge effect is at the maximum edge distance. The use of nonlinear HSI regression model for wildlife edge effect is described by the formula

$$Y = 1/(1+e(-bx))$$

where Y equals the HSI value between 0 and 1, b is a “stretch” constant (2) and x equals the distance in pixels (32.2 feet) from the core patch area. See Figure G-1 for visual example.

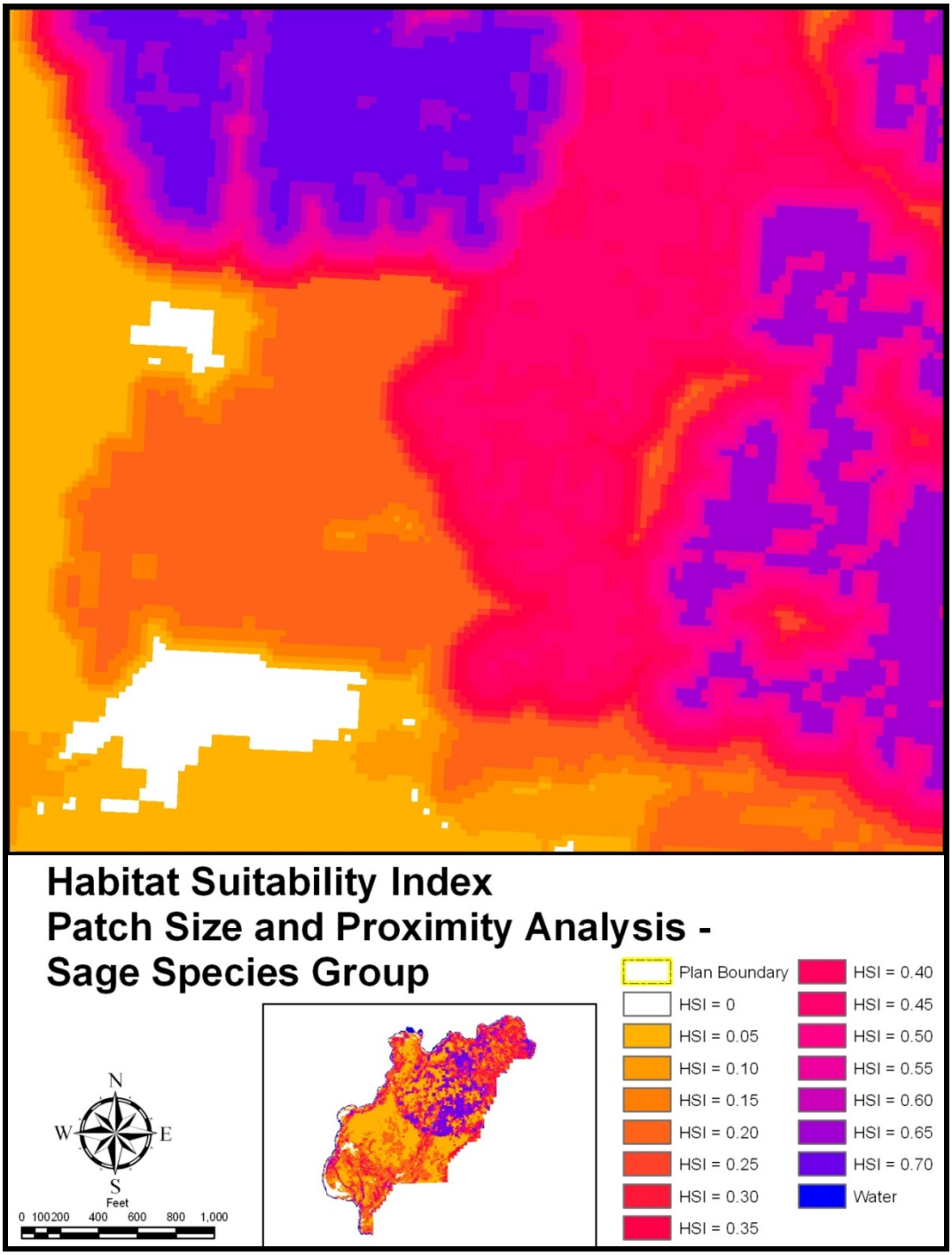


Figure G-1: Visual Example of Patch Size and Proximity Analysis, Sage Species

Again, using the sage thrasher example above with a core patch HSI of 0.7 and an edge effect of 200 feet, the HSI value would decay to 0.31 or less beyond 100 feet from the core patch. Tables were prepared for each unique edge effect distance to assist in identifying the appropriate HSI value for each pixel distance unit (32.2 feet) from the core patch area.

Certain MSGCP species are highly dependent upon soil conditions, particularly effective soil depth. Many of the project area soils are deep, but restrictive layers within the profile prevent or reduce use by burrowing wildlife, thereby reducing the soil's effective depth. Thus, to determine effective soil depth, a soil scientist reviewed the 500 soil map classes within the 2006 NRCS Soil Survey and grouped and remapped the soils according to the following effective depths:

1. Class One: Less than 12 inches effective depth including water
2. Class Two: 12 to 23 inches
3. Class Three: 24 to 47 inches
4. Class Four: Greater than 48 inches

Burrowing owls and Washington ground squirrels were assumed to require Class 3 and 4 soils while Columbia Basin pygmy rabbits were assumed to occupy predominately Class 4 soils.

Once the patch and edge effect relationships were established, a series of faster GIS overlays were prepared in the following sequence:

1. HCP areas were classified into discrete ecological classes.
2. Within each ecological class, all data was "clumped" into existing range of patch sizes.
3. Using the clumped data, ecological classes were "sieved" into desired patch sizes, from 0.1 to 1,000 acres, i.e., 1, 2.5, 5, 7.5, 10, 15, 25, 50, 75, 100 acres.
4. Using the guidelines provided in Tables G-1a to G-1C and G-2, an appropriate HSI value for each patch sizes was determined. Using a raster-based GIS overlay, the HSI value for each relevant patch sieved in sequence 2 was assigned on a HCP map base. Overlay maps were produced by giving preference to the maximum value existing in the underlying layers.
5. Once the patch overlay was complete, the edge effect spatial HSI values were prepared using pixel "search" and "recode" commands. In turn, the edge effect spatial HSI data was overlaid on the patch HSI spatial data. Once again, overlay maps were produced by giving preference to the maximum value existing in the underlying layers.
6. For ground species, an additional overlay was created using the HSI map with the effective depth soil depth map, creating a final landscape HSI distribution map for ground species.

These six steps were repeated for each of the MSGCP species. With the completion of the species overlays, the species were grouped into common life forms through additional GIS overlays. In early preparation stages of the Douglas County MSGCP, the following groups were used:

High-flyer Species

1. Bald Eagle
2. Peregrine Falcon
3. Prairie Falcon
4. Golden Eagle

Sage Species

1. Greater Sage-grouse
2. Sage Sparrow
3. Sage Thrasher
4. Columbian Sharp-tailed Grouse

Ground Species

1. Burrowing Owl
2. Columbia Basin Pygmy Rabbit
3. Washington Ground Squirrel
4. White-tailed Rabbit

Other Species

1. Brewer's Sparrow
2. Grasshopper Sparrow
3. Lewis' Woodpecker
4. Loggerhead Shrike
5. Willow Flycatcher

As implementation of the MSGCP progresses, maps and analysis of current conditions can be prepared using the same process described in preceding passages. Group maps are created by selecting the highest HSI value for a given pixel out of all species in that group. Similarly the "all" species map selects the highest HSI value for each pixel from all species.

Benchmark Conditions

Previous landscape conditions and the effects of CPs on wildlife habitat within the MSGCP area were obtained through a process similar to determining the 2005 existing conditions. Over the past 20 years, about 190,000 acres within the Project Area have been placed in Conservation Reserve Program (CRP). During this period, using cultural practices and natural plant succession, much of this CRP land is returning to a near-natural condition, which provides some benefits to Covered Species. The 2005 existing HSI conditions, as shown below, represent the current wildlife mitigated condition through the implementation of CRP.

By adjusting all CRP lands in the 2005 image back to dryland farm conditions, a benchmark HSI landscape condition can be simulated from which a differential or mitigation effect can be determined. Using identical raster-based GIS overlay processes as used for 2005 existing conditions, the temporal Benchmark HSI landscape distribution for the life form groups are comparatively shown in Figures G-2 through G-11. The positive mitigation effects of CRP on wildlife habitat suitability index (HSI) values are markedly visible in these ten analysis map

images, emphasizing the importance of maintaining these CRP lands and/or similarly managed lands.

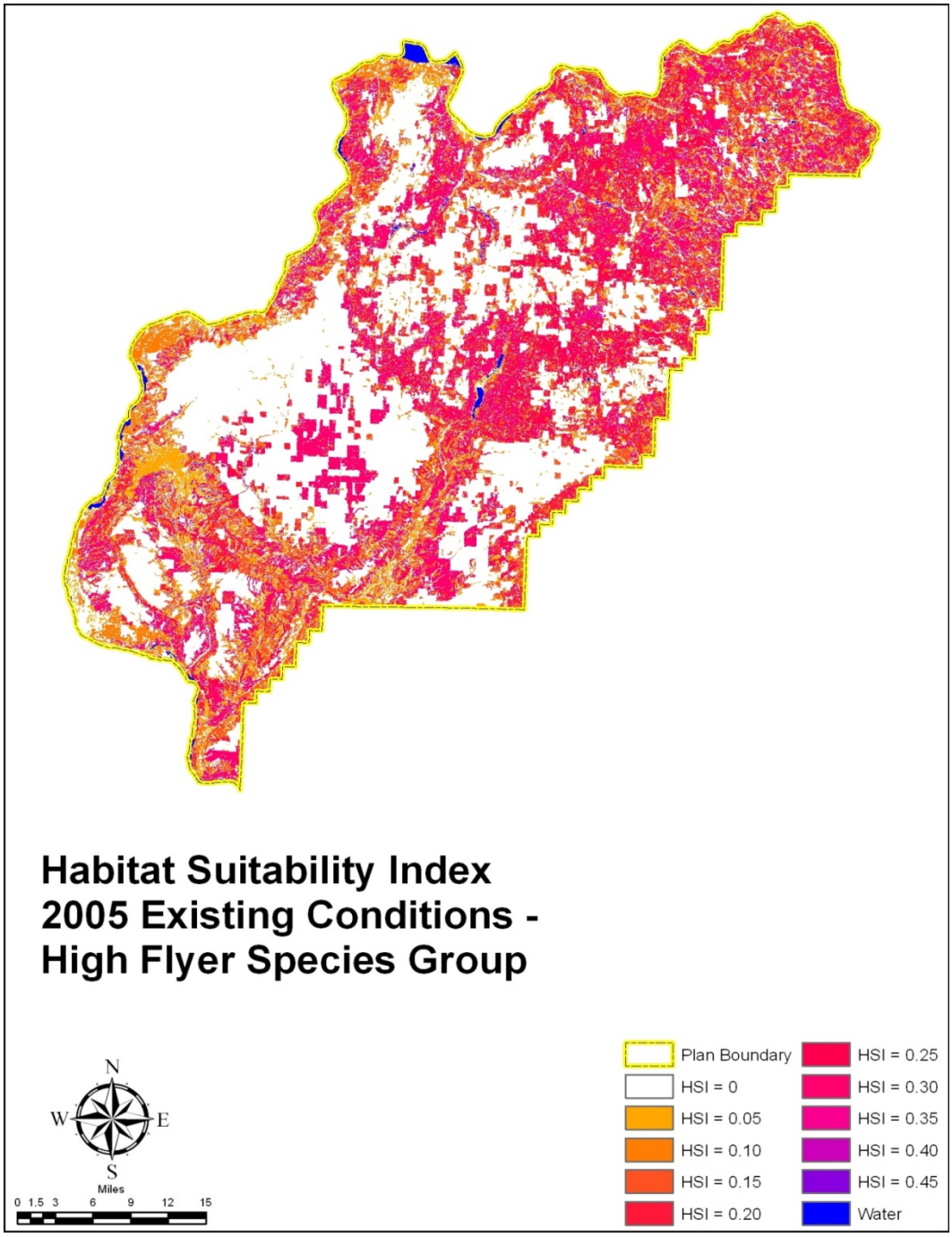


Figure G-2: Existing 2005 HSI Distribution Values for High-Flyer Species

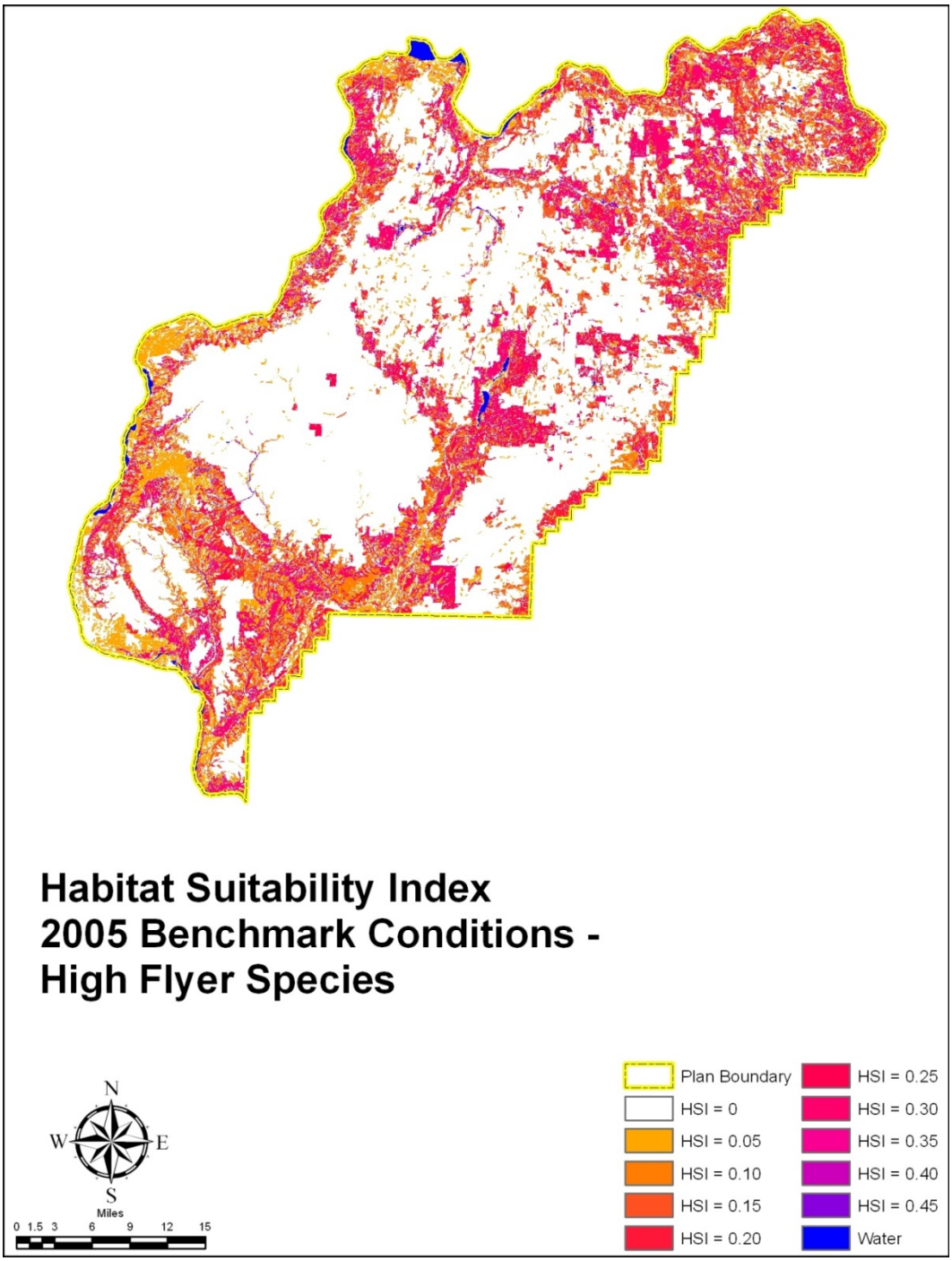


Figure G-3: Benchmark HSI Distribution Values (without CRP) for High-Flyer Species

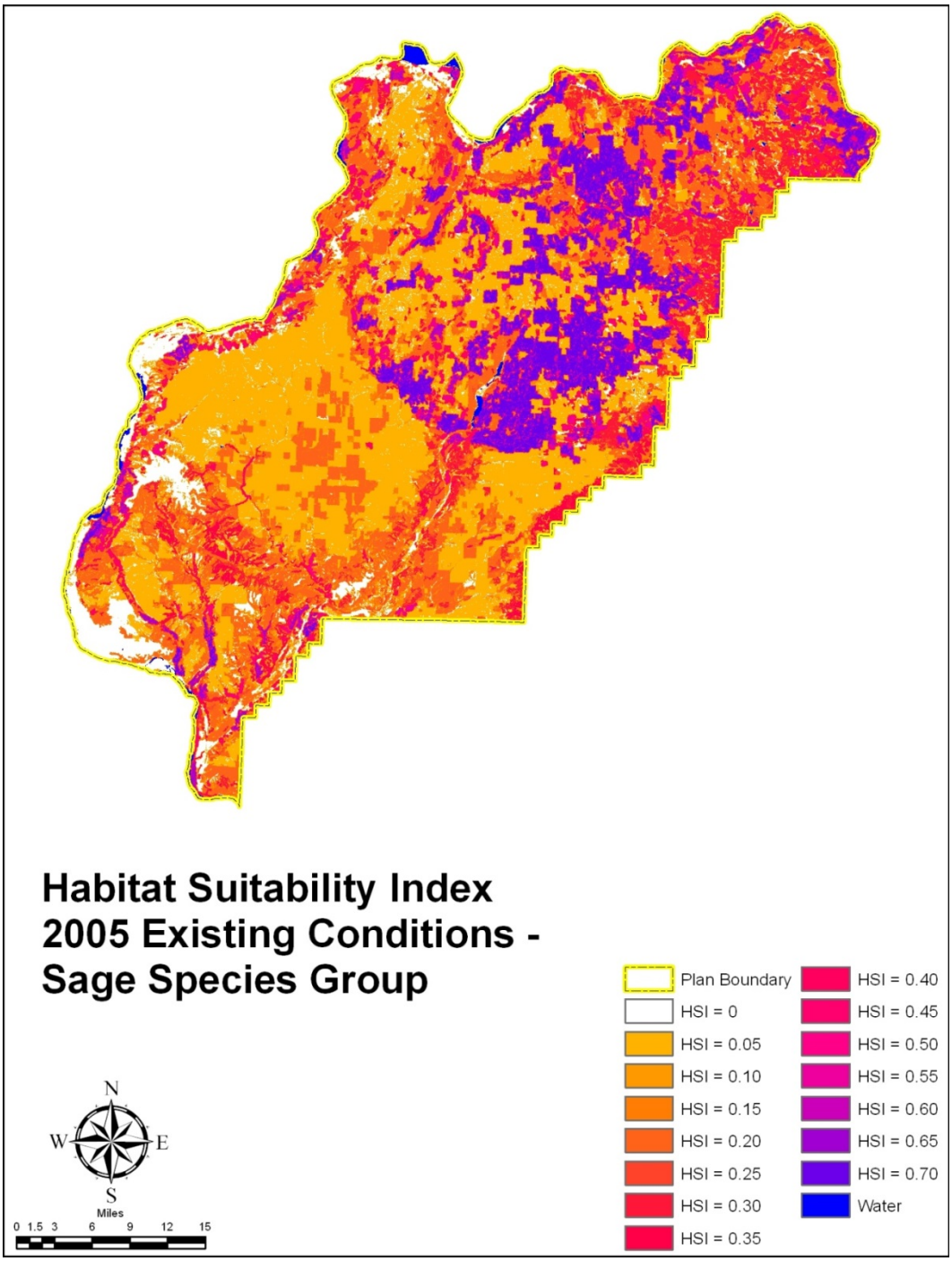


Figure G-4: Existing HSI Distribution Values for Sage Species

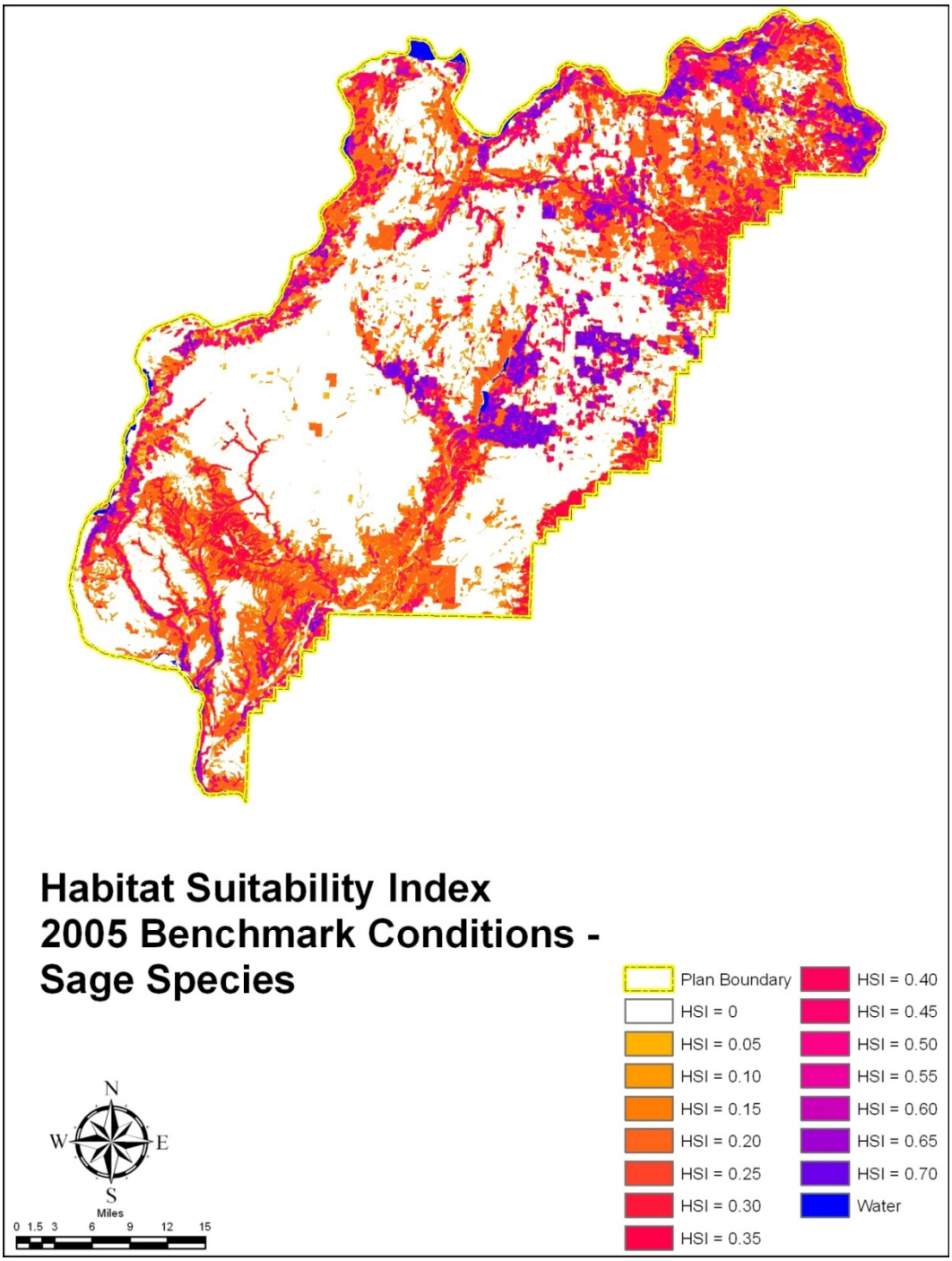


Figure G-5: Benchmark HSI Distribution Values (without CRP) for Sage Species

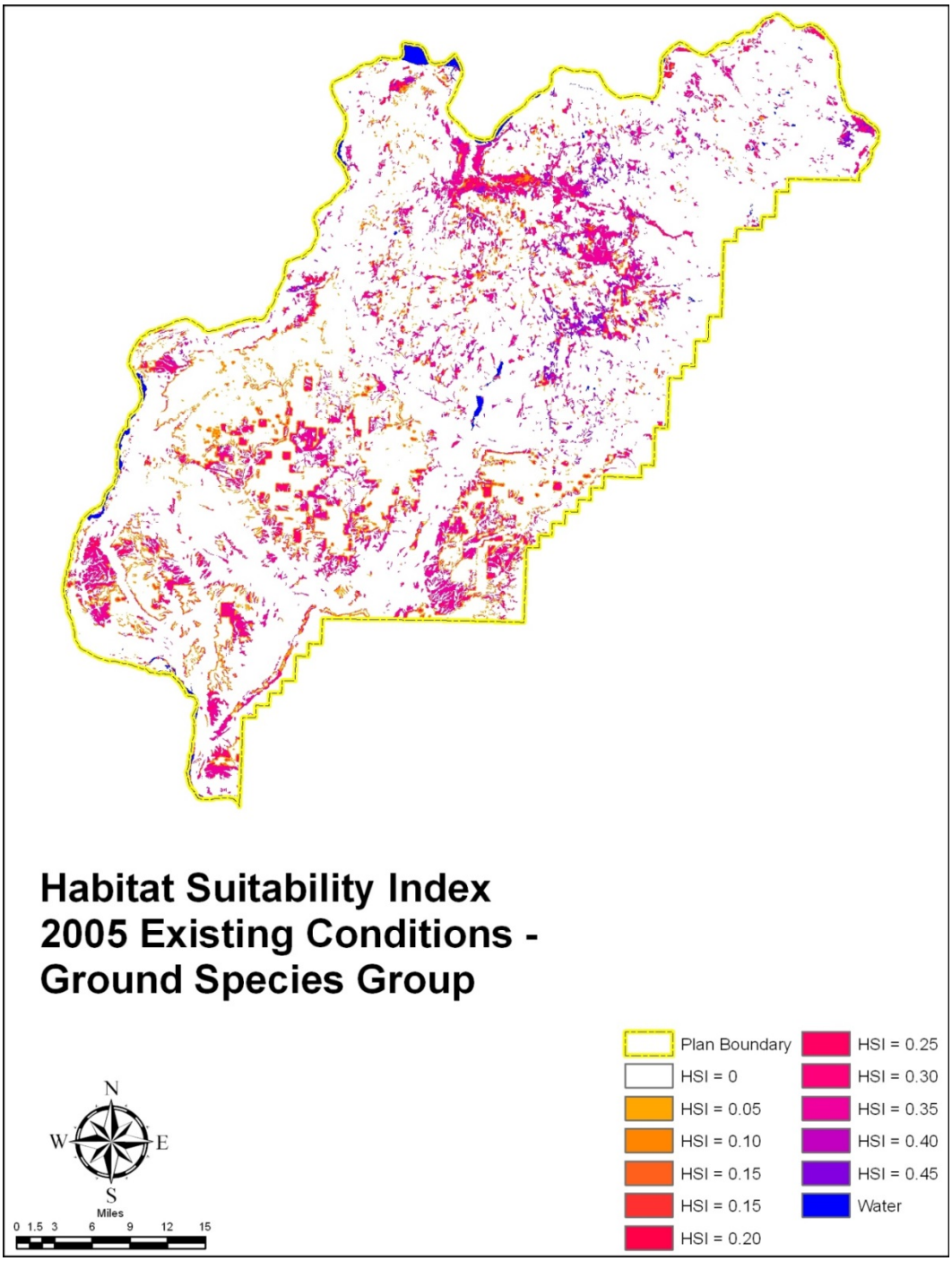


Figure G-6: Existing HSI Distribution Values for Ground Species

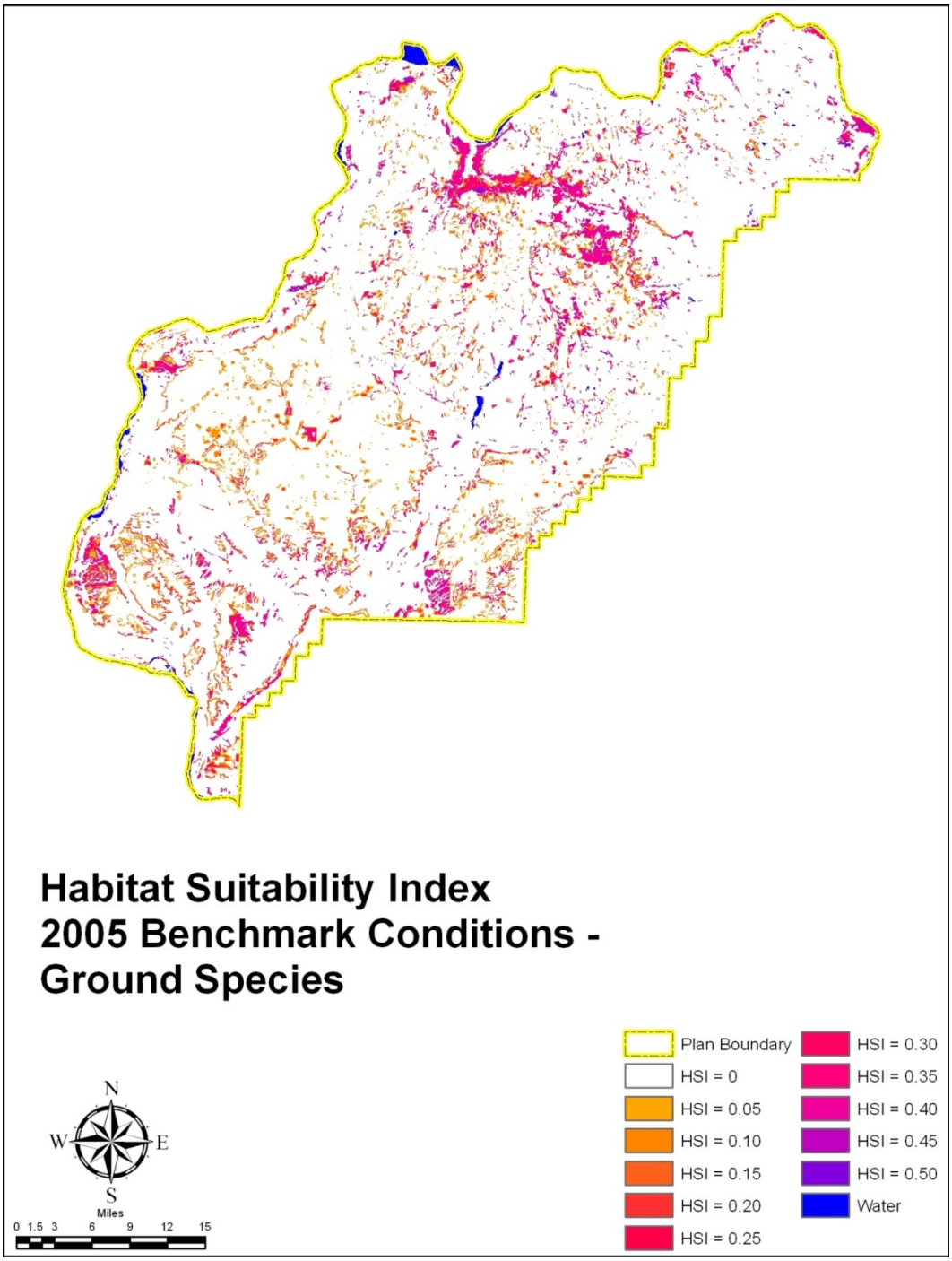


Figure G-7: Benchmark HSI Distribution Values (without CRP) for Ground Species

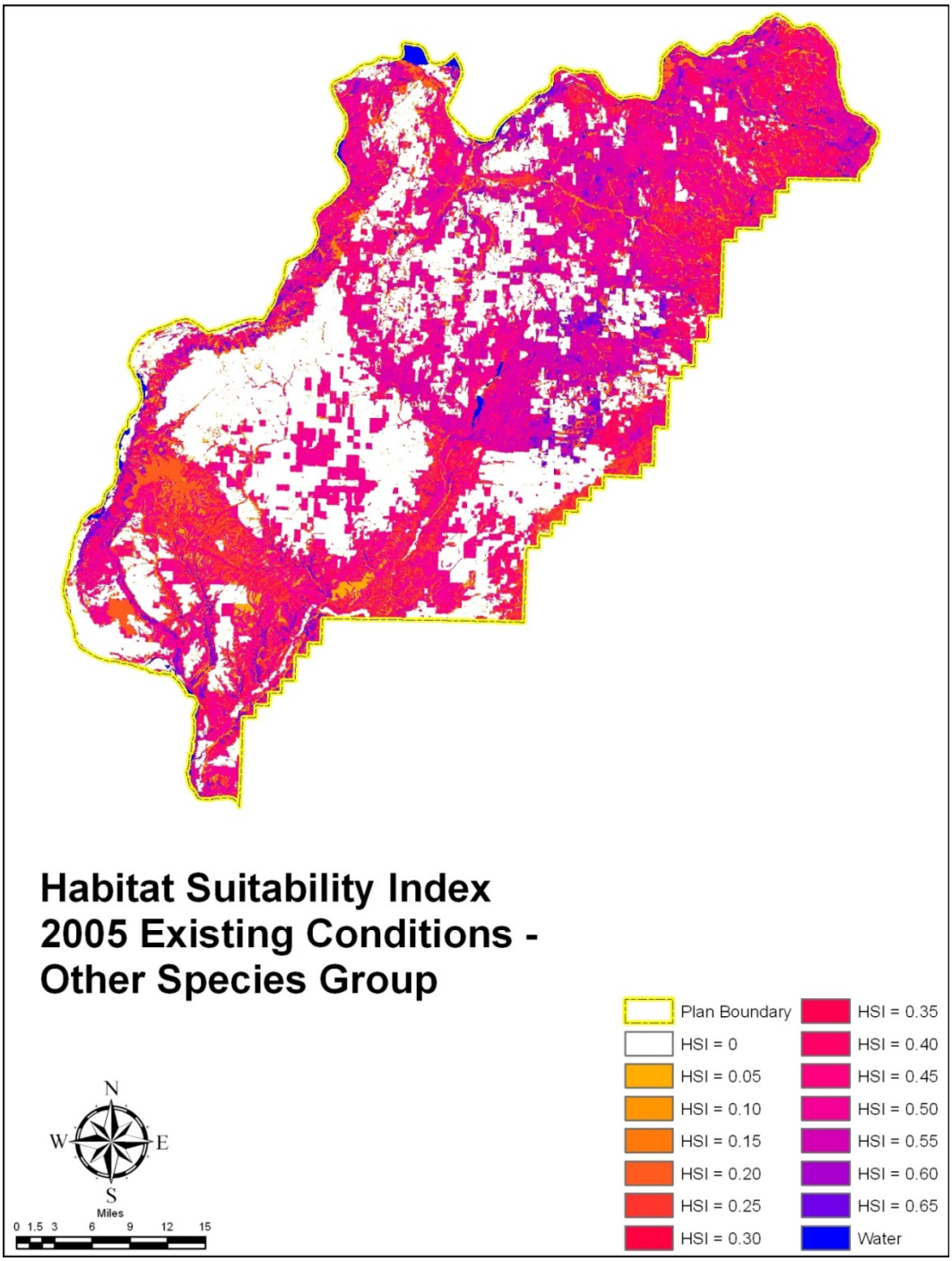


Figure G-8: Existing HSI Distribution Values for Other Species

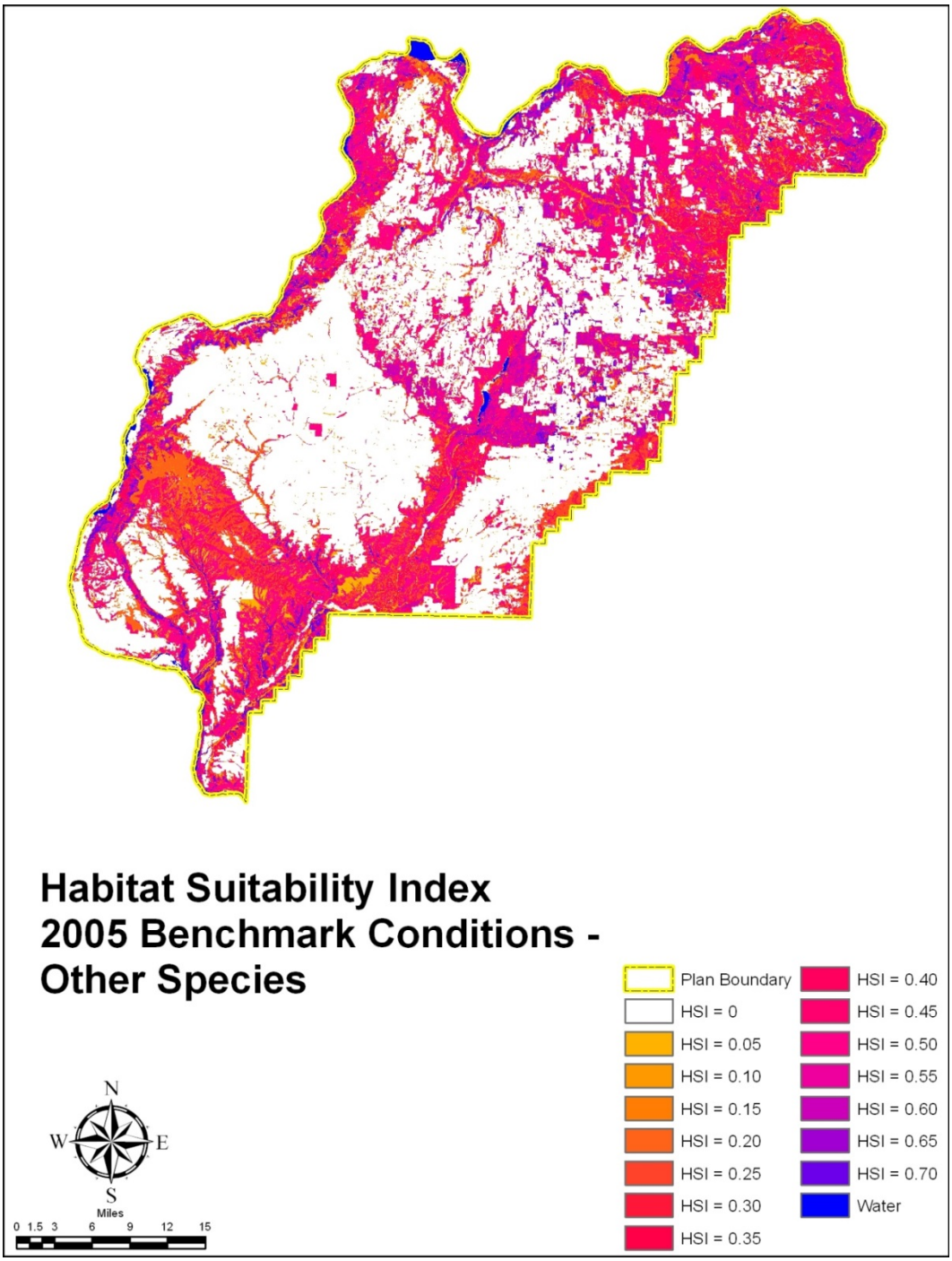


Figure G-9: Benchmark HSI Distribution Values (without CRP) for Other Species

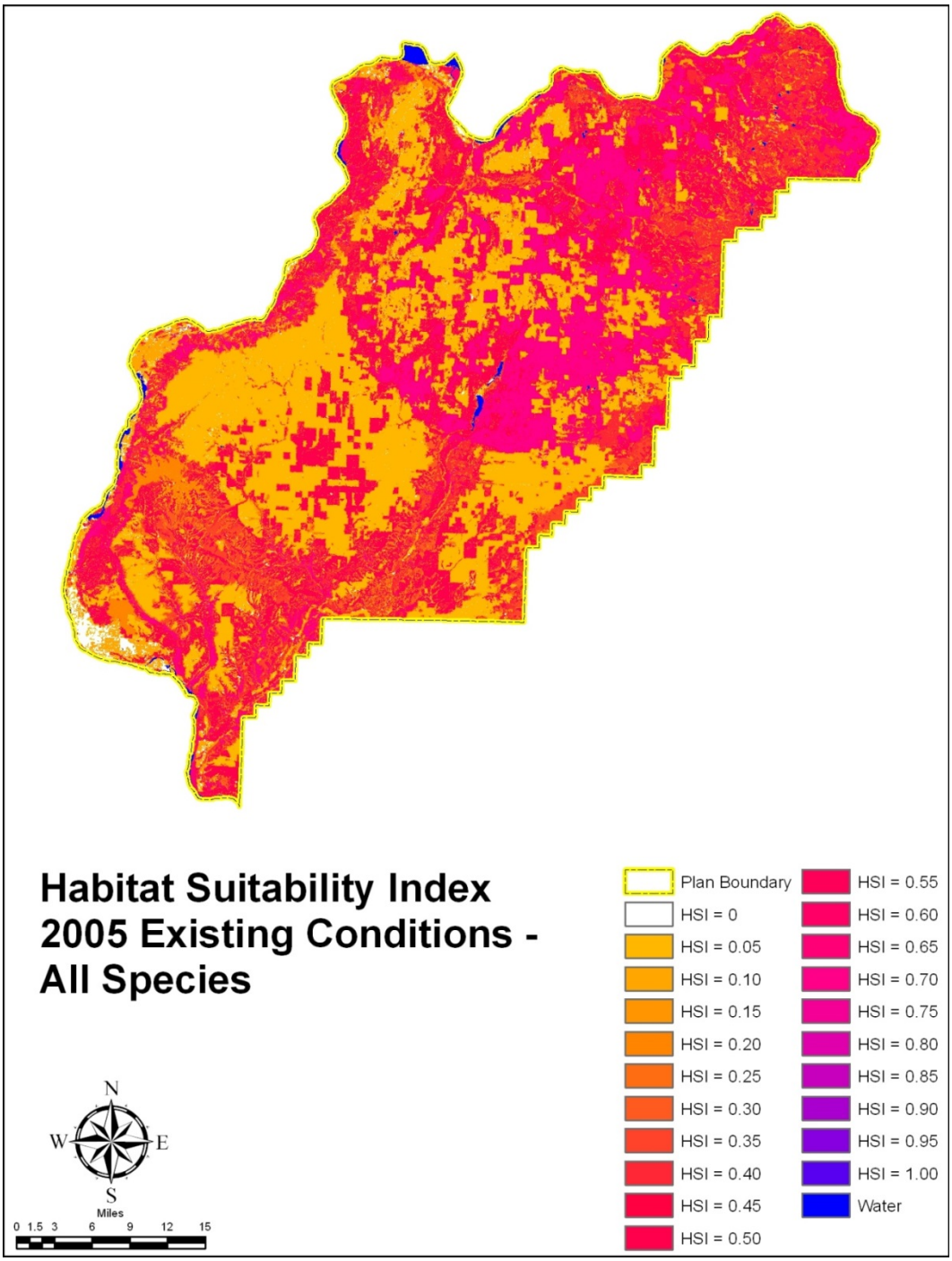


Figure G-10: Existing HSI Distribution Values for All Species

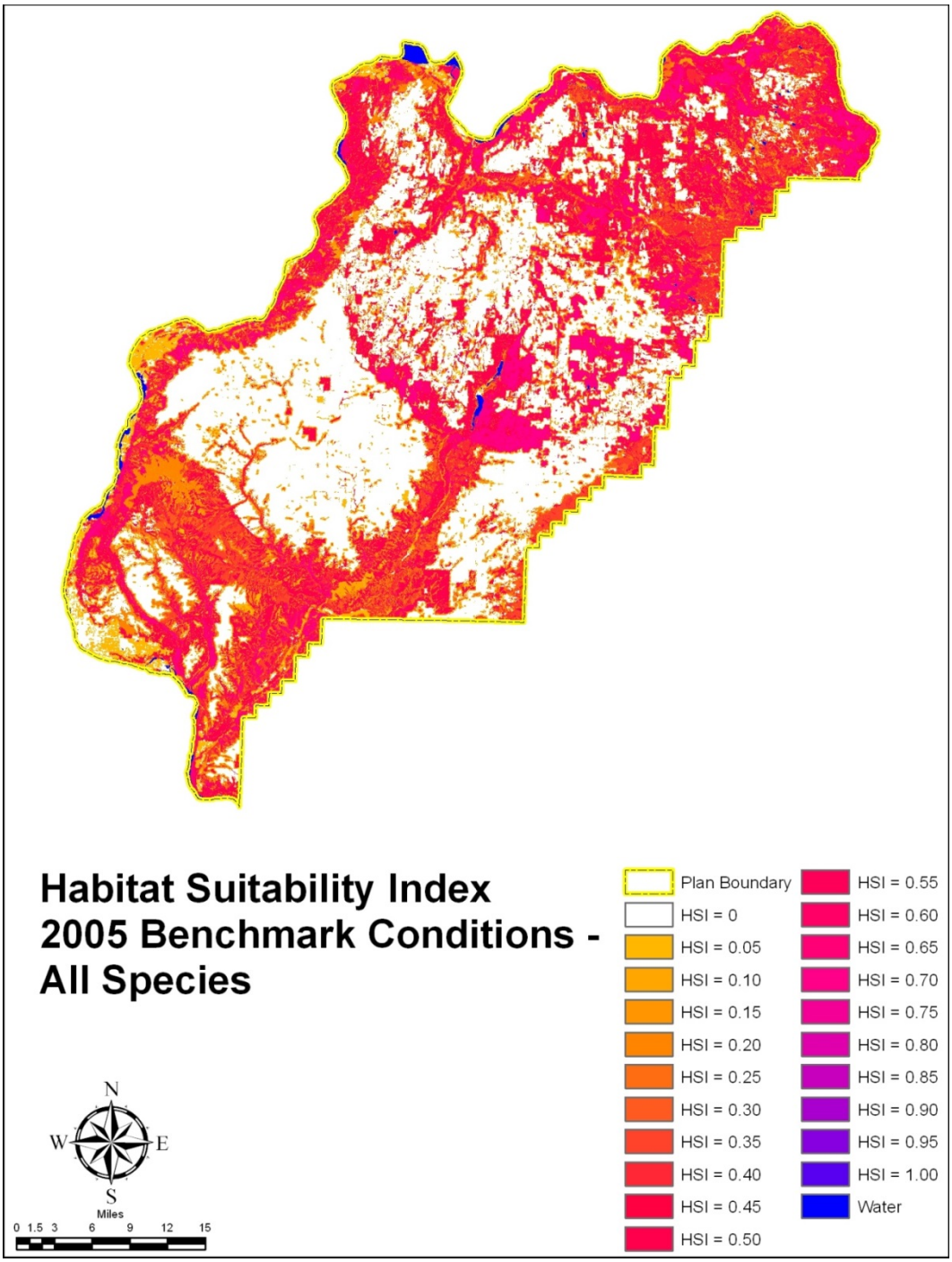


Figure G-11: Benchmark HSI Distribution Values (without CRP) for All Species

Potential Natural HSI Conditions

The NRCS Soil Survey provides the opportunity to create a map base of Potential Natural Conditions (PNC) for the Plan Area. Fifteen PNC ecologic classes have been identified (Tables G-3a, G-3b, and G-3c), as well as the MSGCP species that would most likely occupy these areas.

Using the same spatial analysis techniques described earlier, maps (Figures G-12 to G-16) have been prepared showing the PNCs (assuming current climatic conditions) for each of the 17 original species; these present the best possible natural conditions for comparative purposes. These potential natural habitat HSI values reflect an estimated five to ten percent continual habitat degradation by such natural disturbances as wildfire.

Table G-3a: Estimated Species Occupancy Rates by Ecologic Class

Land Cover Type	Occupancy Rates by Species[1]				
	Bald Eagle	**Brewer's Sparrow**	**Burrowing Owl**	**Peregrine/ Prairie Falcon**	**Golden Eagle**
Stiff Sage/Sandberg Bluegrass	0.10	0.20		--	0.20
3-Tip Sagebrush/Idaho Fescue	0.15	0.50		--	0.30
3-Tip Sagebrush/Big Sagebrush	0.15	0.60		--	0.30
3-Tip Sagebrush/Bitterbrush	0.15	0.40		--	0.30
3-Tip/Big Sage/Bitterbrush	0.15	0.40		--	0.30
Big Sage/Rabbitbrush	0.10	0.70		--	0.30
Big Sage/Bluebunch Wheatgrass	0.10	0.90		--	0.30
Big Sage/Bitterbrush	0.10	0.70		--	0.30
Big Sage/Bitterbrush/Wild Rye	0.60	0.70		0.10	0.40
Bitterbrush/Rabbitbrush	0.40	--		--	0.20
Bitterbrush/Douglas-fir	0.40	--		--	--
Bitterbrush/Ponderosa Pine	0.70	--		0.10	--
Non Shrub-steppe	0.25	0.20		--	0.05
Rock and Talus	0.05	0.20		0.20	--
Water	0.7	--		0.20	--

[1]An occupancy cell is displayed with the Maximum HSI value for largest patch size for a given species where increasing size did not affect HSI value.

Table G-3b: Estimated Species Occupancy Rates by Ecologic Class

Land Cover Type	Occupancy Rates by Species[1]					
	Grass-hopper Sparrow	**Lewis' Wood-pecker**	**Logger-head Shrike**	**Columbia Basin Pygmy Rabbit**	**Greater Sage Grouse**	**Sage Sparrow**
Stiff Sage/Sandberg Bluegrass		--		--	--	0.4
3-Tip Sagebrush/Idaho Fescue		--		0.20	0.20	--
3-Tip Sagebrush/Big Sagebrush		--		0.20	0.40	--
3-Tip Sagebrush/Bitterbrush		--		0.15	0.30	--
3-Tip/Big Sage/Bitterbrush		--		0.15	0.30	--
Big Sage/Rabbitbrush		--		0.5	0.75	0.8
Big Sage/Bluebunch Wheatgrass		--		0.65	0.90	0.9
Big Sage/Bitterbrush		--		0.50	0.60	0.7
Big Sage/Bitterbrush/Wild Rye		0.20		0.50	0.60	0.7
Bitterbrush/Rabbitbrush		--		--	--	--
Bitterbrush/Douglas-fir		0.15		--	--	--
Bitterbrush/Ponderosa Pine		0.30		--	--	--
Non Shrub-steppe		--		--	--	--
Rock and Talus		--		--	--	--
Water		--		--	--	--

[1]An occupancy cell is displayed with the Maximum HSI value for largest patch size for a given species where increasing size did not affect HSI value.

Table G-3c: Estimated Species Occupancy Rates by Ecologic Class

Land Cover Type	Occupancy Rates by Species				
	Sage Thrasher	**Columbian Sharp-tailed Grouse**	**Washington Ground Squirrel**	**White-tailed Jack Rabbit**	**Willow Flycatcher**
Stiff Sage/Sandberg Bluegrass	--	--	--	--	--
3-Tip Sagebrush/Idaho Fescue	0.45	0.20	0.50	0.4	--
3-Tip Sagebrush/Big Sagebrush	0.40	0.20	0.50	0.4	--
3-Tip Sagebrush/Bitterbrush	0.35	0.10	0.40	0.35	--
3-Tip/Big Sage/Bitterbrush	0.35	0.10	0.40	0.35	--
Big Sage/Rabbitbrush	0.75	0.20	0.70	0.7	--
Big Sage/Bluebunch Wheatgrass	0.80	0.20	0.70	0.7	--
Big Sage/Bitterbrush	0.70	0.15	0.60	0.65	0.25
Big Sage/Bitterbrush/Wild Rye	0.80	0.15	0.60	0.65	--
Bitterbrush/Rabbitbrush	--	--	--	0.2	--
Bitterbrush/Douglas-fir	--	--	--	--	--
Bitterbrush/Ponderosa Pine	--	--	--	--	--
Non Shrub-steppe	--	--	--	--	--
Rock and Talus	--	--	--	--	--
Water	--	--	--	--	--

[1]An occupancy cell is displayed with the Maximum HSI value for largest patch size for a given species where increasing size did not affect HSI value.

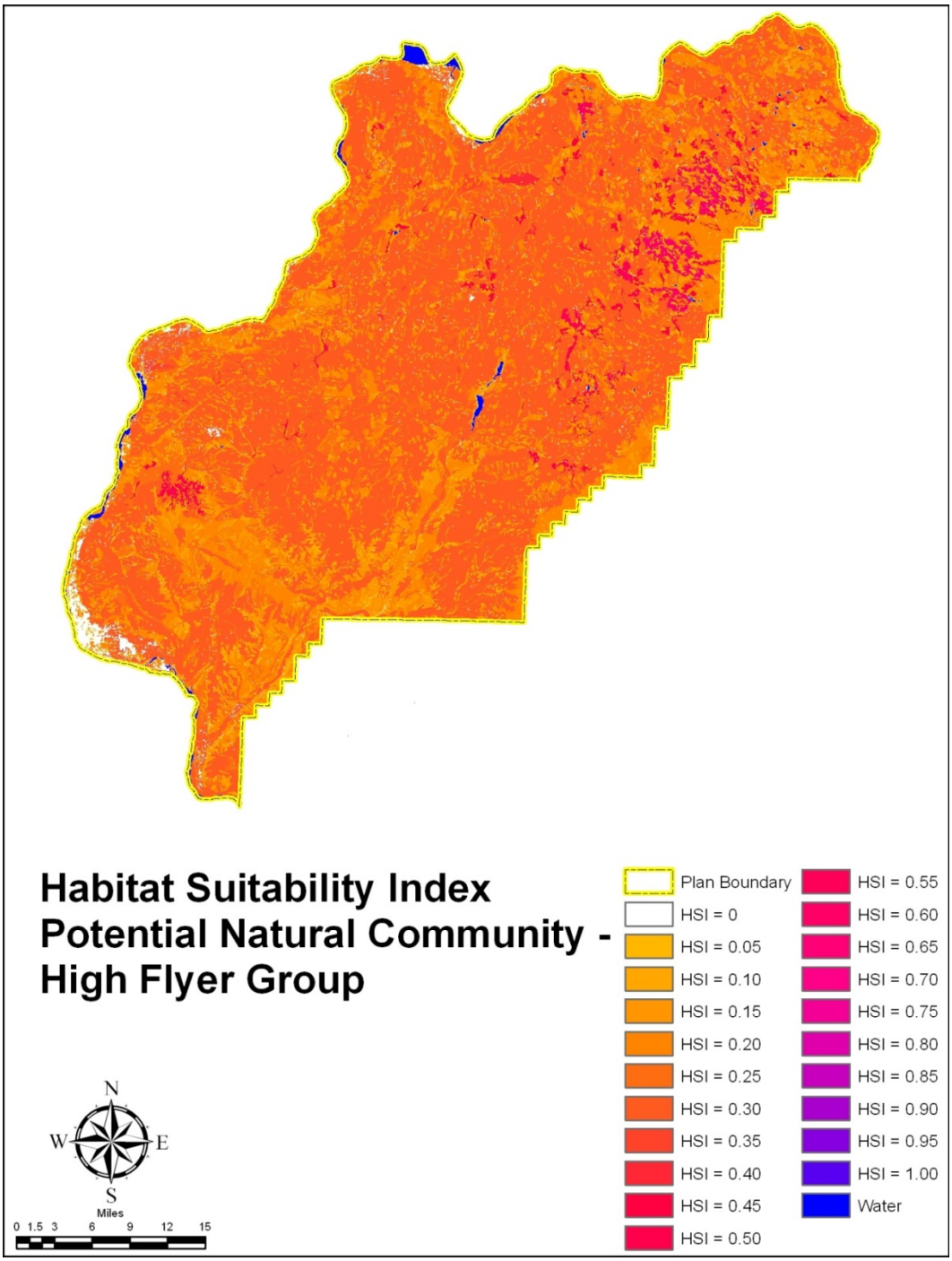


Figure G-12: Potential Natural Community HSI Distribution Values for High-Flyer Species

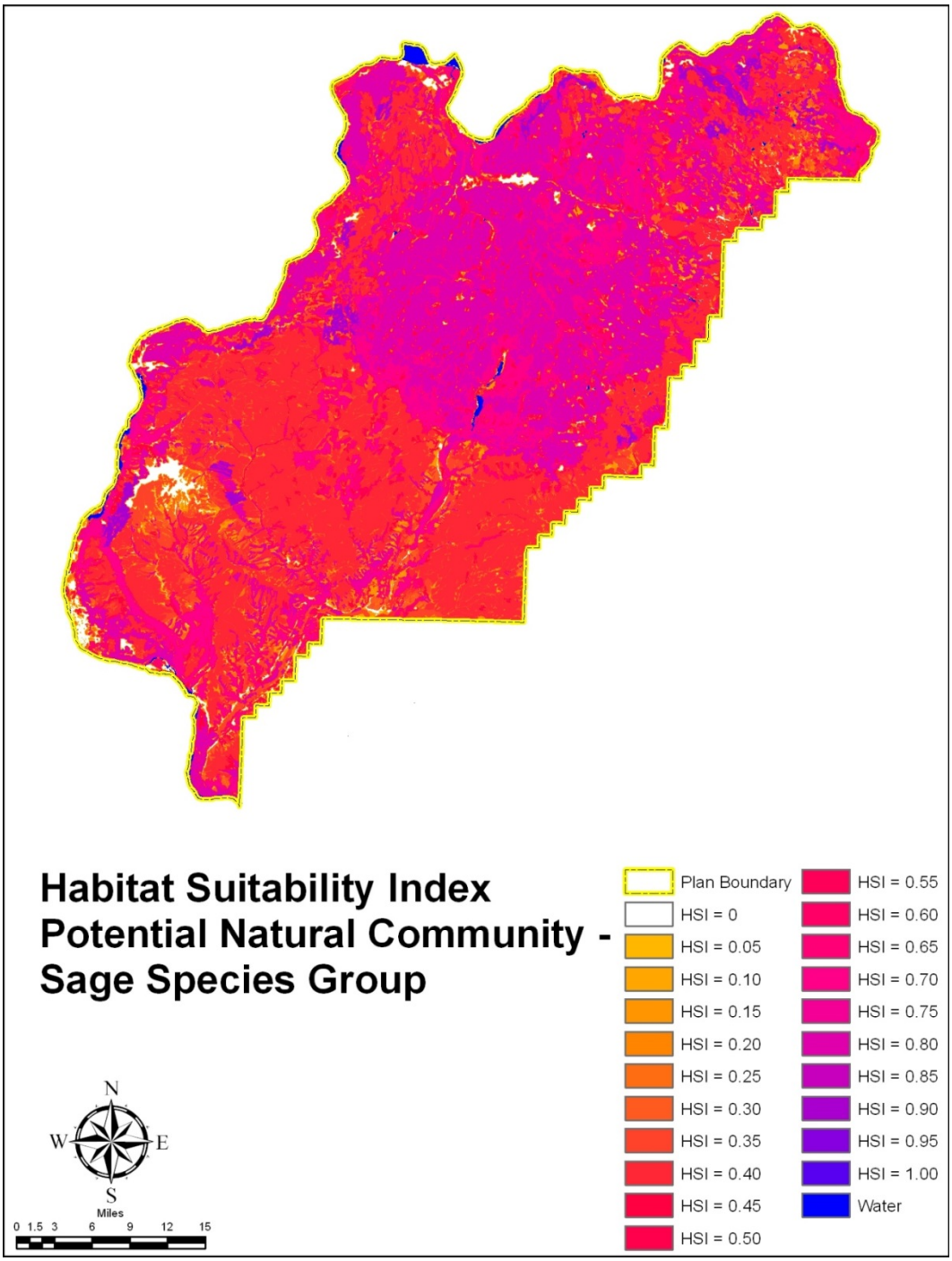


Figure G-13: Potential Natural Community HSI Distribution Values for Sage Species

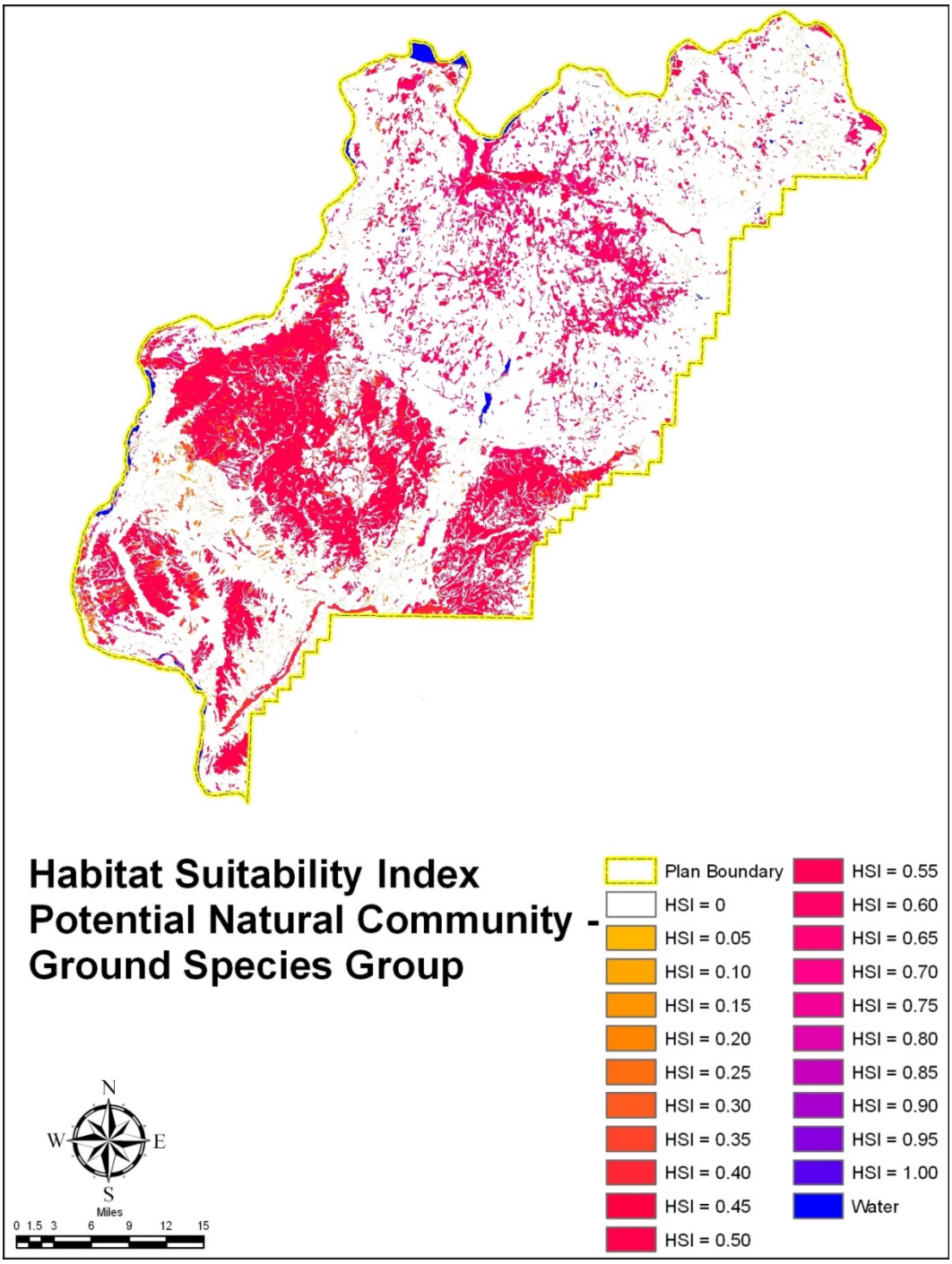


Figure G-14: Potential Natural Community HSI Distribution Values for Ground Species

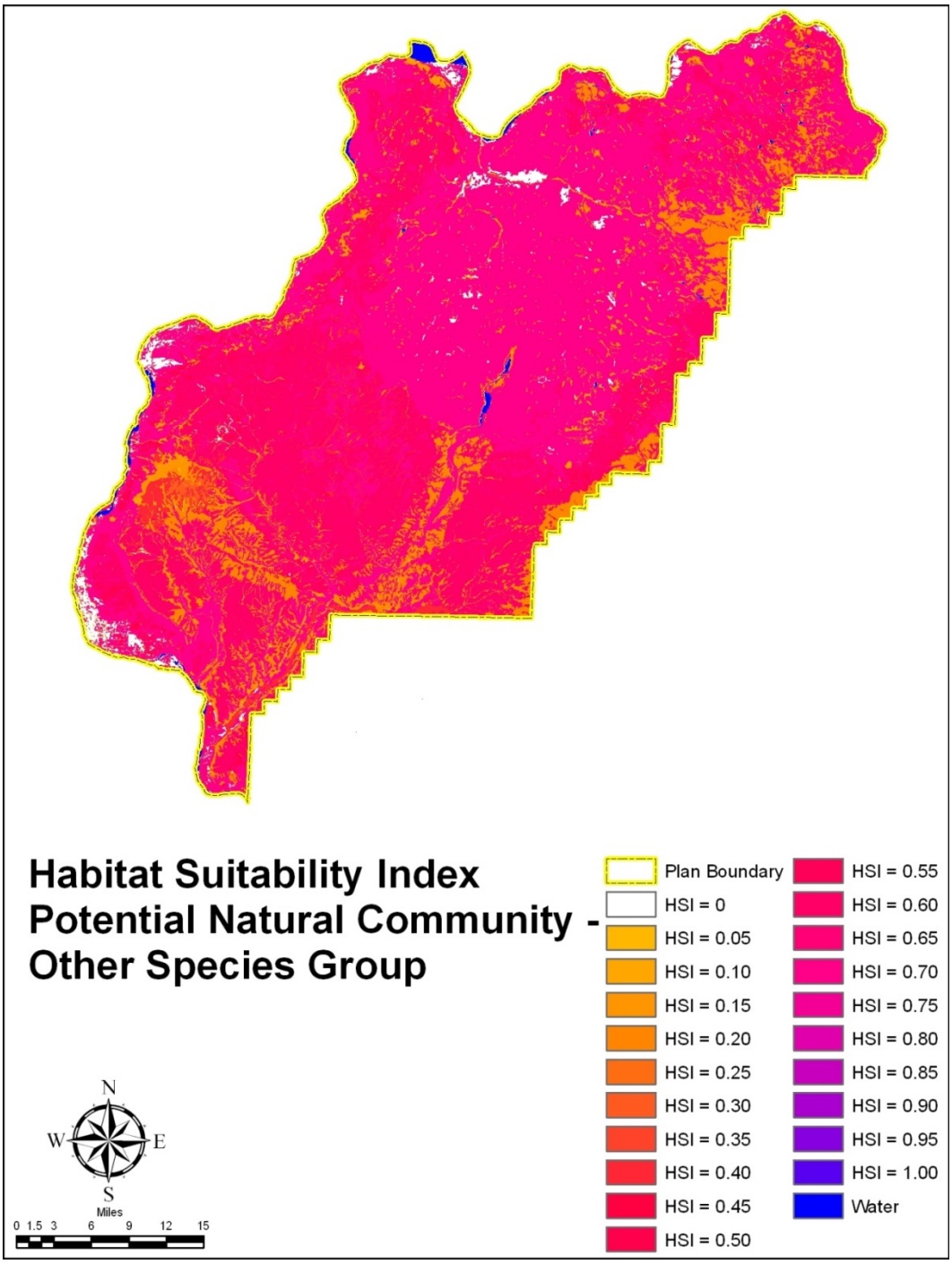


Figure G-15: Potential Natural Community HSI Distribution Values for Other Species

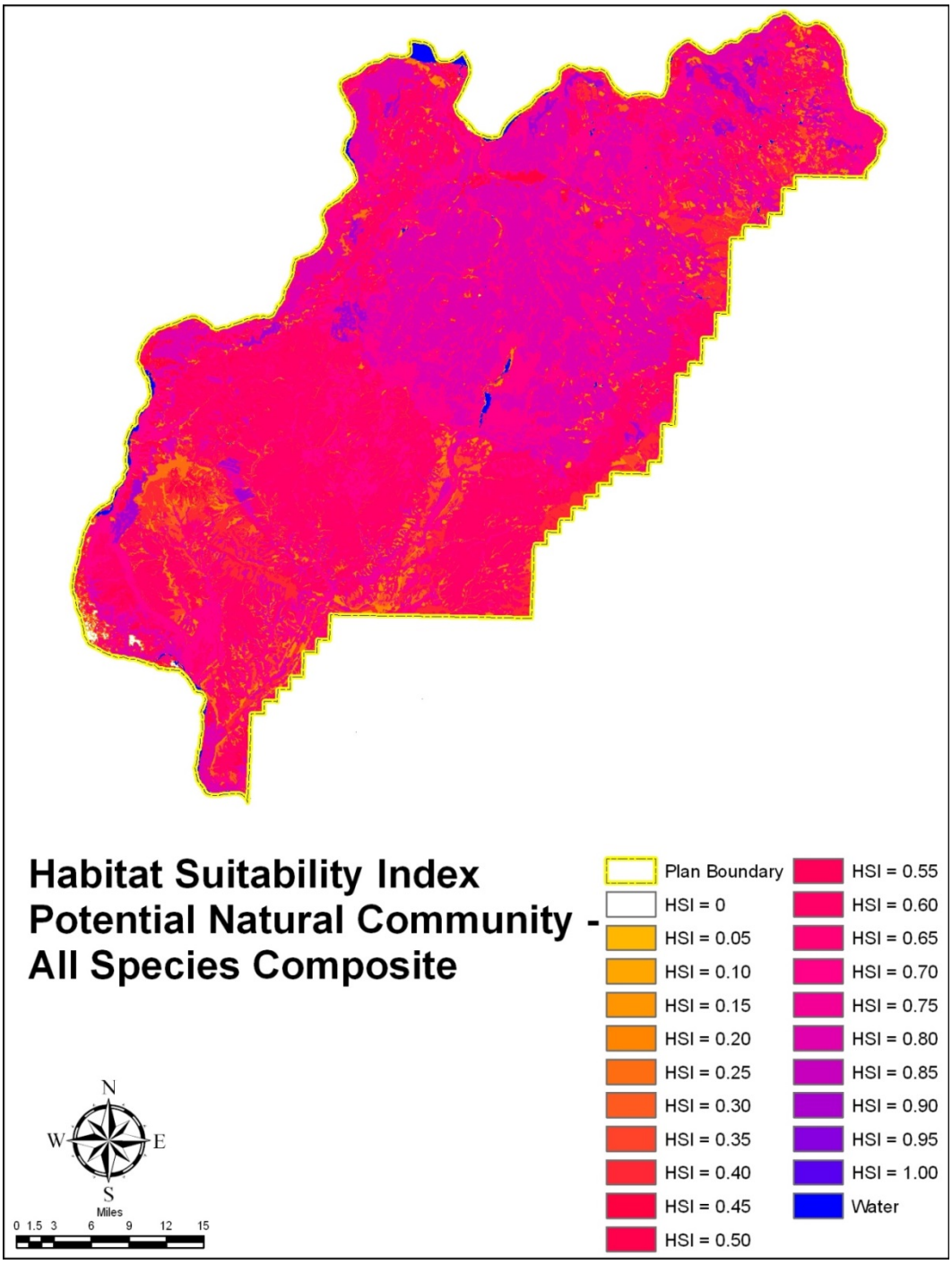


Figure G-16: Potential Natural Community HSI Distribution Values for All Species

Douglas County Multiple Species Conservation Plan

Appendix H: NRCS Farm Planning Process

Overview

The Douglas County MSGCP will utilize individualized Farm Plans developed for each Permittee to direct minimization and mitigation actions for agricultural activities as an initial step. These plans will be similar to those created in accordance with the USDA Natural Resources Conservation Service's *Part 600 National Planning Procedures Handbook*, which can be found online at http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=33234.wba.

The National Planning Procedures Handbook

The *National Planning Procedures Handbook* (NPPH) provides guidance on the planning process the Natural Resources Conservation Service (NRCS) uses to help develop, implement, and evaluate conservation plans for individuals and area-wide conservation plans or assessments for groups.

Planning involves more than considering individual resources. It focuses on the natural systems and ecological processes that sustain the resources. The planner strives to balance natural resource issues with economic and social needs through the development of a Resource Management System (RMS). The conservation planning process helps the planner and client accomplish the following:

1. Protect, conserve, and enhance natural resources.
2. Design alternatives that meet local resource quality criteria for identified resource issues.
3. Consider human concerns regarding achieving sustainable agriculture.
4. Consider the effects of planned actions on interrelated geographical areas (i.e., looking off-site, beyond the planning unit boundary).
5. Consider and explain the interaction between biological communities and society
6. Focus on ecological principles.
7. Consider the effects and interactions of planned systems and practices on natural resources, as well as on economic and social structures.
8. Assist with development of plans, regardless of scale, which will help achieve the client's and society's objectives.
9. Identify where knowledge, science, and technology need to be advanced.

Farm Plan Development Process

The USDA Conservation Security Program's *Self-Assessment Workbook* (2004) is a recommended planning tool (http://ias.sc.egov.usda.gov/Help/CSPWeb/docs/CSPWkBk.pdf) for developing a Farm Plan. Conservation planning is based on a desired future condition that is developed by the client for an individual conservation plan, or by the client and stakeholders, in the case of an area-wide conservation plan or assessment encompassing a watershed or other defined area. The conservation planning process, as described in this handbook, consists of nine

steps divided into three phases. It is a process that considers people and the resources they use or manage.

Phase I – Data Collection and Analysis

1. Identify problems.
2. Determine objectives (to include meeting MSGCP goals if higher than CP objectives).
3. Inventory resources.
4. Analyze resource data.

Note: The Collection and analysis of data could utilize any approved agency format including:

1. NRCS Checklist of Resource Problems or Conditions for WA State and associated mapping protocols.
2. WDNR Resource Assessment checklist.
3. WDFW HB 1309 Ecosystem Standards Checklist.
4. FCCD could develop a checklist specific for Douglas County.

Phase II – Decision Support

1. Formulate alternatives.
2. Evaluate alternatives.
3. Make decisions.

Note: Each alternative developed and evaluated for an operation will be based upon a NRCS Resource Management System comprised of a combination of approved CPs and resource management actions that, when applied, bring all natural resource concerns up to quality criteria. These practices and actions would meet or exceed minimum criteria for all CPs recommended for Covered Activities. Several of our Covered Species have land-use measures and species–specific measures that are higher or additional requirements than the standard NRCS CP. These requirements were developed by the PLC and TAC during the development of the MSGCP.

Phase III –Application and Evaluation

1. Implement the plan.
2. Evaluate the plan.

In summary, conservation planning deals with complete systems, rather than just parts of systems. The expected physical effects of conservation systems and practices are assessed in the context of ecological, economic, and social considerations as documented locally in the Field Office Technical Guide (FOTG). The expected impacts of those effects on natural resource quality, economic needs, and social objectives are then used to help develop and evaluate management alternatives.

Resource Management System

A resource management system is a combination of CPs and resource management activities, identified by land or water users, for the treatment of all resource concerns for soil, water, air, plants, and animals, which meet or exceed the quality criteria in the FOTG for resource sustainability.

Quality criteria for RMSs (see NPPH, Subpart D, Section 600.43) are approved by the State Conservationist and located in the FOTG, Section III. The NRCS Objective in the conservation planning process is to help each client attain a Resource Management System.

Conservation Management Unit (CMU)

Conservation planning on a specific farm, ranch, or other entity is done on a land unit basis using natural resource information to guide the client and planner. Land units in the same planning area may have similar soils and other natural resource conditions that require similar management systems and strategies. These land units can be aggregated for planning purposes. These aggregations are referred to as CMU's. This concept, when correctly applied, improves efficiency in planning and generally simplifies the process. The CMU concept can be used in development of individual conservation plans as well as area-wide conservation plans.

Conservation Plan

Conservation plans are voluntary, site-specific, comprehensive, and action-oriented. A conservation plan contains natural resource information and a record of decisions made by the client. It describes the schedule of operations and activities needed to solve identified natural resource problems and take advantage of opportunities. Using the planning process to develop conservation plans helps ensure that the needs of the client and the resources will be met, and that Federal, State, and local requirements will be achieved. Conservation plans should include all contiguous and non-contiguous land that is a part of the client’s enterprise, including owned and rented land.

A conservation plan may also be developed for a group where two or more decision-makers need assistance on planning, installing, and maintaining a conservation system crossing their land-unit boundaries. The land units involved in a conservation plan of this type are generally owned or directly controlled by the individuals involved. The group serves as the decision-maker (client). For example, solving problems associated with a stream that flows through several properties requires the coordinated, cooperative efforts of all individuals involved.

All natural resource problems and opportunities should be addressed during the planning process, including those identified by the client, those identified through the inventory process, those affected by existing regulatory and program requirements, and, based on the desires of the

client, those that would help meet natural resource objectives of an area-wide conservation plan where one exists.

The NRCS objective in conservation planning is to help the client achieve sound use and management of soil, water, air, plant, and animal resources to prevent their degradation, and assure their sustained use and productivity, while considering economic and social needs. Planning to an RMS level is necessary to meet sustained use of the resources.

Douglas County Multiple Species General Conservation Plan

Appendix I: Memorandum Of Understanding between FCCD and USFWS

MEMORANDUM OF UNDERSTANDING

between

FOSTER CREEK CONSERVATION DISTRICT

and

U.S. FISH AND WILDLIFE SERVICE

for

IMPLEMENTATION OF THE DOUGLAS COUNTY MSGCP

Introduction

The Foster Creek Conservation District has developed a Multiple Species General Conservation Plan (MSGCP) for agricultural landowners in Douglas County, Washington. The MSGCP has been developed with technical assistance from the U.S. Fish and Wildlife Service (USFWS). The MSGCP is intended to provide Endangered Species Act assurances to Douglas County agricultural landowners/operators (Permittees).

Statement of Purpose

The Douglas County MSGCP is intended to assist agricultural landowners/operators in Douglas County in obtaining Section 10(a)(1)(B) permits to agricultural landowners/operators in Douglas County. Due to the programmatic nature of the MSGCP, the FCCD and the USFWS recognize that supervision of progress, implementation, monitoring, and reporting is necessary. The FCCD agrees to oversee aspects of implementation of the MSGCP. The FCCD and USFWS agree that an ongoing adaptive management and monitoring program must be implemented for the MSGCP to achieve the goals of minimization and mitigation of impacts to the Covered Species.

Identification of Statutory Authorities

This MOU has been developed under the following authorities for Foster Creek Conservation District:

- Corporate Status and Powers of District (RCW 89.08.220 [4][5][8]) and Intergovernmental Cooperation Authority (RCW 89.08.341).

This MOU has been developed under the following authority for the USFWS:

- Fish and Wildlife Coordination Act, as amended (16 USC § 661[1]).

Responsibilities and Procedures

Foster Creek Conservation District (FCCD)

The FCCD commitments:

1. The FCCD will provide an annual funding plan and offer to meet with the Service by July 31 of each year to demonstrate funding adequacy for the next year, at minimum. If the FCCD cannot find adequate funds for implementation of the MSGCP, they will provide notice to the Service, and if adequate money for implementation is not found, the Service may revoke Permits issued under the GCP. Notify the Service at any point if funding levels fall below adequate levels for implementation.
2. At 10-year increments, review long-term factors that may potentially affect the performance of the MSGCP, such as climate change, new agricultural technologies, or introduction of invasive species. This review will be coordinated by the FCCD and will incorporate and analyze the trend data required to evaluate the performance of the MSGCP. The information developed will be reviewed and approved by the FCCD Board of Supervisors and reviewed by the USFWS.
3. Assist Permittees in implementation of the MSGCP, including but not limited to the following steps:
    a. Develop a Farm Plan using the Resource Management System (RMS) or similar process (see example in Appendix H). A Farm Plan must be completed in cooperation with each MSGCP Permittee or the Permittee's appointee and the FCCD.
    b. Determine general BMPs to implement in the GCP Site Plan. Farm Plans and specific CPs result in improved habitats, but many species need additional site-specific measures to minimize effects. These are additional or increased quality criteria for the specifically identified CPs in the Farm Plan.
    c. For the GCP Site Plan, as appropriate based on activities, ranges, and habitats, implement additional measures by land-use categories (Appendix E, page E-7) and species-specific measures (Appendix E, Table E-3). To determine need for species-specific measures, review species range maps and any known location data for Covered Species (Appendix D).
    d. After receipt of a Permit, monitor Farm Plan/GCP Site Plan implementation.
4. Review Farm Plans/Site Plans and refer adequate plans under the MSGCP to the USFWS.
5. Develop an annual report to document Permittees' compliance with the MSGCP. The annual report for the preceding calendar year will be submitted by June 30. Copies of the report will be made available to the public. Components of the annual report are described in the MSGCP Chapter 4. Notwithstanding the annual report, FCCD shall also immediately report significant compliance problems to USFWS.
6. Appoint a Douglas County MSGCP Administrator.

FCCD Board of Supervisors

FCCD Board of Supervisors commitments:

1. Provide policy direction for the implementation of the MOU and the MSGCP.
2. Provide opportunities for public participation in the decision-making process as appropriate.
3. Establish a Funding Coordination Committee and designate the Plan Administrator and key staff including the Monitoring Program Administrator.
4. Establish policies as appropriate under which the Funding Coordinating Committee will make recommendations to the Board of Supervisors.
5. Ensure covered MSGCP lands are managed as expected in Farm Plans/GCP Site Plans.
6. Coordinate with outside entities for specific services such as research or monitoring.
7. Develop and implement financing strategies to maximize funding sources to continue implementation of the MOU and the MSGCP.
8. Review MSGCP expectations annually.
9. Adopt an annual budget for implementation of the MOU and the MSGCP.
10. Act as custodian of records for information concerning MSGCP implementation.
11. Provide for the management and administration of the Implementation and Monitoring (IM) Committee. The FCCD will utilize the IM Committee to review and comment on final Farm Plans/GCP Site Plans and budgets submitted to the Plan Administrator. The major purpose of the committee will be to review and comment upon the progress of implementation of the MSGCP, to recommend expenditures, and to ensure that all interested groups have notice of and ability to comment on habitat-management decisions and implementation measures prior to funding by the MSGCP. This committee will meet as needed, but it is not intended to function as the day-to-day administrator of the Plan.
12. Implement the Adaptive Management and Monitoring Plan (AMMP) as described in Chapter 4.

U.S. Fish and Wildlife Service

USFWS commitments:

1. Continue to provide technical assistance during implementation of the MSGCP, including assistance with educational opportunities for Applicants/Permittees and other interested publics and assistance with cultural resources and NHPA as appropriate.
2. As feasible and appropriate, provide technical assistance to use other ESA tools or programs to conserve species and complement the MSGCP in Douglas County.
3. Advise FCCD on available grant opportunities.
4. Continue recovery plan development and implementation for Federally-listed species.
5. Inform the FCCD about any Federal species status reviews or listing proposals relevant to Douglas County.

6. Inform the FCCD about any critical habitat designations for Federally-listed species relevant to Douglas County.
7. As appropriate, support consolidation of public ownership into the Moses Coulee Management area or other key areas in Douglas County to provide HCA lands.
8. Conduct and/or review compliance monitoring to verify that actions are being accomplished on the ground as outlined in the MSGCP and reports. Monitoring on private land will be done with notice and permission, except that the USFWS may conduct inspections and monitoring in connection with the Permits in accordance with the ESA and its implementing regulations (50 C.F.R. § 13.47).
9. Review MSGCP Farm Plans/GCP Site Plans and Permit applications after referral by FCCD; process permit applications as appropriate.
10. Review monitoring and implementation reports for adequacy and compliance with MSGCP expectations.
11. Review Changed Circumstances and Unforeseen Circumstances and address them as described in the MSGCP.

FCCD and USFWS

The FCCD and USFWS mutually agree to the following:

1. Work cooperatively in MSGCP implementation to conserve species.
2. Maintain a record of the number of Permittees, acreages covered, and incidental take numbers and habitat loss data for each local Permittee.
3. During the first three (3) years of implementation of the MSGCP, the Plan Administrator and USFWS shall meet every 6 months if necessary to review the state of MSGCP implementation and thereafter, meet whenever necessary to discuss implementation issues.

Administrative Provisions

USFWS participation is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this MOU or the MSGCP will be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The USFWS will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures in writing. This MOU does not create an exclusive arrangement between the USFWS and the FCCD. This MOU shall not make or be deemed to make any party to this MOU the agent for or the partner of any other party.

Either Party may unilaterally terminate its participation in the agreement upon 30 days written notice to the other Party. However, FCCD's responsibilities under this MOU are essential to the proper implementation of the MSGCP so that failure to fulfill these responsibilities may void No

Surprises assurances for individual Permittees and USFWS may have to suspend or revoke individual permits.

This MOU will be reviewed by the FCCD and the USFWS every five years. If at that point no changes are required, then the MOU will continue for the next five-year period. This MOU may be amended or modified if both the FCCD and the USFWS agree.

This MOU becomes effective when the last party signs and the first MSGCP permit is issued. This MOU will continue for the life of the MSGCP.

The FCCD will obtain prior approval of all press releases, published advertisement, or other statements intended for the public that refer to this agreement or to the USFWS, the Department of Interior, or the name or title of any employee of the Department in connection with this agreement.

No Federal Contract; No Third-Party Beneficiaries. This MOU does not create an enforceable contract between the Parties. This MOU also does not create any right or interest in the public, or any permittee, as a third-party beneficiary hereof, nor shall it authorize anyone to maintain a suit for personal injuries or damages pursuant to the provisions of this MOU. The duties, obligations, and responsibilities of the parties to this MOU with respect to third parties shall remain as imposed under existing law.

No Limit on Federal Statutory Authority. Nothing in this MOU is intended to limit the authority of Federal agencies to seek penalties or otherwise fulfill their responsibilities under Federal law.

Dispute Resolution. The parties recognize that disputes concerning implementation of this MOU may arise from time to time. The parties agree to work together in good faith to resolve such disputes, using the informal dispute resolution procedures set forth below, or such other procedures upon which the parties may later agree. However, if at any time any party determines that circumstances so warrant, it may terminate its participation in the MOU as described above under administrative provisions without waiting to complete informal dispute resolution.

> Informal Dispute Resolution Process. Unless the parties agree upon another dispute resolution process, the parties may use the following process to attempt to resolve disputes. (a) The aggrieved party will notify the other parties of the basis for the dispute, and the requested resolution. (b) The other parties will have 30 days, or such other time as may be agreed, to respond. During this time the parties may seek clarification of the information provided in the initiation notice. The aggrieved party will use its best efforts to provide any information then available to it that may be responsive to such inquiries. (c) Within 30 days after such response was provided or was due, representatives of the parties having authority to resolve the dispute will meet and negotiate in good faith toward a solution satisfactory to all parties, or will establish a specific process and

timetable to seek such a solution. (d) If any issues cannot be resolved through such negotiations, the parties may consider non-binding mediation and other alternative dispute resolution processes and, if a dispute resolution process is agreed upon will make good faith efforts to resolve all remaining issues through that process.

Notices and Agency Contacts. Any notice required by this MOU shall be in writing, delivered personally or by overnight mail, to the persons listed below, or shall be deemed given five (5) business days after deposit in the United States mail, certified and postage prepaid, return receipt requested and addressed as follows, or at such other address as any party may from time to time specify to the other parties in writing. Notices may be delivered by facsimile or other electronic means, provided that they are also delivered personally or by overnight or certified mail. Notices shall be transmitted so that they are received within the specified deadlines.

Endorsements. Nothing in this MOU may be interpreted to imply that the United States, the Department of the Interior, or any agency of the Department endorses any service or policy of any other part. The parties will not take any action or make any statement that suggests or implies such endorsement.

Federal Advisory Committee Act. The parties will comply with the Federal Advisory Committee Act to the extent it applies.

By _____ _____

Washington Fish and Wildlife Office, Manager — Date
U.S. Fish and Wildlife Service

By _____ _____

Foster Creek Conservation District — Date
Waterville, Washington

Douglas County Multiple Species Conservation Plan

Appendix J: Additional Species' Profiles

Overview

The initial draft of the MSGCP (on file at Foster Creek Conservation District) listed seventeen Covered Species. During the revision process, the USFWS and FCCD decided to narrow this list, based on a decision matrix that included the following:

1. Is the species listed likely to be listed pursuant to the Endangered Species Act of 1973 (ESA) (16 U.S.C. §§1531-1544)?
2. Is the species found in Douglas County in areas where it could be significantly impacted by agricultural activities?
3. Does the species utilize agricultural areas of Douglas County for significant portions of its life cycle?
4. Is there sufficient research available that would indicate what management actions would benefit the species?

Through the selection process, four species were chosen for inclusion in the MSGCP as Covered Species—greater sage-grouse, Columbian sharp-tailed grouse, Washington ground squirrel, and Columbia Basin pygmy rabbit.

Appendix J describes the status and life history of the remaining thirteen species from the draft MSGCP. Applicants and Permittees may choose to do additional voluntary measures to conserve these species, but this is not required under the MSGCP.

Burrowing Owl (*Athene cunicularia*)
Status: Federal Species of Concern, State Candidate

The burrowing owl is a small, long-legged owl that inhabits open, dry landscapes of western North America, including well-drained grasslands, deserts, prairies, and shrub-steppe (Nordstrom 2004). They can also be found along the margins of agricultural areas and suburban developments (Nordstrom 2004).

Physical Description

Like most owls, burrowing owls have bright yellow eyes. They lack ear tufts and have a flattened facial disc. Burrowing owls have prominent white eyebrows and a white "chin" patch, which they expand and display during certain behaviors (Terres 1980; Sibley 2000; Alsop 2002).

Adult burrowing owls have brown upper-parts with white spotting. The breast and belly are white with variable brown spotting or barring. Juvenile owls lack most of the white spotting above and brown barring below. They have a buff bar across the upper wing, while their breast is buff rather than white (Terres 1980; Sibley 2000; Alsop 2002).

Males and females are similar in size and appearance. However, adult males sometimes appear lighter in color because they spend more time outside the burrow during daylight, and their feathers become sun-bleached. The average adult is slightly larger than an American Robin, at 25 cm (10 inches) in length, with a 53 cm (21 inches) wingspan, and a weight of 170g (6 oz.) (Terres 1980; Sibley 2000; Alsop 2002).

Nesting

As their name implies, burrowing owls nest in underground burrows, which are normally excavated by fossorial mammals. Burrowing owls are semi-colonial and often associated with prairie dog (*Cynomys* spp.) and Richardson's ground squirrel (*Urocitellus richardsonii*) colonies across the Great Plains and in prairies from southern Canada south to the Gulf Coast. Less commonly, burrowing owls nest in the burrows of marmots (*Marmota* spp.), armadillo (*Dasypus novemcinctus*), skunks (*Mephitis* spp.), foxes (*Vulpes* spp.), and coyotes (*Canis latrans*) (Dechant et al. 1999; Klute et al. 2003; Nordstrom 2004). Where the number of mammal burrows is limited, burrowing owls have been documented nesting in natural lava and rock cavities (Klute et al. 2003).

In the Pacific Northwest, burrowing owls often use abandoned badger burrows for nesting and may be dependent on badger burrows in the Columbia Basin (Green and Anthony 1989). In addition to nesting, burrows are used for shelter, protection from predators, food caches, roosting, and to reduce exposure to extreme temperatures (Larson 2009; Nordstrom 2004). Burrowing owls prefer a complex of available burrows in sandy or silt loam soils, with short and/or sparse vegetation that allows good visibility (Nordstrom 2004). Burrows may be located along road rights-of-way, along canal and ditch banks, in vacant lots, in pastures, and on golf courses (Klute et al. 2003; Smith et al. 2005) as these areas tend to provide the sparse vegetation cover burrowing owls prefer. Where natural burrows are not available due to habitat conversion or urban and industrial development, artificial burrows are being installed with considerable success (Conway et al. 2004; USFWS 2013).

Burrowing owls begin nesting in February, and juvenile owls emerge from the burrows in May (Nordstrom 2004). Conway et al. (2004) reported clutch sizes of 7.9 and 8.6 on two study sites in Eastern Washington. They also reported that 59 percent of nests at one study site produced at least one juvenile owl that reached 50 days of age, while 41 percent of nest at the second study site produced at least one juvenile owl that reached 50 days of age (Conway et al. 2004). Holmes et al. (2003) reported nesting success of 50 percent, 52 percent, and 67 percent for the years 1995, 1996, and 1997 in their study in north central Oregon. Green and Anthony (1989) reported nesting success of 57 percent in 1980 and 50 percent in 1981 in their study, also in north central Oregon. Unsuccessful nests were due to desertion, internal collapse (cave-ins), depredations, vehicular traffic, flooding, and livestock trampling (Holmes et al. 2003; Conway et al. 2004). Badgers were the principal cause of depredation of burrowing owl nests (Green and Anthony1989; Holmes et al. 2003).

Diet

Burrowing owls are opportunistic feeders that prey on a wide variety of vertebrate and invertebrate species. Invertebrate prey predominates in the summer while vertebrate prey comprises the majority of the winter and spring diet (Green and Anthony 1989; Klute et al. 2003; Nordstrom 2004). Grasshoppers, crickets, and beetles are the most important invertebrate prey groups in three studies of burrowing owl diets in Idaho, Oregon, and Washington (Green and Anthony 1989; Green et al. 1993; Moulton et al. 2005). Rodents were the predominant vertebrate prey group; other vertebrate items include lagomorphs, birds, reptiles and amphibians (Green and Anthony 1989; Green et al. 1993; Moulton et al. 2005).

While invertebrates comprise the vast majority of prey items by number, they comprise a small minority of the biomass due to the small size of each individual prey item. Moulton et al. (2005) reported that invertebrates comprised 93 percent of the prey items, but only 23 percent of the biomass. The results reported by Green et al. (1993) were similar, with invertebrates making up 90.4 percent of the prey items but only 12.7 percent of the biomass. Green and Anthony (1989) reported nearly identical results, with invertebrates comprising 92 percent of prey numbers, but only 22 percent of the biomass.

Range and Distribution

Burrowing owls were originally distributed across much of western North America, from south-central British Columbia through south-eastern Alberta and southern Saskatchewan, south through the Great Plains into northern Mexico, west to Baja, and north through parts of California, eastern Oregon, and eastern Washington (Nordstrom 2004). Their current distribution is considerably reduced. Burrowing owls are extirpated from British Columbia and Manitoba, and they have largely disappeared from significant portions of their former range in the Great Plains (Nordstrom 2004). Burrowing owls have been re-introduced to British Columbia (WDFW 2012).

Eastern Washington represents the northwestern edge of the burrowing owl breeding distribution in the United States (Haug and Oliphant, 1990; Haug et al. 1993; Nordstrom 2004; WDFW 2012). In eastern Washington, burrowing owls are generally found in shrub-steppe and grassland habitats (Smith et al. 1997; Nordstrom 2004; WDFW 2012).

Burrowing owls that nest in southern Canada and the northern United States are migratory. Most winter in the southern United States, Mexico, and Central America (Nordstrom 2004). Data from burrowing owls fitted with geolocators captured in the Pasco area indicated that most wintered in Central or Southern California (WDFW 2012). However, a significant number of banded adults wintered near their nesting burrows in the Columbia Basin (Conway et al. 2004; WDFW 2012).

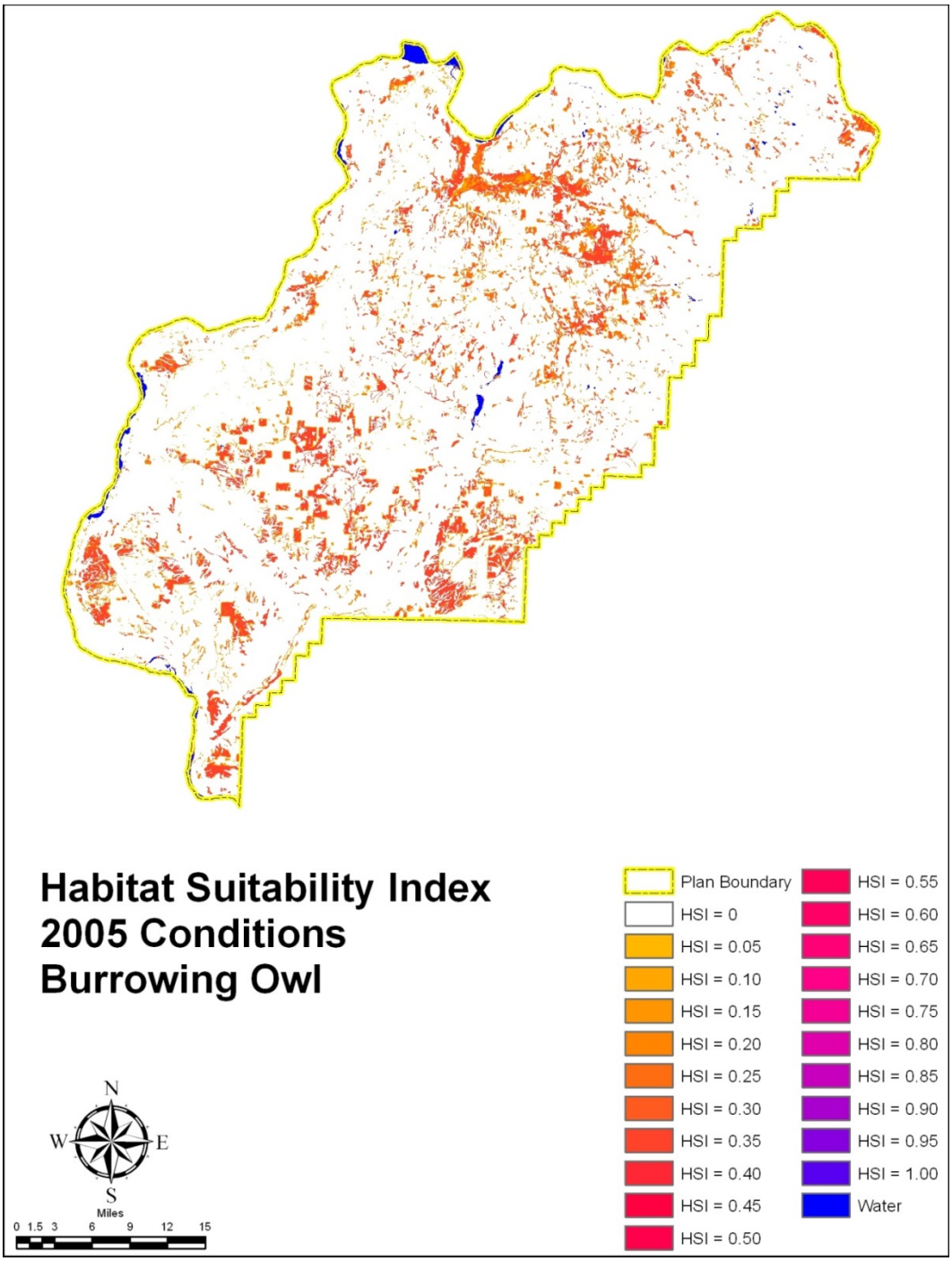


Figure J-1: Habitat Suitability Index 2005 Conditions, Burrowing Owl

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Douglas County Distribution

Currently, burrowing owls are uncommon or rare outside of Benton, Grant, Franklin, and western Adams Counties. In Douglas County, very few nesting burrowing owls have been documented since 2000. Nesting sites have been located in north-central and southern parts of the county (WDFW 2012). Figure J-1 displays the Habitat Suitability for the burrowing owl in the county.

Population Status

In Washington State, burrowing owls were historically distributed across most of the non-forested areas east of the Cascade Mountains, but this distribution has significantly contracted over the past few decades (WDFW 2012). There was an estimated 45 percent decline in the burrowing owl population in Washington State between 1968 and 2005 (WDFW 2012). Causes of population declines include habitat loss and degradation, declines of fossorial mammal populations, loss of prey populations due to use of insecticides and rodenticides, and the direct toxic effects of insecticides and rodenticides on burrowing owls themselves (Sheffield 1997; Dechant et al. 1999; Klute et al. 2003; Nordstrom 2004).

White-Tailed Jackrabbit (*Lepus townsendi*)
Status: No Federal Status, State Candidate

The White-tailed Jackrabbit is a member of the Lagamorph family, along with hares, rabbits, and pikas (Ingles 1965). It is an ecologically important species because of its impacts on habitats and because it is prey for a number of predators (WDFW 2012).

Physical Description

White-tailed jackrabbits are large hares of shrub-steppe habitats. Pelage is grayish brown on upperparts and white to pale gray underneath (Lim 1987). In the northern extent of the range, and in the mountains, individuals have pale gray to white pelage in winter (Lim 1987). The tail remains white throughout the year; ears are tipped with black (Ingles 1965). Body length ranges from 58.9 to 65.5 centimeters (23.2 to 25.8 inches); ear length ranges from 10.0 to 11.3 centimeters (3.9 to 4.4 inches); tail length ranges from 6.6 to 10.2 centimeters (2.6 to 4.0 inches); and body mass ranges from 2.5 to 4.3 kilograms (5.3 to 9.5 lbs.). (All measurements from Lim {1987}). Females are slightly larger than males, and populations in the northern extent of the range are larger than those in southern areas (Ingles 1965; Lim 1987). Individuals are able to run at speeds up to 64 kilometers/hour (40 miles/hour) and clear 5.2 meters (17 ft.) in a single jump (Lim 1987).

Habitat Requirements

White-tailed jackrabbits inhabit shrub-steppe and grassland habitats, including areas with bunchgrass and rabbitbrush, open, low sagebrush, grassland basin and scabland, shrub-steppe, and shrubland basin (Washington Wildlife Habitat Connectivity Working Group 2012).

Reproduction

White-tailed jackrabbits breed from late-February through mid-summer, and multiple litters are common over much of its range (Lim 1987). In one study, the average number of young produced annually was 15 (WDFW 2012). White-tailed jackrabbits are precocial; they are born with eyes open and fully furred (Lim 1987).

Diet

White-tailed jackrabbits are herbivorous; their diet varies seasonally depending upon location and on food availability. A wide variety of plants are consumed, including sagebrush, creambush, clover, dandelion, dryland sedge, Indian paintbrush, goosefoot, fringed sage, and winterfat (Bear and Hanson 1966; Lim 1987). In southern Colorado, Bear and Hanson (1966) reported the summer diet as 70 percent forbs, 19 percent grasses, and seven percent shrubs; clover, dandelion, dryland sedge, and Indian paintbrush comprised 60 percent of the diet. They

reported the average winter diet in southern Colorado as 76 percent shrubs and 12 percent forbs; rabbitbrush was the most common shrub eaten. White-tailed jackrabbits may also consume cultivated crops, including alfalfa and winter wheat (Lim 19987; Washington Wildlife Habitat Connectivity Working Group 2012).

Predation

The most significant predators of white-tailed jackrabbits in Washington include coyotes, bobcats, and eagles. Vehicle traffic, shooting, and domestic dogs also cause considerable mortality (WDFW 2012).

Range and Distribution

White-tailed jackrabbit populations occur from the southern portions of the Prairie Provinces in Canada to northern New Mexico, and from east of the Cascade Mountains to Wisconsin and south through the Great Plains. Two subspecies are recognized: *L. t. campanius,* which is found east of the Continental Divide and *L. t. townsendii,* which occurs to the west (Lim 1987). Range retraction and expansion for both subspecies has occurred with the alteration of habitat by human settlement. Populations are found at a wide range of elevations, from low-lying areas near the Columbia River to alpine areas (Lim 1987). In many areas of its range, populations of white-tailed jackrabbits are in decline (WDFW 2012). Causes of reduced distribution and population numbers include habitat loss and fragmentation, unregulated hunting, competition with black-

tailed jackrabbits (Lepus californicus), and overgrazing (Williams 1986; Lim 1987; WDFW 2012; Washington Wildlife Habitat Connectivity Working Group 2012).

In Washington, the population of white-tailed jackrabbits has been in long-term decline, apparently since shrub-steppe and grassland habitats were converted on a large scale to agricultural uses in the late 1800s (Williams 1986; Lim 1987; WDFW 2012; Washington Wildlife Habitat Connectivity Working Group 2012). Documented sightings of white-tailed jackrabbits are widely scattered across shrub-steppe and grassland habitats of eastern Washington, but are concentrated in two counties—Lincoln and Douglas (Washington Wildlife Habitat Connectivity Working Group 2012). In eastern Washington, white-tailed jackrabbit are often found on arid, hilly bunchgrass sites in summer and in lower sagebrush valleys during winter (Dalquest, 1948).

Douglas County Distribution

Documented sightings of white-tailed jackrabbits extend across most of Douglas County; sightings are most numerous in Eastern and Southern parts of the County (Washington Wildlife Habitat Connectivity Working Group 2012). Within Douglas County, the white-tailed jackrabbit may occur throughout the County, although it is less likely in areas dominated by large expanses of dryland crops. Figure J-2 displays the Habitat Suitability for potential habitats in Douglas County.

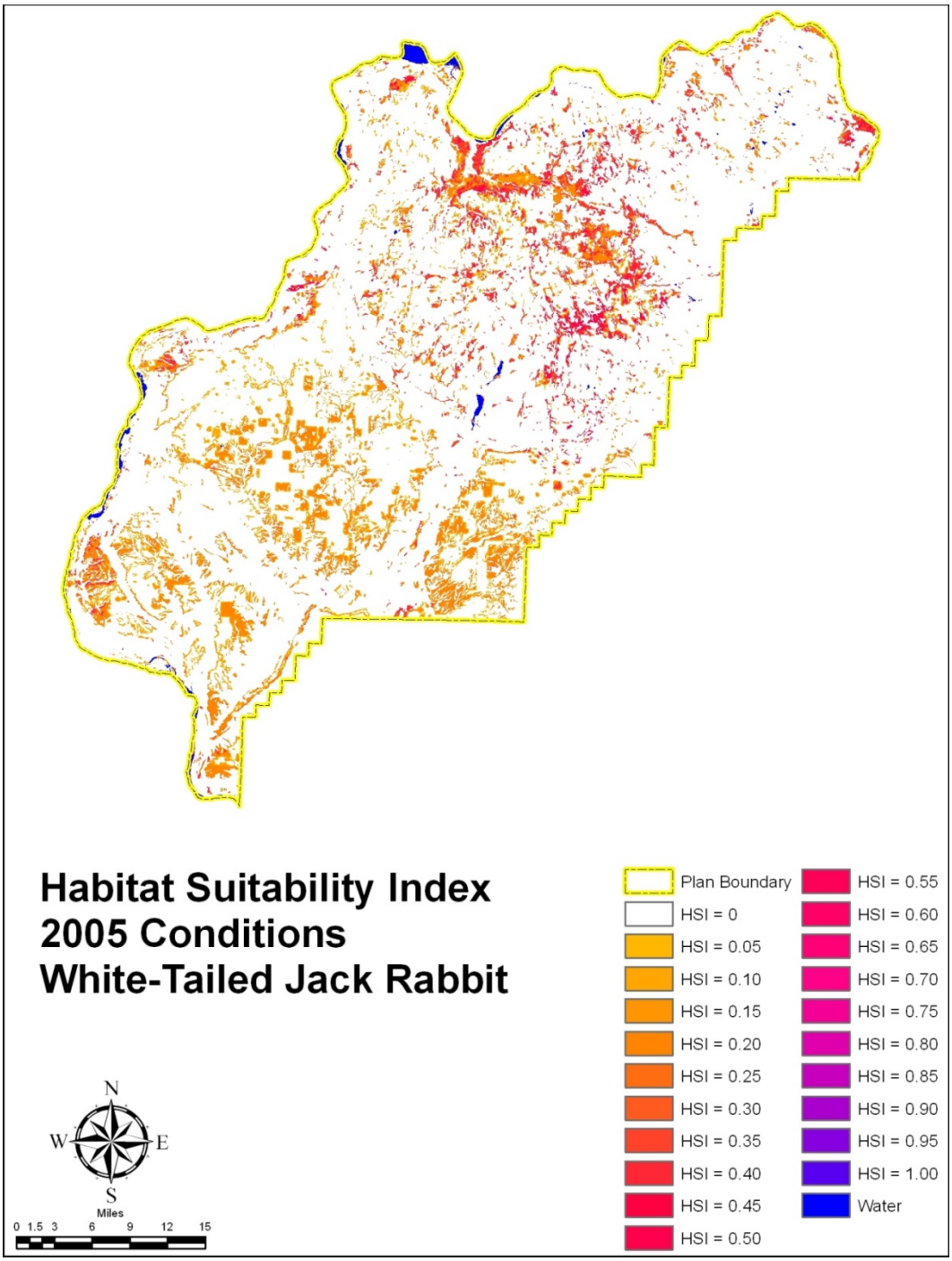


Figure J-2: Habitat Suitability Index 2005 Conditions, White-Tailed Jack Rabbit

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Bald Eagle (*Haliaeeus leucocephalus*)
Status: Federal Species of Concern (De-Listed 2007), State Sensitive

The bald eagle is a large bird of prey found across much of North America from northern Alaska and Canada to Central Mexico (Stinson et al. 2007). It is one of the most recognizable birds and is the national bird of the United States.

Physical Description

The plumage of an adult bald eagle is overall dark brown with a white head and tail. The tail is moderately long and slightly wedge-shaped. Males and females are identical in plumage coloration. However, females display reverse sexual dimorphism and are larger than males. The beak, feet, and eyes are bright yellow. Legs are un-feathered, and toes are short and powerful with long talons. The beak is large and hooked, with a yellow cere (Terres 1980; Alsop 2001; Stinson et al. 2007

The plumage of the immature bald eagles displays various patterns of brown, light brown, white, and whitish gray on the body and wing feathers. Juveniles lack the white head and tail of adults. Immature bald eagles are distinguishable from the golden eagle in that the former has a more protruding head with a larger bill and straighter-edged wings which are held flat (not slightly raised). Bald eagles have a stiffer wing beat and feathers that do not completely cover the legs. In addition, the immature bald eagle has more light feathers in the upper arm area, especially around the very top of the arm (Terres 1980; Alsop 2001; Stinson et al. 2007).

Body length ranges from 71 to 96 cm (28 to 38 inches). Adult females have a wingspan of up to 2.44 m (88 inches), while adult males may be as small as 1.68 m (66 inches). Adult females can weigh up to 5.8 kg (15 lb.), while males can weigh as little as 4.1 kg (5 lb.) (Terres 1980; Alsop 2001; Stinson et al. 2007).

Habitat Requirements

Bald eagles have four specific habitat requirements, three of which require the presence of large, mature trees. These four habitats are nesting habitat, perch trees, foraging habitat, and roosting habitat (Stinson et al. 2001).

Nesting Habitat

Bald eagles normally build their large nests in dominant or super-dominant trees, both live and dead, located near open water. Nearly all (99 percent) of bald eagle nests in Washington are within one mile of open water, and 97 percent are within 3,000 feet (Stinson et al. 2001). In Western Washington, eagles most often use old-growth Douglas-fir, Sitka spruce, grand fir, and

black cottonwood, while ponderosa pine and black cottonwood are often used in Eastern Washington (Stinson et al. 2001).

Perch Trees

Both live and dead trees are used for perch trees, which should be distributed throughout their nesting territories. In fact, dead trees may be preferred because they provide a relatively unobstructed view and open flight paths (Stinson et al. 2001). Bald eagles utilized big leaf maples, black cottonwood, and Sitka spruce in Western Washington. Perch trees can also be used for night roosts (Stinson et al. 2001).

Foraging Habitat

Bald eagles are opportunistic foragers, but rely on fish and waterfowl for the majority of their food, which are most often associated with large water bodies. Such areas include marine shorelines, large rivers, and large lakes or reservoirs (Stinson et al. 2001). Food is the critical habitat feature that draws eagles to wintering areas. In Washington, fall runs of chum salmon provide a major source of food in Puget Sound rivers, such as the Skagit (Stinson et al. 2007). Other important foraging areas are marine beeches and estuaries, large rivers such as the Columbia, and major reservoirs, such as Lake Roosevelt.

Roosting Habitat

Bald eagles require large trees for winter communal roosts in reasonable proximity to foraging areas (Stinson et al. 2001). Birds may roost individually or in aggregates of a few to several hundred, and the same roost may be used year after year (Stinson et al. 2007). Communal roosts provide a microclimate with higher temperatures, lower direct precipitation, and lower wind speeds within roost areas. These improved conditions reduce energy expenditures by up to 10 percent (Stinson et al. 2007). Tree species used for roosts include western red cedar, black cottonwood, western hemlock, and Douglas fir (Stinson et al. 2007).

Nesting

Nesting usually occurs in large, mature trees. Live trees and snags are both used, as long as the tree has the limb structure to support a nest, provides access to adults flying in, and has a good view of the surrounding area (Bent 1937; Johnsgard 1990). Bald eagles make one of the largest stick nests of any bird. Nest cups are lined with soft materials such as grass and feathers (Stinson et al. 2007).

Bald eagles begin nesting at age six, but have known to delay breeding until age seven or eight. In areas where there is less competition for food, young bald eagles may attempt to breed at age four, or even age three (Stinson et al. 2001). Bald eagles mate for life, but engage in annual courtship displays to renew pair bonds. In Washington, courtship displays may begin as early as January and February, and nest repair may begin as early as December (Stinson et al. 2007).

Incubation begins in March and hatching is completed by late April. The number of eggs is usually two (79 percent), but a significant number (17 percent) of pairs only produce one. A clutch of three eggs is rare (4 percent) and four eggs are very rare (Stinson et al. 2007).

Young bald eagles remain in the nest for approximately three months and leave the nest during early to mid-July (Stinson et al. 2001). Juvenile bald eagles suffer significant mortality during their first year as the result of accidents, predation, or starvation (Stinson et al. 2001). Once past their first year, most mortality is human-related, including gunshot, lead poisoning, electrocution, and vehicle collisions (including trains) (Stinson et al. 2001). Inter-specific conflicts may also cause mortalities (Stinson et al. 2001).

Diet

Bald eagles are large, capable predators and opportunistic foragers that feed on a wide variety of prey species. Fish and waterfowl provide the majority of food; however, many other species are included in their diet. Mammal prey includes rabbits, raccoons, muskrats, opossum, and jackrabbits. Bald eagles have been recorded raiding gull and seabird roosts or nesting colonies, while sub-adults have been observed walking through a seabird colony and eating the eggs (Stinson et al. 2007).

Bald eagles are effective scavengers. Besides consuming spawned-out salmon, they will feed on dead animals when available, including beached marine mammals (whales, seals, sea lions, sea otters). In upland areas, bald eagles will scavenge on dead cattle, sheep, deer, or other large mammal carcasses (DellaSala et al. 1989; Stinson et al. 2007)

A study of food items at 33 bald eagle nests in Western Washington recorded 72 percent birds, 16 percent fish, 6 percent mollusks and crustaceans, and 6 percent mammals. Birds included 15 species of waterfowl, including mergansers, gulls, snow geese, loons, western grebe, common murre, great blue heron, cormorant, as well as red-tailed hawk, ring-necked pheasant, and grouse. Mammals included mink, muskrat, and domestic dog (Stinson et al. 2007).

A food study of nesting bald eagles at Lake Roosevelt reported a diet of 83 percent fish, 13 percent birds, and 2 percent mammals (Stinson et al. 2001). Fish included suckers, rainbow trout, kokanee, walleye, black crappie, small-mouthed bass, yellow perch, whitefish, and carp. Birds included coots, ducks, pigeons, and flickers. Another study along the mid-Columbia indicated that most of the prey taken was coots, mallards, and chukars, with fish making up only 8 percent of the prey (Stinson et al. 2007).

Range and Distribution

Historically, bald eagles were common across much of Washington State, particularly in marine areas in Western Washington and along the Columbia River. The historic population is estimated to have numbered approximately 9,000 birds (Stinson et al. 207). The population

declined drastically between the early 1940s and the 1970s due to the widespread use of DDT. In 1975, only three breeding pairs were located along interior lakes or rivers. In a statewide survey conducted by WDFW in 1980, 105 nesting pairs were located (Stinson et al. 2007).

Bald eagle populations began to recover after the ban on DDT was imposed in the 1970s. Between 1981 and 2005, the nesting population increased by over 700 percent, with over 840 breeding pairs recorded during a statewide survey in 2005 (Stinson et al. 2007). Nesting was concentrated in the marine areas of the state and along major rivers, including the Columbia River.

The wintering population of bald eagles may be several times the spring and summer population, due to the arrival of birds from Canada and Alaska, as well as Montana and California. Birds congregate in areas with abundant food supplies, such as spawned-out salmon carcasses or concentrations of waterfowl (Stinson et al. 2007).

Douglas County Distribution

In Douglas County, bald eagle distribution is generally restricted to the western, northern, and northeastern periphery of the county, where the county is bordered by the Columbia River and Banks Lake. No nests were recorded in or near Douglas County during a 1980 survey (Stinson et al. 2001). In 1998, approximately 10 nests were located along the Columbia River and Banks Lake; most were located along the northern periphery of the County (Stinson et al. 2001). In 2005, a similar survey recorded approximately 15 nests along the Columbia River and Banks Lake adjacent to Douglas County (Stinson et al. 2007).

Bald eagle wintering activity along the Columbia River and Banks Lake has also increased over the past 30 years. Approximately 10 feeding and concentration areas were recorded in 2001, while almost 20 communal roosts and concentration areas were located in 2007 (Stinson et al. 2001, 2007). Figure J-3 displays the Habitat Suitability for potential bald eagle habitats across Douglas County.

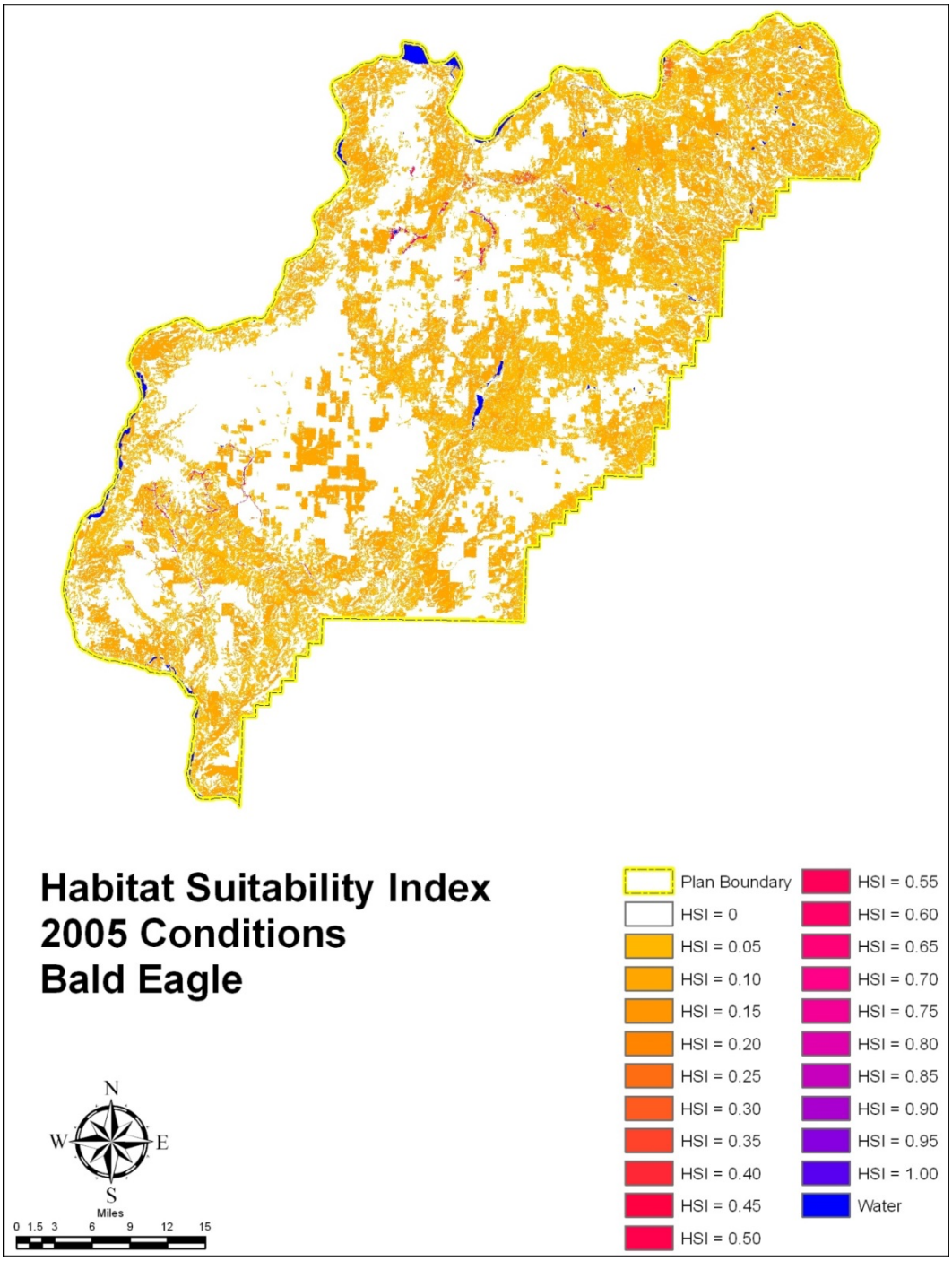


Figure J-3: Habitat Suitability Index 2005 Conditions, Bald Eagle

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Golden Eagle (*Aquila chrysaetos*)

Status: Federal Status-None, State-Candidate

The Golden Eagle is one of the best-known birds of prey in the Northern Hemisphere. Like all eagles, it belongs to the family Accipitridae. Distribution is circumpolar and the species can be found across much of North America, Europe, the Middle East, Asia, and northwestern Africa (Grossman and Hamlet 1964; Snyder and Snyder 1991). Golden eagles are birds of open plains, shrub-steppe and grasslands, and canyons, as well as mountains and northern tundra (Grossman and Hamlet 1964; Olendorff 1975; DeLong et al. 2004).

Physical Description

The golden eagle is a large, mostly dark brown raptor, with a wingspan of 60 to 80 inches (152 to 204 cm), a body length of 30 to 40 inches (76 to 102 cm), and a weight of 6.5 to 13 lb. (4.3 to 5.8 kg). Subtle differences occur among different age classes. Adult birds are identified by their lightly-banded tail and their golden brown neck and head feathers, which they normally acquire at four years of age. Immature birds lack the golden head and neck feathers and have white patches at the base of their flight feathers and the base of the tail, both of which are readily visible in flight. Legs of both adults and juveniles are fully feathered down to the talons (Grossman and Hamlet 1964; Terres 1980; Snyder and Snyder 1991).

Habitat Requirements

Golden eagles require large expanses of open habitat that are cut and broken with canyons, streams, and mountains, such as shrub/steppe, grasslands, desert and semi-arid areas, shrub/grassland, prairie, and tundra (Watson and Whalen 2004; Delong 2004; WDFW 2012). Mountainous regions that include large areas of open habitat, including clear cuts, meadows, and alpine, are also suitable habitat (Brent 1937; Grossman and Hamlet 1964). Golden eagles may also be found in coastal and marine areas, if cliffs and/or large trees for nesting are available (Watson and Whalen 2004; Washington NatureMapping Program 2013).

Nesting

In addition to extensive foraging areas, golden eagles require suitable nesting habitat. Golden eagles place their nests on a variety of structures, including cliffs, large trees, transmission towers, and, in the absence of elevated locations, on the ground (Watson and Whalen 2004; Delong 2004). Large trees utilized included cottonwoods of various species (*Populace* spp.), ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), oak (Quercus spp.), sycamores (*Platanus* spp.), and redwoods (*Sequoia sempervirens*) (Bent 1937; Delong 2004). In Washington, golden eagle nests are generally located on cliffs, but nests are also constructed in large trees (Watson and Whalen 2004).

Diet

A large, powerful raptor, golden eagles are capable of taking a wide range of prey, including reptiles, birds, and mammals. Carrion may also be consumed, particularly in the winter when other food is scarce. In Washington, important prey species include ground squirrels (*Urocitellus* spp.), jackrabbits (*Lepus* spp.), marmots (*Marmota* spp.), mountain beaver (*Aplodontia rufa*), cottontail rabbits (*Sylvilagus nuttalli*), ring-necked pheasants (*Phasianus colchicus*), chukar (*Alectoris chukar*), and rock doves (*Columbia livia*) (Watson and Whalen 2004). Other prey reported includes prairie dogs (*Cynomys* spp.), snowshoe hare (*Lepus americanus*), mink (*Mustela vison*), opossums (*Didelphis*), weasels (*Mustela* spp.), skunks (*Mephitis* spp.), and various rodents (DeLong 2004). Larger mammals, both wild and domestic, have also been reported as prey, including the young of deer, antelope, mountain sheep, goats, and domestic sheep, cattle, pigs, dogs, and cats (Bent 1937). Birds recorded as prey include various waterfowl species, including geese, other raptors, such as goshawks, red-tail hawks, and short-eared owls, gallinaceous birds, including grouse, pheasants, quail, and ptarmigan, crows, and a variety of smaller birds, including curlews, plovers, kingfishers, meadowlarks, and thrushes (Bent 1937).

Range and Distribution

The breeding distribution of the golden eagle extends over much of North America, from northern Alaska and Canada, south through western Canada and the U.S. into Central Mexico (Grossman and Hamlet 1964; Terres 1980; DeLong 2004). Golden eagles rarely nest in the southern part of Canada east of central Saskatchewan and in the United States east of the Great Plains, although non-breeding or migrating birds are observed across much of this area, except for the southeastern United States. Golden eagles that nest in Alaska and northern Canada are migratory (Terres 1980; Delong 2004).

In Washington State, golden eagles are most common east of the Cascade Mountains, especially across the north-central portion of the state and the Okanogan Highlands (Watson and Whalen 2004; WDFW 2012; Washington NatureMapping Program 2013). Golden eagles are less common in the Central and Southern Cascades, along the western slopes of the Cascades, and in the Blue Mountains, the San Juan Islands, and the Olympic Peninsula. Migrating or non-nesting birds can occasionally be observed in other areas of the state (Watson and Whalen 2004; WDFW 2012; Washington NatureMapping Program 2013).

Douglas County Range

In Douglas County, golden eagle nesting sites have been documented in Moses Coulee, along the Columbia River, and along Banks Lake on the eastern periphery of the County (WDFW 2001; USBLM 2012; Watson and Davies 2009). Foraging or migrating golden eagles can occasionally be observed across all of Douglas County (Watson and Whalen 2004; Washington NatureMapping Program 2013). Three golden eagles were observed during surveys along the proposed route for the Wells to Rocky Reach transmission line across the western Waterville Plateau (Parametrix,

Inc. 2009). Three golden eagles were captured in Douglas County during surveys for contaminants and lead poisoning; one each in the west-central portion of the county, at Rocky Reach Dam, and along Douglas Creek (Watson and Davies 2009; Stauber et al. 2010). Figure J-4 displays the Habitat Suitability for potential golden eagle habitats in Douglas County.

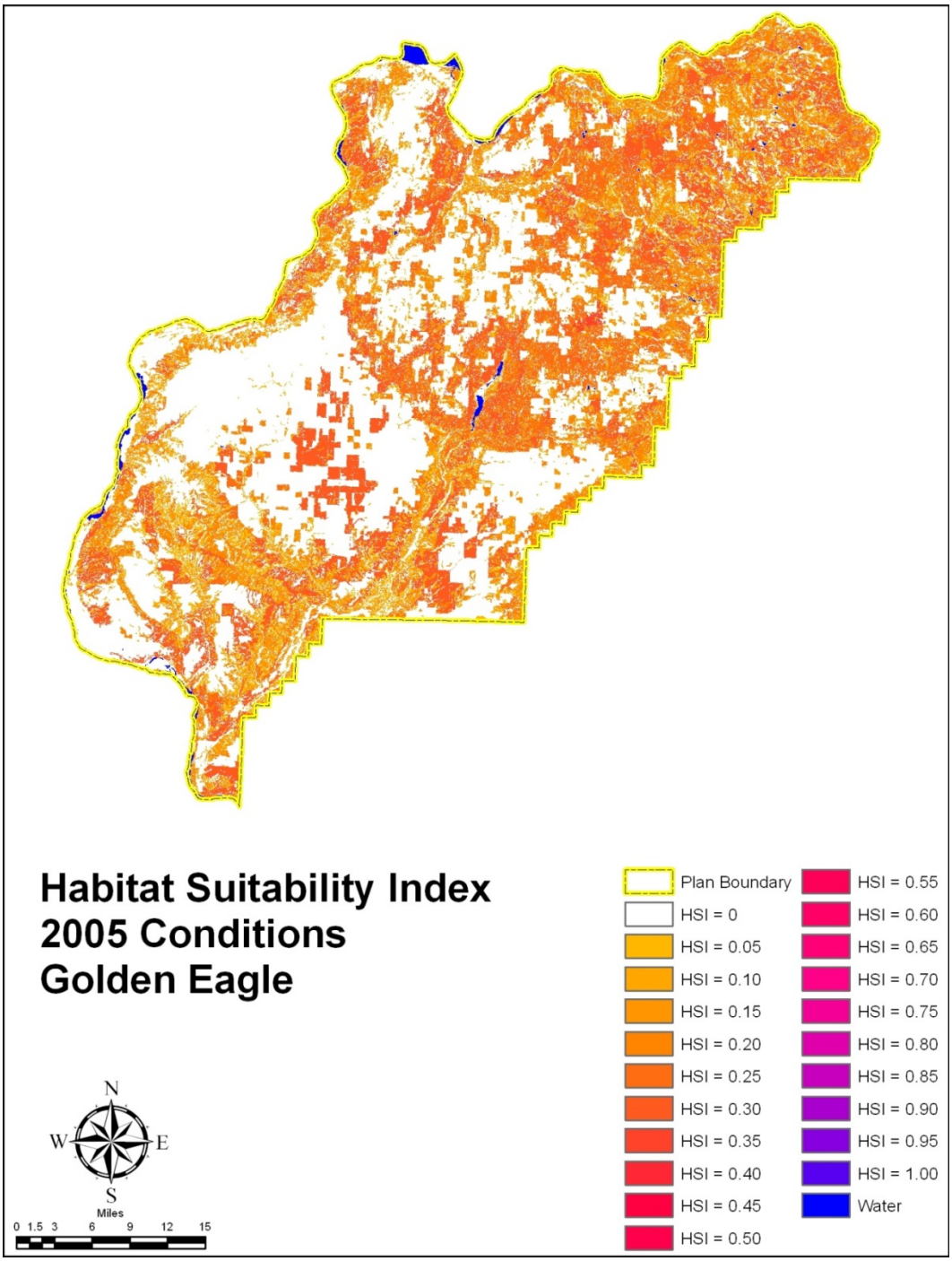


Figure J-4: Habitat Suitability Index 2005 Conditions, Golden Eagle

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Peregrine Falcon (*Falco peregrinus*)
Status: Federal-Species of Concern; State-Sensitive

The Peregrine Falcon is an iconic bird of prey, celebrated in literature and art. Because of its widespread use in falconry, it is a part of cultures across the world. More recently, the peregrine falcon helped alert the world to the dangers of pesticide contamination. After suffering severe population declines across extensive regions of the world, including the United States, the peregrine falcon has experienced significant population recovery over the last 40 years.

Physical Description

The peregrine falcon is a medium to large falcon, with a length of 13 to 23 inches and a weight of 18 to 56 ounces (Grossman and Hamlet 1964; Davis 2008). As is true with most raptor species, peregrine falcons display sexual dimorphism with respect to size and weight, the female being larger (Cade 1982). Male peregrines are approximately one-third smaller than the females, which gave rise to the falconry term "tiercels," which means "third" (Davis 2008).

The sexes are similar in plumage. Adult birds are typically bluish to slate-gray to almost black on upper parts, with light or white chest and throat. The chest and under-parts may be barred and typically have a rufous wash. The head is black with a white or rufous cheek-patch (sometimes indistinct) and white throat. Blackish facial stripes ("malar stripes") extend downward from the eyes across the cheek (Bent 1938; Johnsgard 1990; Hayes and Buchanan 2002; Davis 2008).

Habitat Requirements

Prominent large cliffs with open, sweeping views and relatively close proximity to water are preferred nesting habitat (Cade 1982; Hays and Milner 2004; Luensmann 2010). Cliff areas provide both nesting and perching sites from which to hunt. Peregrines prefer cliff ledges that are inaccessible to mammalian predators, provide protection from the weather, have adequate substrate for the nest and young, and are free from human disturbance. Cliffs in excess of 100-150 feet in height are often selected as nest sites, when available (Hays and Milner 2004; Luensmann 2010). Nest sites in the Columbia Basin of Washington are not well described, but have been located on cliff faces between 666 to 1,865 feet elevation (Hayes and Buchanan 2002). Nest sites in Washington are generally within 200 feet of a permanent body of water, likely because it provides a plentiful source of prey (Hayes and Buchanan 2002).

Alternative nesting sites, such as tall trees or buildings or bridges in urban areas, have the same general characteristics as cliffs—broad, commanding views, close proximity to bodies of water, suitable substrate, and protection from weather, mammalian predators, and human disturbance. Regardless of the exact nesting location, it must be close enough to foraging areas to provide sufficient prey base for successful reproduction.

In winter, peregrines use expansive open areas, including seacoasts, estuaries, beaches, tidal areas, agricultural areas, and valleys and cliffs along large rivers, lakes and reservoirs. Appropriate perching and roosting sites near these wintering areas are important winter habitat features. Perches commonly used by peregrines include trees, snags, pilings, fence posts, navigation towers, driftwood logs, coastal bluffs, cliffs, and utility poles. They also use a variety of man-made structures, including ship masts, industrial cranes, buildings, large bridges, grain elevators, and water towers (Hayes and Buchanan 2002). Many of the perching sites may be used as roosting sites if they provide protection from inclement weather.

Nesting

Female peregrine falcons generally do not reach sexual maturity until two years of age, although some will breed as yearlings, while others may not breed until age four. Males mature later and often are not recruited into the breeding population until three to five years of age (Hayes and Buchanan 2002; Davis 2008). Breeding pairs of yearling birds are rarely successful. Courtship behavior may commence in the fall and continue through the winter, but courtship is most noticeable and frequent in late winter (Hayes and Buchanan 2002).

Breeding peregrines often return to the same nesting territory every year, although they may change specific nesting locations from year to year (Davis 2008). Peregrines do not construct a nest in the conventional sense. They simply form a shallow depression or "scrape" in the soil, decaying vegetation, or loose rock or gravel on the ledge or other nesting location (Hayes and Buchanan 2002). The classic peregrine nest, or "eyrie," is placed high on a cliff ledge overlooking the seacoast, a large river, or lake. However, peregrines nest in a wide variety of venues, including cut banks along rivers, steep slopes, and mounds in tundra, sand dunes, or low-lying bog (Cade 1982). Peregrines also nest in large tree cavities and may occupy old stick nests built by ravens, eagles, osprey, heron, or other large bird in trees or on cliffs (Cade 1982).

In addition to natural nesting sites, peregrines nest on a variety of manmade structures, including tall buildings (skyscrapers, cathedrals, and castles), ruins, water towers, power plant stacks, bridges, overpasses, loading cranes, silos, and nesting boxes made specifically for this species (Cade 1982; Davis 2008; Luensmann 2010). Peregrines have also nested in quarries and in iron mines (Luensmann 2010).

In Eastern Washington, egg laying is estimated to occur from early May to early June, and hatching from early June to early July (Hayes and Buchanan 2002). Peregrines lay one clutch per year, usually with three to four eggs. However, clutch size may vary from two to as many as seven (Bent 1938; Hayes and Buchanan 2002). Females may lay a replacement clutch if the first one is destroyed prior to the 10th day of incubation (Hayes and Buchanan 2002). Clutch size may be influenced by the age of the female; younger birds lay fewer eggs (Hayes and Buchanan 2002). Both sexes may incubate the eggs, but the female normally incubates during the night (Davis 2008).

Incubation typically begins with the laying of the penultimate egg and the incubation period is 32-35 days (Davis 2008). After hatching, chicks depend upon the parents for food and care. Chicks lack thermoregulatory ability and are almost continuously brooded until 10 days of age. Brooding activity gradually declines and ceases altogether when chicks reach 20 days old. Both parents feed the young, but in the early nestling stages, most care is provided by the female. Fledging occurs at 37 to 45 days post-hatch, but the young continue to depend on the parents for food for one to three months after leaving the nest (Davis 2008).

Diet

Although peregrines are large, agile fliers, capable of taking a wide variety of prey, they are considered specialists in the pursuit and capture of birds. Indeed, birds make up the majority of food consumed, sometimes comprising 100 percent of their diet (Hayes and Buchanan 2002). However, they are generalist in the sense that they are can and do prey on a wide size range of birds, and, to a lesser extent, mammals. Prey captured by peregrine falcons typically weighs from 2 to 18 ounces, but much larger prey, exceeding four pounds, is taken (Luensmann 2010).

Peregrines often hunt by perching at a location that provides an open, commanding view of the surrounding area, such as on tall trees, cliffs, or tall buildings (still hunting). When prey is selected, the falcon flies out at a higher altitude and, when in a favorable position, carries out a classic high-speed "stoop" which results in the prey being struck in mid- air and either killed or injured. Stoops may begin at altitudes of 5,000 feet and peregrines may reach speeds of 250 miles per hour during the dive (Luensmann 2012). Small prey is normally carried to a favored perch where it is consumed, while large prey may be eaten where it falls or cut into pieces and then carried to a favored perch (Cade 1982; Hayes and Buchanan 2002; Luensmann 2010).

In a variation of still hunting, a perched peregrine may go after highflying birds in a tactic known as "ringing-up." After selecting a target, the peregrine takes off and gains altitude as quickly as possible, in order to obtain a position above the prey. The peregrine then engages in a series of short stoops or tail chases until the prey is captured (Cade 1982; Davis 2008).

Peregrines also search for prey while circling or soaring high in the sky, in a technique known as "waiting on." From this vantage point, a hunting bird can either attack a lower target by diving in a stoop or pursue a bird at a higher altitude by ringing up (Cade 1982; Hayes and Buchanan 2002).

If the peregrine is going after prey located on the ground or low-flying birds, it may fly at low altitude, just skimming over the landscape, and use hedges, trees, sand dunes, even ocean waves, to mask its approach. This is called "contour hugging," and is commonly used to surprise shorebirds and waterfowl on the water surface (Cade 1982; Hayes and Buchanan 2002; Luensmann 2010).

In North America, peregrines have been documented preying on 429 bird species, 10 bat species, 13 other mammal species, 4 fish species, and insects, mostly Orthoptera and Odonata. Prey ranges in size from small passerines, shrews (*Soricidae*), and voles (*Microtus* spp.), to large waterfowl, owls, turkeys, vultures, and snowshoe hares (*Lepus americanus*) (Luensmann 2010).

Where present, rock doves, mourning doves, and European starlings are important prey species in Washington (Hayes and Buchanan 2002). In coastal and marine areas and along large rivers and reservoirs, waterfowl, shorebirds, and other sea birds (gulls, murres) are important prey items. Other species of birds taken include robin, cedar waxwing, savannah sparrow, and northwestern crow. In winter, peregrines hunt primarily near marine areas, estuaries, marshes, large rivers, and lakes and reservoirs. Waterfowl, shorebirds, and seabirds are important prey items, along with rock doves, northern flickers, meadowlarks, red-winged blackbirds, blue jay, and some passerines (Hayes and Buchanan 2002).

Both adult and recently-fledged young have been observed catching insects in flight, including, butterflies, beetles, salmonflies, locusts, Mormon crickets, grasshoppers, cicadas, and dragonflies (Cade 1982; Ellis et al. 2007; Davis 2008). Pursuing insects appears to be a way for young peregrines just out of the nest to hone their hunting skills (Ellis et al. 2007).

Range and Distribution

The peregrine falcon is a cosmopolitan species and has one of the widest distributions of any bird, equaled only by the osprey, the common raven, and the barn owl. It can be found throughout North America, along the western coast of Greenland, in Central and South America (except for the Amazon Basin), throughout most of Asia (except for Tibet and Mongolia), in Australia and most of the Pacific Islands, across almost all of Europe, in sub-Saharan Africa (except for the south-central portion, the north-western coast, and Nile Valley), and in the coastal areas of the Arabian Peninsula (Bent 1938; Grossman and Hamlet 1968; Davis 2008). Peregrines that nest in the Canadian and Alaskan arctic migrate to Argentina and Chile, a distance of over 9,000 miles (Cade 1982; Davis 2008).

In Washington, peregrine falcon distribution is complicated by the presence of three sub-species: American (*F.p. anatum*), Peale's (*F.p. pealei*), and arctic (*F.p. tundrius*). Nesting of *F.p. pealei* is limited to coastal areas of the Olympic Peninsula, north of Grays Harbor. Nesting of *F.p. anatum* is concentrated in the San Juan Islands, as well as in the Columbia Gorge. Nesting also occurs at scattered locations on both the western and eastern slopes of the Cascade Mountains, along Banks and Sun Lakes and along the Snake River in southeastern Washington (Hayes and Buchanan 2002; WDFW 2012).

In winter, both *F.p. anatum* and *F.p. pealei* can be observed along coastal and marine areas from the Columbia River Estuary north to the Canadian border. Peregrines also winter in the Columbia River Gorge, but are rare across Eastern Washington during this time of year. *F.p. tundrius*

normally passes through Washington as a migrant, but individuals may occasionally spend the winter in the State (Hayes and Buchanan 2002).

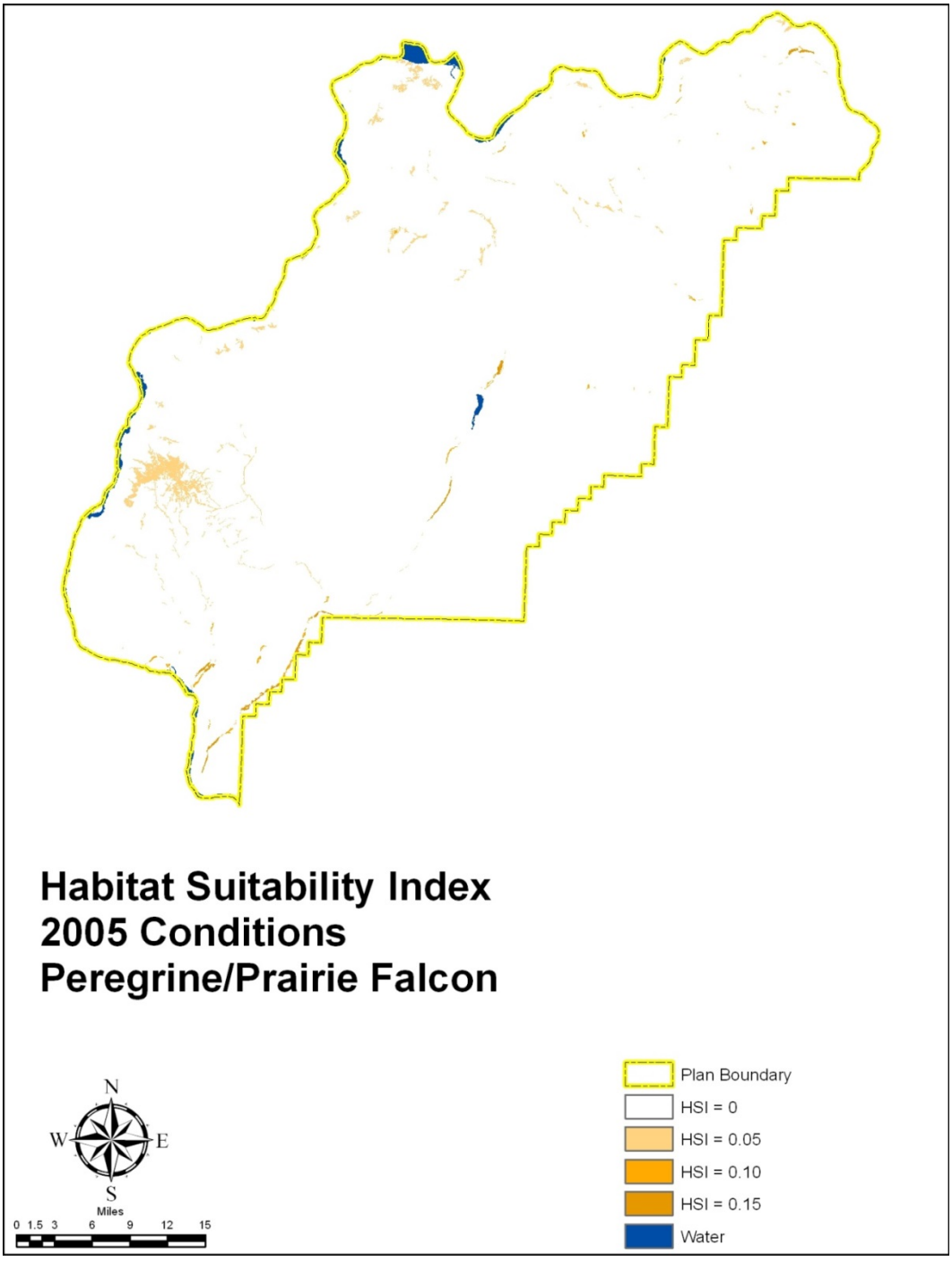


Figure J-5: Habitat Suitability Index 2005 Conditions, Peregrine Falcon/Prairie Falcon

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Douglas County Range

In 2002, five locations on the eastern border of Douglas County were known to have nesting peregrine falcons. Most of these sites were located in the basalt cliffs overlooking Banks Lake (Hayes and Buchanan 2002; USFWS 2003b; USFWS 2010). Currently, this number may be slightly higher (WDFW 2012). In recent years, nesting peregrine falcons have also been observed at Jamison Lake and Barker Canyon (WDFW 2012).

Peregrine falcons are rare in Douglas County during winter (Hayes and Buchanan 2002). Four Audubon Christmas Bird Count (CBC) circles include portions of Douglas County, three (Bridgeport, Chelan, and Wenatchee) are located along the Columbia River. The fourth is located at Steamboat Rock State Park on Banks Lake. Since 2000, peregrine falcons have been occasionally recorded during these CBCs. The Chelan CBC recorded one peregrine falcon in 2001, one in 2007, and one in 2009, while the Bridgeport CBC recorded one peregrine in 2002. The Wenatchee CBC recorded one peregrine in 2003 and 2 in 20008. Historical Audubon CBCs may be accessed at http://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx#. Figure J-5 displays the Habitat Suitability Index for potential habitats in Douglas County (see previous page).

Population Status

The peregrine falcon is perhaps the most studied bird in the world (Davis 2008). Much has been written about population collapses, particularly in Europe and North America, due to the wide-spread use of organochlorine pesticides, especially DDT, in the 1950s and 60s. DDT and its metabolite, DDE, as well as other organochlorine pesticides (aldrin, dieldrin, and heptachlor) accumulate in the food chain. These contaminants reached such high concentrations in peregrine falcons that they interfered with the formulation of eggshells, resulting in much reduced reproductive success (Cade 1982; Hayes and Buchanan 2002; Mora et al. 2002; Loensmann 2010).

Due to widespread reproductive failure beginning in the early 1950s, peregrine populations in North America and Europe entered a period of severe decline that extended to the mid-1970s (Cade 1982; Hayes Buchanan 2002; Davis 2008). Peregrines were extirpated from the Eastern United States, and were much reduced across the West by the mid-1960s (Luensmann 2010). In the Northwest, 80 to 90 percent of the nesting sites were vacant by that time (Hayes and Buchanan 2002).

The historic population of peregrines in Washington is not known, due to the lack of reliable, comprehensive surveys prior to the early 1980s. Some estimates place the number at several dozen breeding pairs, but this probably understates the historical population (Hayes and Buchanan 2002). As with other North American populations, peregrine populations in Washington went through a period of steep decline. Surveys and reports in the 1970s and 1980s indicate that the breeding population had been reduced to less than 10 pairs by the mid-1970s (Hayes and Buchanan 2002).

After DDT was banned in 1972, peregrine populations began a slow recovery (Cade 1982). The estimated population of breeding pairs in North America at the start of the 21st century was 8,000-10,000, which compares favorably with pre-DDT population estimates (Davis 2008). In Washington, occupied breeding territories increased from 5 in 1980 to 72 in 2000, which included a number of nesting territories in Eastern Washington (Hayes and Buchanan). The most recent comprehensive peregrine survey in 2009 documented 110 occupied nesting territories in Washington (James Watson personnel communication 5 Dec 13).

Predation

After fledging, peregrines have few predators. The great-horned owl is perhaps the most significant, but adults may also be taken by golden eagles and gyrfalcons (Hayes and Buchanan 2002; Luensmann 2010). Prior to fledging, young peregrines may be taken by adult peregrines, great-horned owls, and red-tailed hawks. Mammals that have been recorded preying on juvenile peregrines include red fox, grey wolf, grey fox, wolverines, short-tailed weasels, bobcats, raccoons, and coyotes (Hayes and Buchanan 2002; Luensmann 2010).

Prairie Falcon (*Falco mexicanus*)
Status: Federal Status-None; State-Monitor

Though similar in size to the peregrine falcon, the prairie falcon's range is limited to open areas in Western North America, such as plains, deserts, shrub-steppe, and open agricultural areas.

Physical Description

The prairie falcon is a medium to large falcon of western North America, with a length of 14 to 19 inches and a weight of 15 to 43 ounces (Alsop 2001; Davis 2008). Like peregrine falcon, prairie falcons display sexual dimorphism with respect to size and weight, the female being larger (Cade 1982). Male prairie falcons are approximately one-third smaller than the females, which gave rise to the falconry term "tiercels," which means "third" (Davis 2008).

In general, prairie falcons have light underparts and darker upperparts. The upperparts are light brown, tan, or tawny, with darker barred markings. The underparts are creamy-white with brown streaking. The underwings have a dark triangular marking in the axillary region. White eye lines may wrap around the back of the head, creating a brown crown on the top of the head. Pale brown malar strips extend down from the eyes. The eyes are large; the prairie falcon has the largest eyes in proportion to its head of any falcon. Sexes are similar in plumage. Juveniles are

similar to adults with the exception that they have heavier streaking and may have underparts with less white and more buff or a reddish wash (Terres 1980; Cade 1982; Davis 2008).

Habitat Requirements

Prairie falcons inhabit plains, grasslands, deserts, shrub-steppe, open agricultural areas, alpine grasslands and shrub-steppe, shortgrass prairies, xeric scrub grassland, open woodland, foothills, and mountains of the Interior West, provided that such areas have cliffs and escarpments for nesting (Cade 1982; Evans 1982; Tesky 1994; Delong and Steenhof 2004). Although nesting has been documented at over 12,000 feet, prairie falcons normally nest at elevations below 10,000 feet (Evans 1982; Tesky 1994).

Foraging habitat is typically the open, treeless habitats itemized above. These areas accommodate the swift, low-level style of hunting preferred by prairie falcons (Evans 1982) and support populations of ground squirrels and passerine birds that are their favored prey (Delong and Steenhof 2004). After the nesting season, prairie falcons disperse to areas of the Great Plains, as well as the inter-mountain valleys of the West. These are typical wintering areas as well (Evans 1982).

Nesting

Prairie falcons almost always nest on cliffs and escarpments, including canyon walls, butts, rock outcrops, ridges, cave walls, and mine highwalls (DeLong and Steenhof 2004). Occasionally, prairie falcons will nest in the abandoned nests of ravens, golden eagles, and red-tailed hawks located on cliffs or transmission towers or in trees (Cooper and Beauchesne 2004; DeLong and Steenhof 2004).

Prairie falcons may begin breeding when one year old, but most do not breed until age two (Evans 1982; Tesky 1994). Breeding behavior begins in late February and March, with egg-laying beginning in late March (Bent 1938; DeLong and Steenhof 2004). Clutches of four or five eggs are typical, with three being less common, and six very rare (Evans 1982; Tesky 1994; Davis 2008). If the clutch is destroyed early in the breeding cycle, prairie falcons may re-nest (Evans 1982; DeLong and Steenhof 2004). The female does most of the incubating, which lasts 29-33 days (Evans 1982; Davis 2008). The young fledge in 30-41 days (Evans 1982; Davis 2008). The period of post-fledging parental care is relatively short, and the young disperse at about 65 days of age (Evans 1982).

Diet

Prairie falcons prey extensively on various species of ground squirrels (Evans 1982). In southern Idaho, their breeding schedule is closely correlated with that of local ground squirrel populations (Cade 1982; Johnsgard 1990). Breeding activities begin about the time ground squirrel hibernation is ending, with juvenile dispersal occurring in concert with ground squirrels entering aestivation in mid-summer (Cade 1982; Evans 1982). The principal species taken in southern Idaho is Townsend's ground squirrel (*Urocitellus townsendii*). In Wyoming and Alberta, the

most common prey species was Richardson's ground squirrels (*Urocitellus richardsonii*) (DeLong and Steenhof 2004), while Richardson's ground squirrels (*Urocitellus richardsonii*) and horned larks were the predominate prey in another study in Wyoming (Johnsgard 1990). In northwestern South Dakota, thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*) were one of the primary prey species (DeLong and Steenhof 2004). In northern California, Belding's ground squirrel (*Urocitellus beldinge*) was the primary prey species (DeLong and Steenhof 2004). In Arizona, thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*) and Harris's antelope squirrels were the predominate prey, followed by lagomorphs and Gambel's quail (Johnsgard 1990).

Other prey taken during the breeding season includes passerine birds, white-tailed prairie dogs, rabbits, meadowlarks, rock doves, horned larks, and starlings (DeLong and Steenhof 2004). In areas lacking ground squirrels, small to medium-sized birds and lizards predominate (Evans 1982). In Utah, black-tailed jackrabbits (*Lepus californicus*) provided 65 percent of the biomass (Johnsgard 1990). Recently fledged young may concentrate on insects (grasshoppers, beetles) and reptiles, which are less difficult to capture (Evans 1982).

Horned larks are an important prey species during the winter (Evans 1982; Tesky 1994). Other prey taken in various seasons includes pocket gophers (*Geomys* spp.), cottontail rabbits (*Sylvilagus* spp.), jackrabbits (*Lepus* spp.), pikas (*Ochotona princeps*), wood rats (*Neotoma* spp.), mountain bluebirds, northern flickers, sage thrashers, shrikes (*Lanius* spp.), rock doves, magpies, longspurs, and lark buntings (Tesky 1994).

Distribution and Range

The breeding range of the prairie falcon covers the Interior West from south-central British Columbia (Okanogan Valley) and southern Alberta and Saskatchewan, south to northern Mexico and Baja. The eastern limit of the breeding range is western North and South Dakota and West Texas (DeLong and Steenhof 2004). Most prairie falcons winter in the general area of their nesting territories, but birds that nest in the northern parts of their range and at higher elevations are migratory. During the non-breeding season, prairie falcons move out across the Great Plains, further south into Central Mexico and southern Baja, Western Washington and Oregon, and Northern Idaho (DeLong and Steenhof 2004).

In Washington, prairie falcons are found across the Columbia Basin and on the eastern slopes of the Cascade Mountains and Okanogan Highlands. They do not occupy the Blue Mountains. They have been documented in every county in Eastern Washington except Pend Oreille (Hays and Dobler 2004). In winter, they can be found across most of their breeding range, but the largest concentrations can be found in the Central Columbia Basin (Adams, Benton, Franklin, Grant, and Walla Walla counties) (Hays and Dobler 2004). Wintering prairie falcons are occasionally reported in Western Washington and appear in Christmas Bird Counts and the

Skagit Flats Winter Hawk Count (http://www.frg.org/S_Flats.htm). Historical Audubon CBCs may be accessed at http://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx#.

Douglas County Range

Prairie falcons are permanent residents in Douglas County and, although not abundant, they can potentially be observed across the entire county. Any area of expansive cliffs may provide suitable nesting sites, including the cliffs in Moses Coulee and along the eastern periphery of the county from Grand Coulee south to Lake Lenore, the cliffs along Douglas and Rock Island Creeks, and the cliffs and escarpments bordering the Columbia River. The shrub-steppe, rangelands, and agricultural areas of the Waterville Plateau provide large, open foraging areas during both nesting and non-nesting seasons (Hays and Dobler 2004).

In the winter, prairie falcons can be observed hunting across the expansive open areas of the county or perched on utility poles on the plateau. Four Audubon Christmas Bird Count (CBC) circles include portions of Douglas County. Three (Bridgeport, Chelan, and Wenatchee) are located along the Columbia River. The fourth is located at Steamboat Rock State Park on Banks Lake. Since 2000, prairie falcons have been recorded each year during one or more of these counts. The Chelan CBC recorded one prairie falcon in each of the following years: 2001, 2005, 2006, 2008, 2009, and 2010, and reported three in 2012. The Bridgeport CBC recorded one prairie falcon in 2001 and 2003, two in 2007, and one in 2008. The Wenatchee CBC recorded one prairie falcon 3 in 2000, one in 2002 and 2003, four in 2004, one each year in 2005, 2006, 20007, 2008, and 2009, three in 2011, and two in 2012. At Steamboat Rock State Park, five were recorded in 2000, two in 2001, one in 2003, three in 2004, and one each year in 2006, 2007, 2010, 2011, and 2012. Historical Audubon CBCs may be accessed at http://netapp.audubon.org/CBCObservation/Historical/ResultsByCount.aspx#.

Surveys conducted in conjunction with various projects have also documented prairie falcons in Douglas County. Prairie falcons were recorded during surveys along the 230 kV transmission line route across the western Waterville Plateau from Wells to Rocky Reach in September 2008 (Douglas County PUD 2009). Several prairie falcons were documented on or near basalt cliffs along Banks Lake, including confirmed nesting at Steamboat Rock State Park and Northrup Canyon (USFWS 2003a). BLM stated that prairie falcons have been documented near a proposed road maintenance project along Douglas Creek in southern Douglas County (BLM 2012). Figure J-5 displays the Habitat Suitability Index for potential habitats in Douglas County (see page J-21).

Predation

Other than great-horned owls, adult prairie falcons are seldom killed by predators. Before fledging, young prairie falcons can be preyed upon by coyotes (*Canis latrans*), badgers (*Taxidea taxus*), bobcats (*Lynx rufus*), golden eagles, and great-horned owls (Tesky 1994).

Brewer's Sparrow (*Spizella breweri*)
Status: No Federal Status, No State Status

There are two recognized sub-species of Brewer's sparrow: the sagebrush Brewer's sparrow (*Spizella breweri breweri*) and the Timberline Brewer's sparrow (*Spizella breweri taverneri*) (Holmes and Johnson 2005). The timberline Brewer's sparrow nests in alpine regions in two distinct geographic areas: 1) east-central Alaska south to the southeastern Yukon and 2) the interior of northwestern British Columbia and western Alberta south to northwestern Montana. The timberline Brewer's sparrow does not breed in Washington (Hansley and Beauvais 2004a). The following account deals only with the sagebrush Brewer's sparrow (*Spizella breweri breweri*).

Physical Description

The Brewer's sparrow is a fairly nondescript, small, slim, little bird with a relatively long, notched tail. It varies in length from five to six inches and .3 to .4 ounces in weight. The small brown bill has a dusky tip and is conical in shape. Its crown is brown and streaked with black. The underparts are pale or buffy brown and streaked with black. The rump and back are brown and the back has dark brown spots or streaks. The wings are brown with two light buff wing bars. The underparts are dull white or light grey and unstreaked and the sides washed with greyish buff. Sexes are similar in size and appearance. Juveniles are similar to adults except they have streaked chests (Sibley 2000; Gebauer 2004; Hansley and Beauvais 2004a).

Habitat Requirements

Sagebrush Brewer's sparrows are a sagebrush-obligate species and are closely associated with shrublands dominated by big sagebrush (*Artemisia tridentata*) (Walker 2004; Holmes and Johnson 2005; Azerrad et al 2011). They nest in habitat that may be characterized as semi-desert shrub-steppe, shrub-steppe, short-grass prairie, and the transition between shrub-steppe and short-grass prairie (Walker 2004). One or more species of big sagebrush typically dominate breeding habitat, including Wyoming big sagebrush (*Artemisia tridentate wyomingensis*), basin big sagebrush (*A. t. tridentate*), and mountain big sagebrush (*A. t. vaseyana*). Other species that may be dominate or co-dominate in nesting habitat include threetip sagebrush (*A. tripartite*), silver sagebrush (*A.cana*), black sagebrush (*A. nova*), little sagebrush (*A. arbuscula*), white sagebrush (*A. ludoviciana*), Bigelow sagebrush (*A. bigelovii*), tarragon (*A. dracybcykys*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), and antelope rabbitbrush (*Pusshia tridentata*) (Walker 2004). Sagebrush Brewer's sparrow also nest in transition areas where big sagebrush is next to or intermingled with scabland sagebrush (*A. rigida*), bud sagebrush (*Picrothamnus desertorum*), shadscale saltbush (*Atriplex confertifolia*), winerfat (*Krascheninnikovia lanata*), green ephedra (*Ephedra viridis*), spiny hopsage (*Grayia spinosa*), broom snakeweed (*Gutierrezia sarothrae*), black greasewood (*Sarcobatus*

vermiculatus), and curl-leaf mountain mahongany (*Cercocarpus ledifolius*) (Walker 2004). Occasionally, sagebrush Brewer's sparrows nest in shrub habitats devoid of big sagebrush, including regenerating clearcuts and brushy slopes with greenleaf manzanita (*Arctostaphylos paula*), snowbrush ceanothus (*Ceanothus velutinus*), shrubby cinquefoil (*Dasiphora floribunda*), golden current (*Ribes aureum*), antelope bitterbrush (*Purshia tridentata*), curl-leaf mountain mahongany (*Cercocarpus ledifolius*), serviceberry (*Amelanchier* spp.) and snowberry (*Symphoricarpus* spp.) (Walker 2004).

Within shrub-dominated habitat, sagebrush Brewer's sparrows prefer areas with an average canopy height of 1.7- 5 feet (Hansley and Beauvais 2004a; Walker 2004). The number of birds declines when sagebrush cover is lower than 10 percent or greater than 50 percent (Hansley and Beauvair 2004a). In Eastern Washington, they prefer shrub-steppe with deep, loamy soils and areas with less than 20 percent grass cover (Ashley and Stovel 2004; Hansley and Beauvais 2004a). Heavy livestock grazing that results in poor range conditions can negatively affect abundance of sagebrush Brewer's sparrows (Holmes and Johnson 2005).

Nesting

Nests are usually placed in live or mostly live sagebrush that are .8 to 6.3 feet in height, with the nest built .7 to 1.6 feet above the ground in dense foliage, although nests may be as low as .23 to as high as 3.4 feet above the ground (Hansley and Beauvais 2004a; Walker 2004). Other shrubs used for nesting include spiny hopsage, antelope bitterbrush, yellow rabbitbrush, rubber rabbitbrush, black greasewood, and western snowberry (*Symphoricarpus occidentalis*) (Walker 2004). Sagebrush Brewer's sparrows rarely nest in Douglas fir (*Pseudotsuga menziesii*) saplings, hawthorn (*Crataegus* spp.), wild rose (*Rosa* spp.), spotted knapweed (*Centaurea biebersteinii*), or giant wildrye (*Leymus condensatus*) (Walker 2004). Nesting occurs at elevations from 1000 to over 10,000 feet, but they prefer wide, flat valleys with extensive shrub-steppe habitat and limited soil disturbance (Walker 2004). Survival of nests in continuous habitat was 68 percent higher than those in fragmented landscapes (Vander Haugen 2007).

Nesting activities begin with the arrival of adults to the nesting areas, usually mid-March to early May, and extend to early August (Holmes and Johnson 2004). Adults can breed at one year of age (Hansley and Beauvais 2004a). Nest construction takes four to five days, and egg laying begins soon after. The usual clutch size is three to four, with two and five less common. Incubation takes 10-12 days, and the male participates in incubation (Hansley and Beauvais 2004a; Mahony et al. 2001). The young fledge 6-12 days after hatching, and they become fully independent about 30 days after fledging (Klott1997; Walker 2004; Holmes and Johnson 2005).

Sagebrush Brewer's sparrow will re-nest after a failed nesting attempt, and often produce double broods (Holmes and Johnson 2005). Triple brooding has been reported (Mahony et al. 2001).

Diet

Sagebrush Brewer's sparrows are highly insectivorous during the breeding season, and forage within the shrub-steppe breeding habitat. They will also utilize wetlands, mesic ravines, and aspen ravines for food gathering, especially after the young have fledged (Gebauer 2004; Hansley and Beauvais 2004a). Foraging normally occurs in larger, more vigorous plants and includes searching for insects and other invertebrates in foliage, stems, and bark (Gebauer 2004; Hansley and Beauvais 2004a). Diet includes spiders, barklice, and larvae of Lepidoptera, Hemiptera, and Homoptera, alfalfa weevils, aphids, leafhoppers, and beetles (Sarell and McGuiness 1996; Hansley and Beauvais 2004). Flying insects are also captured (Hansley and Beauvais 2004a). As summer progresses, the diet gradually shifts to seeds; the winter diet is almost exclusively seeds of grasses and forbs (Klott 1977).

Distribution and Range

The sagebrush Brewer's sparrow nests from southern British Columbia (Okanagan Valley), Central Alberta and southwestern Saskatchewan, south through Washington, Oregon, and California east of the Cascade Mountains, east across southern Idaho, throughout most of Montana, Nevada, Utah, Wyoming, Colorado, into Northern Arizona and New Mexico, and into parts of extreme western North and South Dakota and Nebraska. (Klott 1999; Gebauer 2004; Hansley and Beauvais 2004a). Winter distribution includes southern California, Arizona, and New Mexico, as well as West Texas south through Baja and Central Mexico (Klott 1997; Gebauer 2004; Hansley and Beauvais 2004a; Holmes and Johnson 2005).

In Washington, sagebrush Brewer's sparrow nests in shrub/steppe habitat east of the Cascade Mountains from the Columbia River north to the Canadian border in Okanogan County, east to Spokane, and south to the Snake River and Walla Walla, then west along the Columbia River to Lyle (Ashley and Stovall 2004; KVA 2004). The majority of birds nest in Okanogan, Douglas, Grant, Lincoln, Kittitas, and Adams counties (Ashley and Stovall 2004; KVA 2004).

Douglas County Range

There is little specific information concerning the distribution of sagebrush Brewer's sparrow in Douglas County. They can be expected to inhabit any appropriate shrub-steppe habitat in the County. Figure J-6 displays the Habitat Suitability Index for potential habitats in Douglas County.

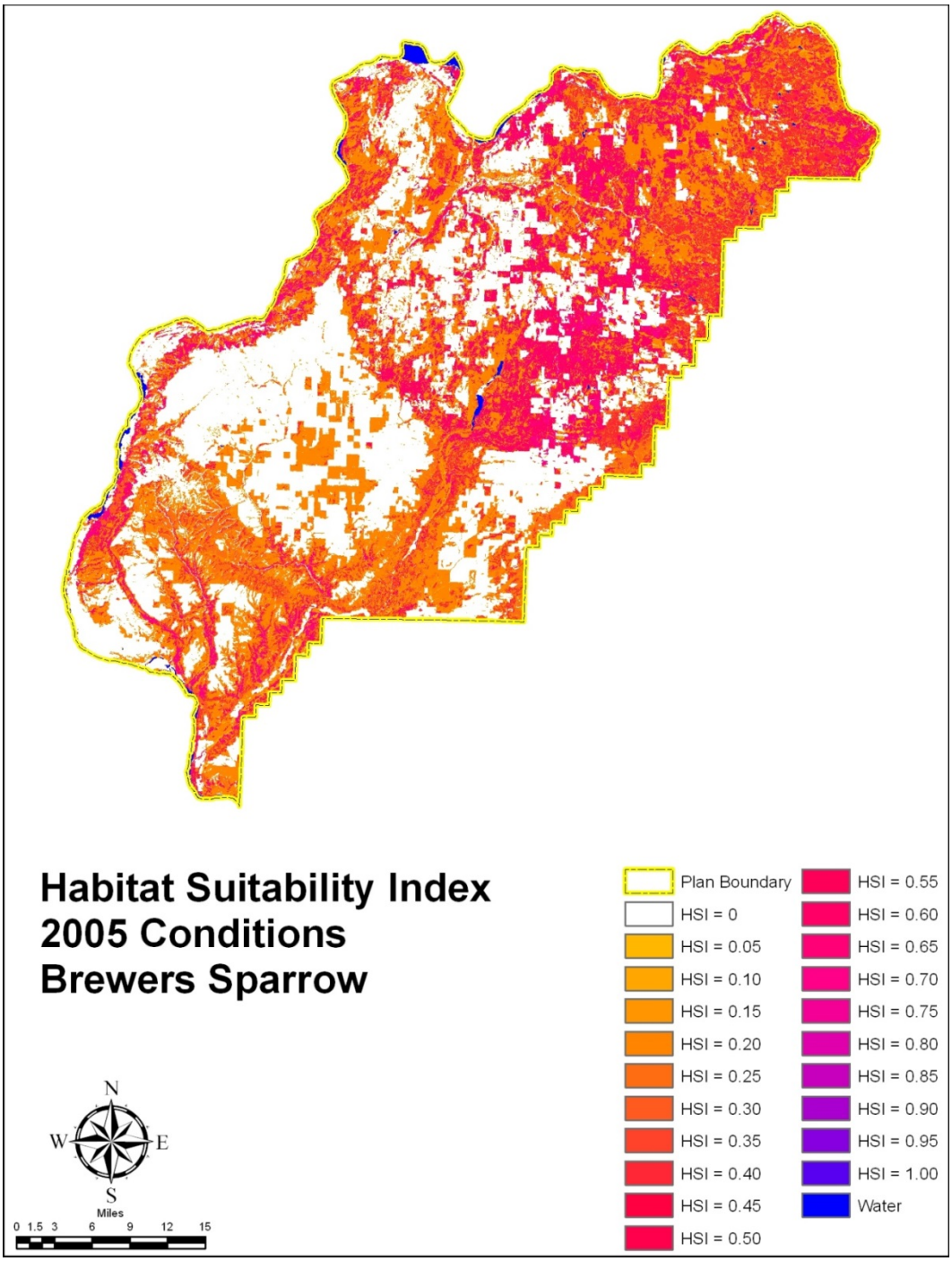


Figure J-6: Habitat Suitability Index 2005 Conditions, Brewer's Sparrow

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Population Status

The sagebrush Brewer's sparrow was perhaps the most abundant bird in the intermountain West, as well as the most abundant bird in appropriate sagebrush habitats (Ashley and Stovall 2004; KVA 2004; Holmes and Johnson 2005). However, they have been on a significant downward trend for the past 25-30 years (Saab and Rich 1997; Ashley and Stovall 2004; Hansley and Beauvais 2004a; Holmes and Johnson 2005). Population trends show a decline in most states. Although there has been a steep, significant decline in the Columbia Plateau, there is not enough data from Washington to know if the population is following the general, overall, downward population trend (Paige and Ritter 1999). Shrub-steppe fragmentation in Eastern Washington may be acting as a population sink (Vander Haegen 2007). Due to continuing population declines and reductions in breeding habitat, the sagebrush Brewer's sparrow is becoming a species of major conservation concern across its breeding range, and was regarded as a species of high concern by Saab and Rich (1997) (Hansley and Beauvais 2004a).

Predation

Sagebrush Brewer's sparrows are preyed upon by a range of reptiles, birds, and mammals. Nestlings and eggs are taken by gopher snake (*Pituophis melanoleucus*), Townsend's ground squirrel (*Urocitellus townsendii*), loggerhead shrike (*Lanius ludovicianus*), raven (*Corvus corax*), black-billed magpie (*Pica pica*), long-tailed weasel (*Mustela frenata*), least chipmunk (*Eutamias minimus*), and western rattlesnake (*Crotalus viridis*) (KVA 2004). American kestrel (*Falco sparverius*), prairie falcon (*Falco mexicanus*), and coachwhip snake (*Masticophis flagellum*) have been documented preying on adults (KVA 2004).

Sagebrush Sparrow (*Artemisiospiza nevadensis*)
Status: Federal Status-None; State-Candidate

The taxonomic status of the sagebrush sparrow (formally sage sparrow—*Amphispiza belli*) has been revised over the past two years. In 2012, the American Ornithological Union (AOU) changed the genus name from *Amphispiza* to *Artemisiospiza* (Chesser et al. 2012). In 2013, the AOU split *Artemisiospiza* belli into two species, the sagebrush sparrow (*Artemisiospiza nevadensis*), and Bell's sparrow (*Artemisiospiza belli*) (Chesser et al. 2013). This account will only deal with the sagebrush sparrow (*Artemisiospiza nevadensis*).

Physical Description

The sagebrush sparrow is a medium-sized sparrow with a length of 4.75 to 6.3 inches and a weight of .6 to .7 ounces (Rising 1996; Sibley 2000; Hansley and Beauvais 2004b). They have a

grey-brown head and sandy-brown back, with faint streaks on the back and on the buff flanks. The breast is whitish, with a dark spot in the center. The tail is square at the end and blackish brown in color. A white throat is set off by black malar stripes. The sexes are similar in appearance. Juveniles have heavy brown streaking on their breasts (Rising 1996; Hansley and Beauvais 2004b).

Habitat Requirements

Sagebrush sparrows are sagebrush obligates with a preference for areas dominated by big sagebrush, intermingled with perennial bunchgrasses (Paige and Ritter 1999). Areas of large, contiguous stands of tall sagebrush totaling approximately ½ section may be required to attract nesting sagebrush sparrows (Paige and Ritter 1999; Holmes and Johnson 2005), although other studies suggest that sagebrush stands of at least 30 acres are sufficiently large to provide nesting habitat (Hansley and Beauvais 2004b). Nesting occurs in the interior of sagebrush stands, rather than along the periphery (Hansley and Beauvais 2004b). Nesting stands of big sagebrush may also contain antelope bitterbrush (*Purshia tridentata*), saltbush (*Atriplex canescens*), shadscale saltbush (*Atriplex confertifolia*), rabbitbrush (*Chrysothamnus*) and greasewood (*Sarcobatus* spp.) (Holmes and Johnson 2005).

Nesting

Sagebrush sparrows normally place their nests in tall, living sagebrush in the densest stand available in the breeding territory; nests are occasionally placed on the ground under a shrub (Paige and Ritter 1999; Hansley and Beauvais 2004b). Nests are typically 3-40 inches above the ground in the middle of a tall live shrub with abundant foliage (Hansley and Beauvais 2004b). The breeding season begins in late March and extends to early August (Hansley and Beauvais 2004b; Holmes and Johnson 2005). The normal clutch size is three to four, with five rarely observed (Hansley and Beauvais 2004b). Incubation takes 10 to 16 days; the female does most of the incubating (Holmes and Johnson 2005). The young fledge at 9-10 days and are fed by the parents for approximately two weeks after leaving the nest (Holmes and Johnson 2005). Sagebrush sparrows will re-nest if a clutch is lost. Double and even triple broods have been documented (Holmes and Johnson 2005; Vander Haegen 2007).

Diet

Sagebrush sparrows are opportunistic, ground-foraging omnivores, and are more insectivores than most other sparrows (Hansley and Beauvais 2004b; Holmes and Johnson 2005). Foods eaten during the breeding season include small fruits, seeds, adult and larval insects, spiders, seeds, and succulent vegetation (Holmes and Johnson 2005). Food is gleaned from the ground under or near shrubs or from the lower stems and leaves of shrubs (Gebauer 2004a; Holmes and Johnson 2005). Birds walk or hop on the ground, running across open areas between shrubs (Hansley and Beauvais 2004b). Arthropods make up 70 percent or more of the diet during the nesting season; grasshoppers are consumed in greater numbers during August (Hansley and

Beauvais 2004b). In May and June, larvae of Coleoptera, Orthoptera, and Lepidoptera comprise much of the diet (Holmes and Johnson 2005). Seeds comprise much of the diet in April, July, and August (Holmes and Johnson 2005).

Range and Distribution

The breeding range of the sagebrush sparrow extends from northwestern New Mexico and northeastern Arizona, north through eastern California, Nevada, western Colorado, southwestern Wyoming, southern Idaho, eastern Oregon, and central Washington (Chesser 2013).

Winter distribution includes western Texas, northern Mexico and Baja, north through southeastern California, east across Nevada, southwestern Utah, Arizona, and central New Mexico (Chesser 2013).

In Washington, sagebrush sparrows are found in appropriate shrub-steppe habitat in the central portions of the state. They have been documented in Benton, Yakima Adams, Franklin, Grant, Kittitas, Lincoln, Douglas, and Okanogan counties (Vander Haegen 2004a).

Douglas County Range

The sagebrush sparrow is a sagebrush-obligate species and is closely associated with shrublands dominated by big sagebrush intermingled with an understory of perennial bunchgrass (Holmes and Johnson 2005). It may occur throughout Douglas County where appropriate habitat is present. Figure J-7 displays the Habitat Suitability Index for potential habitats in Douglas County.

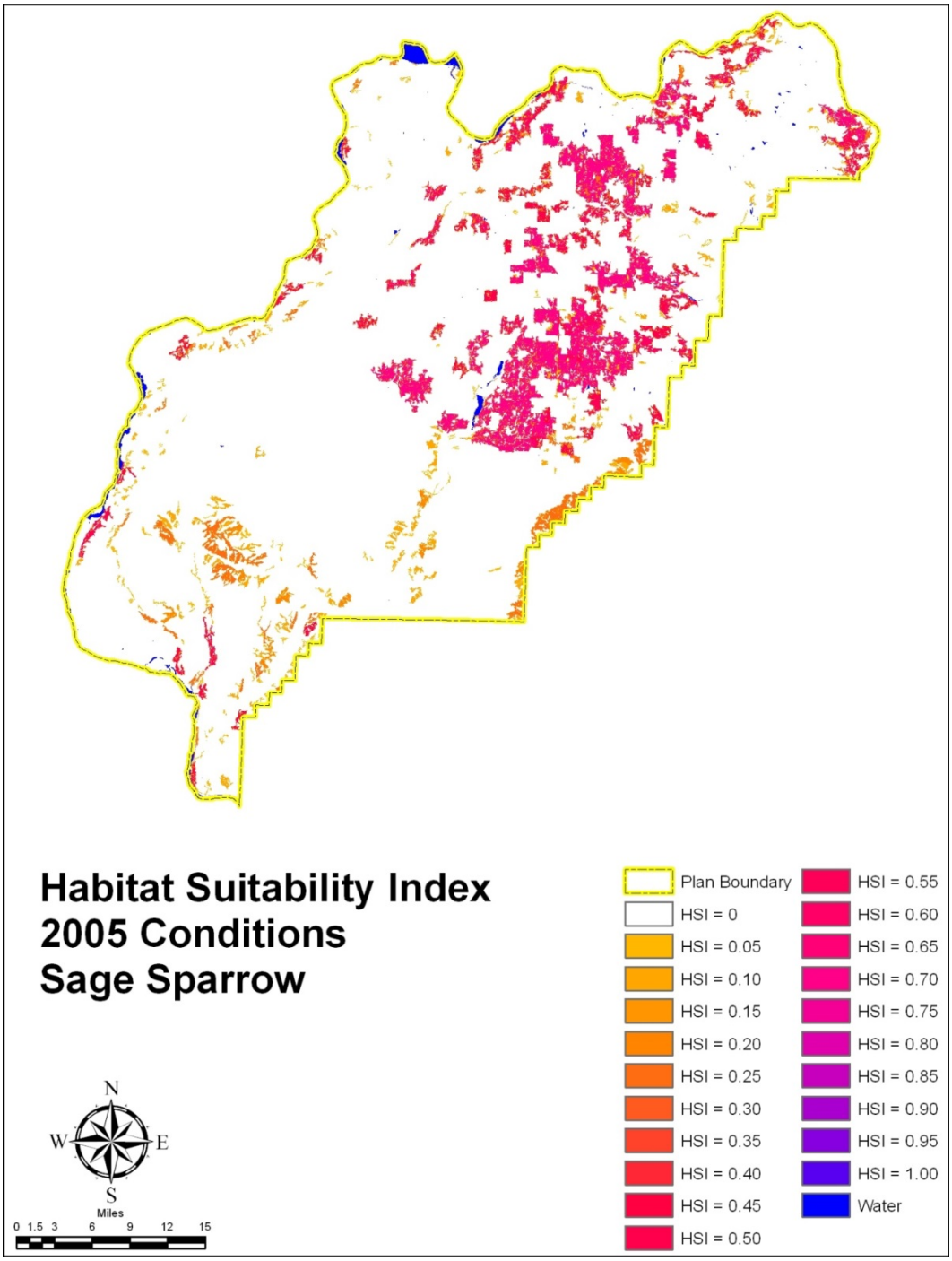


Figure J-7: Habitat Suitability Index 2005 Conditions, Sagebrush Sparrow

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Population Status

Historically probably one of the most abundant birds in the intermountain West, the sagebrush sparrow is generally regarded as much less abundant today (Hansley and Beauvais 2004b). Although a long-term decline may have taken place, the BBS data is inconclusive as to the significance and extent of this decline (Hansley and Beauvais 2004b). Due to its close association with sagebrush habitat, the population of sagebrush sparrows is directly tied to the health of this habitat type. Shrub-steppe fragmentation in Eastern Washington may be acting as a population sink (Vander Haegen 2007). Saab and Rich (1997) listed the sagebrush sparrow as a species of high management concern for the Interior Columbia River Basin.

Predation

Predation of eggs and nestlings can be heavy, reaching 90 percent, and is the major cause of nest mortality (Holmes and Johnson 2005). Documented or suspected nest predators include common raven, Townsend's ground squirrel, black-billed magpies, snakes, long-tailed weasel (*Mustela frenata*), and chipmunks (*Neotamias* spp.) (Holmes and Johnson 2005). Predators of adult sagebrush sparrows include great-horned owl, loggerhead shrike, and merlin (Hansley and Beauvais 2004b).

Sage Thrasher (*Oreoscoptes montanus*)
Status: Federal Status-None; State-Candidate

Sage thrashers are medium-sized passerine birds that depend upon areas of tall, dense sagebrush within large tracts of shrub-steppe habitat. Their range covers much of Western North America.

Physical Description

The sage thrasher is in the family Mimidae, which includes the mockingbirds and catbirds (Sibley 2000). It is slightly smaller than the American robin, with a length of 7.8 to 9.0 inches and a weight of 1.4 to 1.8 ounces (Buseck et al. 2004). Sage thrashers have buffy-white underparts heavily streaked with brown. The upperparts are drab, brownish-gray and the feathers have darker centers, which creates distinct streaking, especially on the crown (Buseck et al. 2004). The wings are slightly darker than the back and have two narrow white wing bars. The tail is even darker on top, with buff underneath; the outer tail feathers have white tips (Sibley 2000; Buseck et al. 2004). Males and female are similar in appearance. Juvenile plumage is similar to adults, but normally has paler, less-evident streaking on underparts (Buseck et al. 2004).

Habitat Requirements

Sage thrashers are considered a shrub-steppe obligate species and are dependent upon areas of tall, dense sagebrush within large tracts of shrub-steppe habitat (Paige and Ritter 1999; Vander Haegen 2004b; Buseck et al. 2004). In shrub-steppe communities in eastern Washington, sage thrashers are more abundant on loamy and shallow soils than areas of sandy soils and on rangelands in good and fair condition than those in poor condition (Vander Haegen et al. 2000, Vander Haegen 2004b). The presence of sage thrashers is positively associated with percent woody plant, bare ground, and vertical heterogeneity, and negatively associated with increased annual grass cover and disturbed areas (Cannings 1995a; Dobkin and Sauder 2004). Total shrub cover and abundance of shrub species, especially sagebrush, are important habitat features for sage thrashers. Sage thrashers prefer sagebrush-steppe habitat on flat or gently rolling terrain (Buseck et al. 2004).

Nesting

Sage thrashers nest in sagebrush steppe habitat dominated by big sagebrush (*Artemisia tridentate*) where shrublands provide nesting and security cover (Paige and Ritter 1999; Buseck et al. 2004). They nest at elevations ranging from 2,300 in the Columbia Basin to approximately 6,500 in mountainous areas (Paige and Ritter 1999). Nests are normally placed well within or under big sagebrush or three-tip sagebrush (*A. tripartite*), but have also been documented in rabbitbrush (*Chrysothamnus* spp.), black greasewood (*Sarcobatus vermiculatus*), low sagebrush (*A. nova*), antelope bitterbrush (*Purshia tridentata*), horsebrush (*Tetradymia canescens*), and juniper (*Juniperus osteosperma*) (Buseck et al. 2004). Bushes selected for nests are healthy plants with 70-100 percent living foliage that are taller than 2.3 feet and that have low branches and foliage within one foot of the ground (Buseck et al. 2004; Gebauer 2004b). Nests are placed on the ground or in a shrub up to three feet above ground (Ashley and Stovel 2004). In order to enhance thermal regulation, early nests are placed on or near the ground, while later nests are placed off the ground in main branches of sagebrush (Buseck et al. 2004). Overhead foliage is important for thermal regulation and to prevent detection by potential avian predators; nests are almost always placed 1.5 feet below the shrub (Cannings 1995a; Paige and Ritter 1999; Buseck et al. 2004).

In Washington, egg-laying begins in mid-April (Gebauer 2004b). Number of eggs ranges from one to seven, with four or five being the normal clutch size (Gebauer 2004b). Incubation takes 11-17 days and the young fledge after 10-14 days (Ashley and Stovel 2004; Buseck et al. 2004; Gebauer 2004b). Sage thrashers will re-nest if a clutch is lost and may raise two broods. Both the female and male participate in incubation and feeding the young. The young are fed for approximately seven days after leaving the nest (Ashley and Stovel 2004).

Diet

Sage thrashers are opportunistic birds that feed on a variety of invertebrates, as well as small fruits, especially berries (Gebauer 2004b). Their diet includes ants, crickets, locusts, beetles, grasshoppers, true bugs, moth larvae, caterpillars, weevils, leafhoppers, flies, spiders, bees,

currents (*Ribes* spp.), gooseberries, blackberries, Saskatoon (*Amelanchier alnifolia*) berries, and grapes (Blood 1995; Paige and Ritter 1999; Buseck et al. 2004; Gebauer 2004b). Sage thrashers may occasionally eat the eggs of other shrub-steppe bird species (Vander Haegen et al. 2002). Foraging occurs primarily on the ground, as well as in low foliage, normally close to the nest sites (Buseck et al. 2004; Gebauer 2004b).

Range and Distribution

The sage thrasher is a sagebrush-steppe obligate (Buseck et al. 2004). Its breeding range extends from south-central British Columbia, southeast Alberta, and southwest Saskatchewan, south through much of the western United States to southeastern California, northern Arizona, and northern New Mexico. Breeding range extends east to western Oklahoma, western and southern Colorado, Wyoming, and southeastern Montana (Buseck et al. 2004). The winter range of the sage thrasher includes southern California, southern Nevada, central and southern Arizona and New Mexico, western Texas, Central Mexico, and Baja (Buseck et al. 2004).

In Washington, sage thrashers nest from the Canadian border in the Okanogan Valley, south through Central Washington to the Oregon border. Sage thrashers have been documented in Walla Walla, Benton, Yakima, Adams, Franklin, Lincoln, Kittitas, Douglas, and Okanogan counties (Vander Haegen 2004b). Nesting has been confirmed in Douglas, Grant, Lincoln, Adams, Yakima, and Kittitas counties. Core habitat also exists in Okanogan, Chelan, Whitman, Franklin, Walla Walla, Benton, Klickitat, and Asotin counties (Ashley and Stovel 2004).

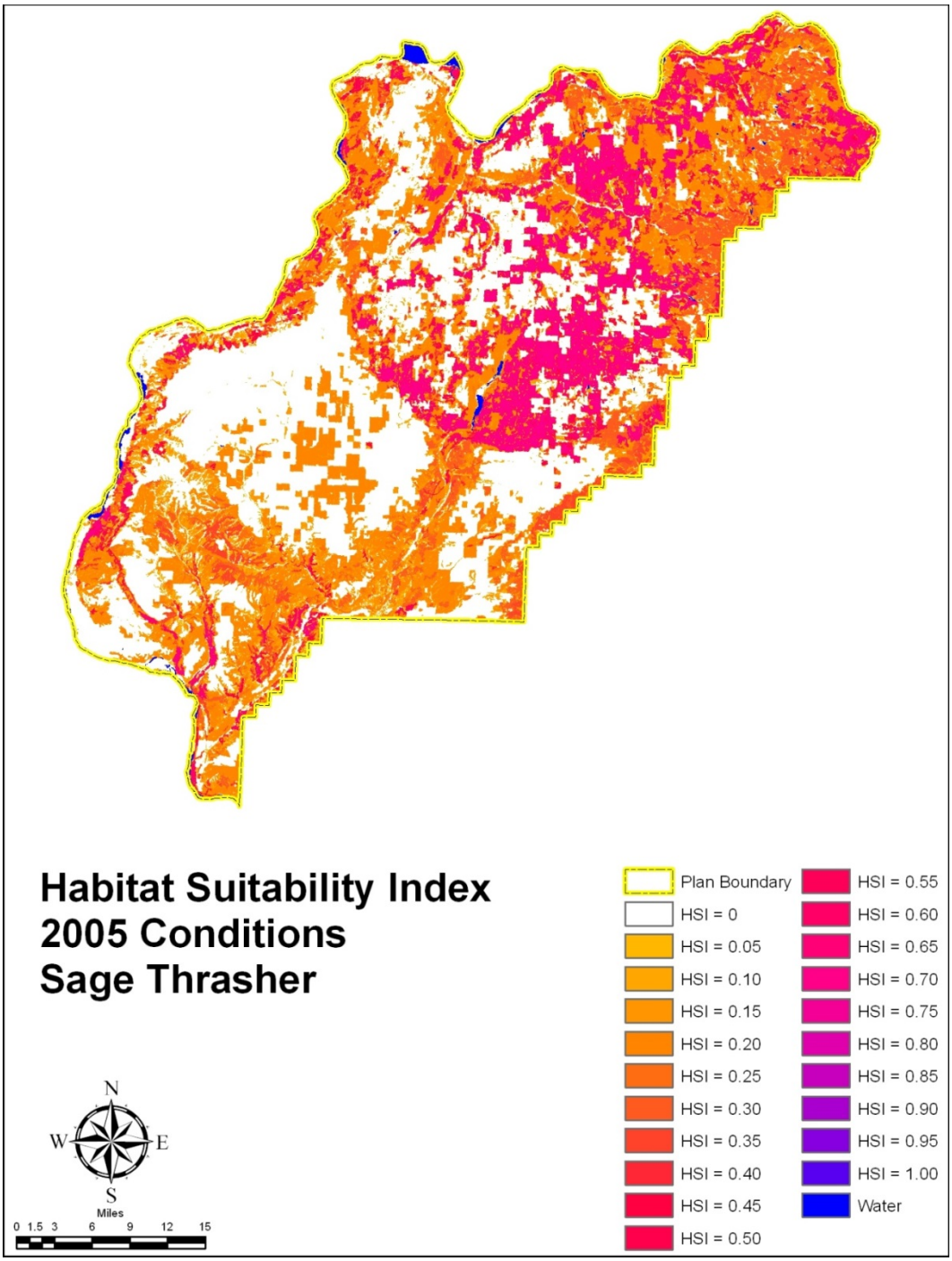


Figure J-8: Habitat Suitability Index 2005 Conditions, Sage Thrasher

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Douglas County Range

The sage thrasher is closely associated with shrub-steppe communities dominated by tall, dense sagebrush (*Artemisia* spp.) (Vander Haegen 2004b). It may occur throughout Douglas County where appropriate habitat is present. Sage thrasher nesting has been documented in Douglas County. Figure J-8 displays the Habitat Suitability Index for potential habitats in Douglas County.

Population Status

Saab and Rich (1997) listed the sage thrasher as a species of high management concern for the Interior Columbia River Basin. Breeding Bird Surveys (BBS) suggest an overall decline across its breeding range of 1.4 percent per year between 1980 and 2003 (Buseck et al. 2004). Significant declines were detected in Fish and Wildlife Service Region 1 of 1.7 percent and the Columbia Plateau of 1.4 percent (Buseck et al. 2004; Dobkin and Sauder 2004). Declines in population were attributed to conversion of habitat (Ashley and Stovel 2004; Buseck et al. 2004; Dobkin and Sauder 2004).

Predation

Sage thrasher eggs and young are vulnerable to various predators, including canids (coyote and domestic dog), mustelids, snakes, ground squirrels, corvids, and laniids (Buseck et al. 2004). Specific species include gopher snakes (*Pituophis catenifer*), Townsend's ground squirrel (*Urocitellus townsendii*), and loggerhead shrikes. Ravens, magpies, least chipmunks (*Neotamias minimus*), deer mice (*Peromyscus maniculatus*), and northern grasshopper mice (*Onychomys leucogaster*) have also been documented as predators of eggs/nestlings (Vander Haegan et al. 2002).

Grasshopper Sparrow (*Ammodramus savannarum perpallidus*)
Status: Federal Status-None; State-Monitor

Four subspecies of grasshopper sparrows are recognized in North America (Slater 2004). The following account will deal only with *Ammodramus savannarum perpallidus*.

Physical Description

The grasshopper sparrow is a small, flat-headed, inconspicuous bird with a length of 4.1 to 5.1 inches and a weight of .5 to.7 ounces (Rising 1996; Slater 2004). The dark, blackish crown is narrowly streaked with buff and divided by a pale buff-white median crown stripe (Paczek 2004). The nape and side of the neck is grayish-buff, with fine chestnut or reddish brown streaks in the feather centers (Rising 1996; Paczek 2004). The back feathers are edged with pale buff or rusty and streaked with chestnut. The brown tail is short and sharp and the rectrices are pointed with bare shaft tips. Tail feathers are edged in pale grayish brown and the outermost feathers are broadly edged with grayish white tips (Rising 1996; Paczek 2004). The throat is pale buffy and the breast and flanks are buffy white and unmarked or lightly marked; the belly is whitish and

the undertail-coverts are pale buffy (Rising 1996). Juveniles have a band of streaks across their breast (Paczek 2004). Males and females have similar plumage (Smith 1968).

Habitat Requirements

Grasshopper sparrows select grasslands of moderate height (approximately one foot), often with clumped vegetation inter-mixed with patches of bare ground (Ashley and Stovel 2004; Slater 2004). Additional preferred features include moderately-deep litter and sparse coverage of woody vegetation (Ashley and Stovel 2004). In north-central Oregon, grasshopper sparrows were associated with native bunchgrass communities dominated by *Agropyron spicatum* and/or *Festuca idahoensis* (Janes 1983). This species is area sensitive and requires grassland patches of 30 acres or more (Slater 2004). In Washington, grasshopper sparrows may also be associated with bunchgrass/sagebrush and rabbitbrush habitats (*Chrysothamnus* spp.) (Cannings 1995). They prefer habitat that is unaffected or only slightly affected by grazing (Smith et al. 1997).

Nesting

Grasshopper sparrow nests are usually hidden at the base of clumps of grass, clover, dead vegetation, or other cover, and are extremely hard to locate (Smith 1968). The nest is built with an arch or dome, giving it a domed appearance with side entrance, and is placed in a depression, so the rim of the nest is at or near ground level (Smith 1968; Slater 2004; Paczek 2004). Nesting activity begins soon after birds arrive from their wintering areas, which is late April in north-central Oregon (Janes 1983). The number of eggs varies from three to six, with four or five the usual clutch size (Smith 1968; Slater 2004). Only the female incubates the eggs, which hatch after 11-13 days (Smith 1968; Paczek 2004; Slater 2004). Both adults feed and care for the young, which fledge after approximately 9 days (Smith 1968; Slater 2004). Both parents tend to the young for 4-19 days after fledging (Paczek 2004). Grasshopper sparrows will re-nest if a nest is destroyed, sometimes re-nesting three to four times if necessary to produce a successful brood (Dechant et al. 1998), and will produce two, and sometimes three, broods during a breeding season (Smith 1968; Cannings 1995b; Alder and Ritchison 2011).

Diet

The grasshopper sparrow forages predominately on the ground (Slater 2004). Insects and other invertebrates compose the majority of the food consumed, including grasshoppers, spiders, myrianpods, snails, earthworms, beetles, crickets, caterpillars, ants, leafhoppers, assassin bugs, and soldier bugs (Smith 1968; Slater 2004; Alder and Ritchison 2011). Seeds from the following plants are also eaten: wood sorrel (*Oxalias* spp.), ragweed (*Ambrosia* spp.), pigeon grass (*Setaria* spp.), panic grass (*Panicum* spp.), smartweed (*Polygonum* spp.), purslane (*Portulata* spp.), ribgrass (*Plantago* spp.), sedge (*Carex* spp.), bristlegrass (*Setaria* spp.), sheepsorrel (*Raumex* spp.), and sunflower (*Helianhus* spp.) (Smith 1968; Slater 2004).

Range and Distribution

Grasshopper sparrows have a very broad range across North and Central America. They breed from southeastern Alberta, across southern Canada, south through eastern United States to the Carolinas, central Georgia, Alabama and Mississippi, northern Louisiana, and most of Texas, west to northeastern Arizona, and north to central Colorado and Wyoming, and Montana (Smith 1968; Rising 1996; Slater 2004).

In western North America, grasshopper sparrows nest in southern British Columbia, eastern Washington and Oregon, central Idaho, northeastern and north-central Nevada, southern Utah, the California coast and the western edge of the Sierra Nevada, central Colorado, and southwestern Wyoming (Smith 1968; Slater 2004). The range is spotty across much of the West due to the presence of mountains and deserts (Smith 1968). The grasshopper sparrow also breeds in parts of Mexico and Central America and on islands in the Caribbean (Rising 1996; Slater 2004). Isolated populations nest in Arizona and Florida (Rising 1996).

In Washington, the grasshopper sparrow's distribution is uneven and occurs in the eastern portion of the state (Ashley and Stovel 2004). It is uncommon or common in shrub-steppe areas with significant grass cover (Smith et al. 1997). Core habitat includes grasslands, shrub savanna, shrublands, tree savannas, and Conservation Reserve Program areas (Smith et al. 1997). Counties with large areas of core habitat include Okanogan, Douglas, Grant, Lincoln, Spokane, Adams, Franklin, Walla Walla, Benton, Yakima, and Kittitas counties (Smith et al. 1997). Smaller areas are found in Asotin, Columbia, Garfield, Whitman, Klickitat, Chelan, Stevens, and Ferry counties (Smith et al. 1997).

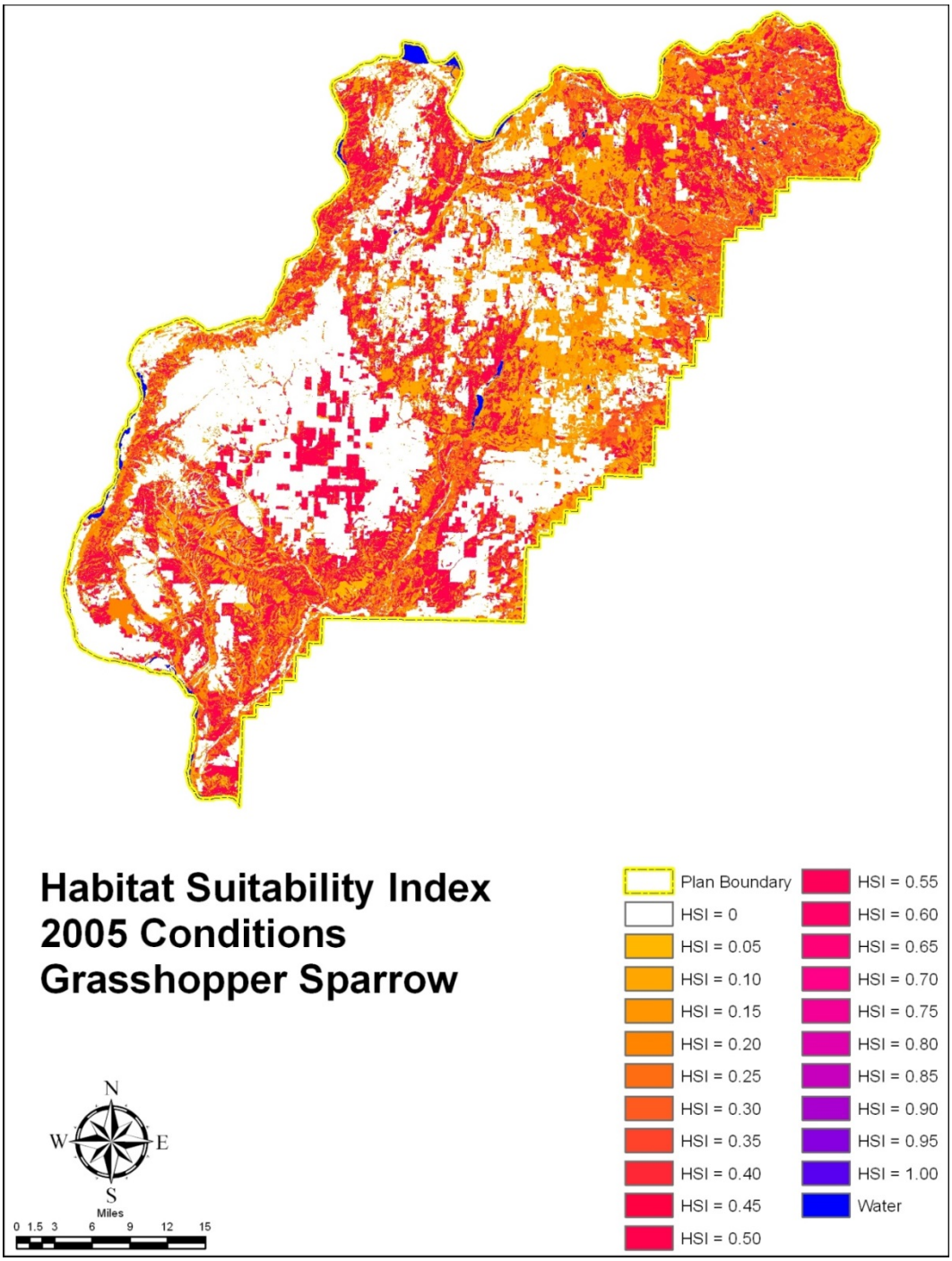


Figure J-9: Habitat Suitability Index 2005 Conditions, Grasshopper Sparrow

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Douglas County Range

The grasshopper sparrow may occur throughout Douglas County in appropriate habitats (Smith et al. 1997). According to Smith et al. (1997), nesting is "probable" in Douglas County. Figure J-9 displays the Habitat Suitability Index for potential habitats in Douglas County.

Population Status

The grasshopper sparrow population has experienced significant decline across the United States since 1966, with an annual decline of 3.8 percent, as determined from Breeding Bird Survey (BBS) data (Slater 2005). Dobkin and Sauder (2004) termed this decline "catastrophic." The decline in grasshopper sparrow populations in the Columbia Plateau has been 6.2 percent annually since 1968, also based on BBS data (Dobkin and Sauder 2004). In Canada, grasshopper sparrow populations have declined at a rate of 4.8 percent annually between 1966 and 2000, and at a rate of 6.3 percent between 1980 and 2000, based on BBS data (Paczek 2004). In British Columbia, the grasshopper sparrow is listed on the Provincial Red List (Paczek 2004).

Predation

Like similar species, both adults and eggs/young of grasshopper sparrows are subject to predation by a variety of birds and mammals, including striped skunk (*Mephitis aurantia*), spotted skunk (*Spilogale* spp.), raccoon (*Procyon lotor*), weasels (*Mustela* spp.), ground squirrels (*Urocitellus* spp.), foxes (*Vulpes* spp.), feral pigs (*Sus scrofa*), crows (*Corvus* spp.), snakes (*Coluber constrictor, Elaphe* spp., *Thamnophis sirtailis, Lampropeltis* spp., *Sistrurus miliarus*), and domestic cat (*Felis silvestrus*) (Slater 2005). The primary avian predator on adult grasshopper sparrows is the loggerhead shrike (*Lanium ludovicianus*) (Smith 1968; Slater 2005).

Lewis' Woodpecker (*Melanerpes lewis*)
Status: Federal Status-None; State-Candidate

Lewis's woodpeckers are one of the larger species of woodpeckers in North America and their range extends from southern Canada to the southwestern United States.

Physical Description

Lewis's woodpeckers range in length from 10.25 to 11.4 inches and in weight from 3.1 to 4.1ounces (Winkler et al. 1995; Abele et al. 2004). All upperparts—back, tail, and wings (including covets)—are glossy-green, which may appear black. Undertail and underwings are blackish-brown. The crown is black, while the face and belly are red. The breast is a pale gray/silver, which extends around to the nape and creates a collared appearance (Winkler et al. 1995; Abele et al. 2004). Plumage is the same on males and females. Juvenile birds are less glossy and drabber, with

brownish head, breast, and belly. They have little or no red on face and silvery collar is absent. Underparts may be barred brown and whitish (Winkler et al. 1995; Abele et al. 2004).

Habitat Requirements

Lewis's woodpeckers are birds of open ponderosa pine forests, recent burns, and riparian areas with mature cottonwoods (Winkler et al. 1995; Abele et al. 2004; Fylling 2013). They have been labeled "burn specialists" due to their preference for snags in burned ponderosa pine stands (Saab and Vierling 2001). They also nest in oak woodlands, commercial nut and fruit orchards, pinyon pine-juniper (*Pinus cembroides-Juniperus* spp.) woodlands, fir forests (*Abies concolor*), and cottonwoods surrounded by agriculture (Abele et al. 2004; Husak 2005; Fylling 2013). Preferred habitat features include open canopy (>75 percent), with shrub understory (13-17 percent), snags for nesting (>12 inches dbh) and perching, presence of dead or dying trees, and abundant insects (Abele et al. 2004; Gebauer 2004c; Fylling 2013). Open forest areas allow space for aerial foraging, which is the primary manner in which Lewis's woodpeckers capture food during the nesting season (Abele et al. 2004; Gebauer 2004c).

Irrespective of the exact habitat type, multiple cavities are required. During the nesting season, the male incubates the eggs at night and the female roosts in a nearby cavity (Cooper et al. 1998). Cavities are also used for roosting during the non-nesting season (Cooper et al. 1998).

Healthy undergrowth that produces abundant populations of the insects on which Lewis's woodpeckers feed is a critical component of their favored nesting habitat (Lewis et al. 2004). In eastern Washington, species typically present where this species nests include sagebrush (*Artemisia* spp.), golden current (*Ribes aureum*), bitterbrush (*Purshia tridentata*), and rabbitbrush (*Chrysothamnus* spp.) (Lewis et al. 2004).

Preferred winter habitat includes commercial nut orchards (especially almonds and walnuts), oak woodlands, areas adjacent to cornfields, as well as riparian woodlands and cornfields (Koehler 1983; Sousa 1983; Abele et al. 2004).

Nesting

Lewis's woodpeckers are cavity nesters, but are morphologically not well adapted for evacuating nesting cavities (Abele et al. 2004). They are normally secondary excavators, preferring to use existing naturally occurring cavities or usurp cavities from other woodpeckers, including pileated woodpecker (*Dryocopus pileatus*), hairy woodpecker (*Picoides villosus*), black-backed woodpecker (*P. arcticus*), or northern flicker (*Colaptes auratus*) (Abele et al. 2004; Fylling 2013). When they excavate their own nesting cavities, they do so in decaying trees with suitably soft wood; they have not been documented excavating in living trees (Abele et al. 2004; Fylling 2013). They commonly reuse cavities for nesting in successive years (Lewis et al. 2002; Abele et al. 2004; Gebauer 2004c). Riparian cottonwoods provide nesting sites due to the soft nature of rotting cottonwood, frequent occurrence of rotting trunks, and ample supply of insects in riparian

zones (Abele et al. 2004). Lewis's woodpeckers may form small colonies in some areas during the nesting season (Lewis et al. 2002; Gebauer 2004c).

In British Columbia, most Lewis's woodpeckers nested in ponderosa pine (*Pinus ponderosa*) or black cottonwood (*Populus balsamifera*) (Gebauer 2004c). Other tree species used for nesting included domestic cherry and apple, ornamental maple, Douglas-fir (*Pseudotsuga menziesii*), western larch (*Larix occidentalis*), trembling aspen (*Populus tremuloides*), alder (*Alnus rubra*), paper birch (*Betula papyrifera*), ornamental willow, elm and Lombardy poplar (Gebauer 2004c). On rare occasions, they will nest in utility poles, fence posts, and even buildings (Gebauer 2004c). Other studies have document additional trees used for nesting, including Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolar*), lodgepole pine (*P. contorta*), willow (*Salix* spp.), and juniper (*Juniperus* spp.) (Abele et al. 2004).

Depending on location, nesting activities begin in April or May, with egg-laying extending from mid-April to mid- June (Abele et al. 2004; Gebauer 2004c; Vande Voort 2011; Fylling 2013). The number of eggs ranges from 2-11, with an average of four to seven (Abele et al. 2004; Gebauer 2004c). Incubation lasts 12-16 days. Both the male and the female participate in incubation, with the male incubating mostly at night (Koehler 1983; Abele et al. 2004). Both parents tend to the young, and fledging takes place 28-34 days post-hatch (Abele et al. 2004; Gebauer 2004c). Re-nesting may occur if the first clutch is lost early in the nesting cycle (Abele et al. 2004). Juvenile birds are fed by the adults for at least 10 days after leaving the nest (Abele et al. 2004). Lewis's woodpeckers produce one brood per year (Abele et al. 2004; Vande Voort 2011).

Diet

As Lewis's woodpeckers lack morphological features that allow for significant wood excavation, they do not excavate for insects that live in wood, unlike most North American woodpecker species (Cooper et al. 1998; Abele et al. 2004; Gebauer 2004c; Vande Voort 2011). Lewis's woodpeckers are opportunistic forages and eat a variety of insects, fruit, and seeds. They use several foraging techniques to capture or collect their food (Cooper et al. 1998). The primary foraging technique is "hawking," which begins with the bird scanning for individual insects from a prominent perch at the end of a dead branch or top of tree (Koehler 1983; Abele et al. 2004). When an insect is spotted, the waiting bird flies out, captures it and returns to a perch (Abele et al. 2004; Gebauer 2004c).

Lewis's woodpeckers also engage in extended insect-catching forays, which are not aimed at a specific prey item (Abele et al. 2004). These flights may last from several minutes to a half an hour during which several insects may be taken before the bird returns to a perch or nest cavity (Abele et al. 2004). Lewis's woodpeckers also glean from tree trunks, branches, bushes, and the ground (Gebauer 2004c).

Lewis's woodpecker take a variety of insect and other invertebrates, including ants, bees, wasps, beetles, mayflies, flies, insect larvae, tent caterpillars, grasshoppers, crickets, butterflies, spiders, and true bugs (Koehler 1983; Winkler et al. 1995; Cooper et al.1998; Abele et al. 2004; Gebauer 2004c). They also feed on apples, crabapples, cherries, peaches, serviceberry (*Amelanchier* spp.), hawthorn (*Crataegus* spp.), strawberry (*Fragaria* spp.), raspberry (*Rubus* spp.), dogwood (*Cornus* spp.), juniper (*Juniperus* spp.), chokecherry (*Prunus* spp.), mulberry (*Morus* spp.), pine seeds (*Pinus* spp.), elderberry (*Sambucus* spp.), and sumac (*Rhus* spp.) (Koehler 1983; Cooper et al. 1998; Abele et al. 2004; Gebauer 2004c).

During the fall, the primary diet shifts from insects and other invertebrates to mast and grains (Abele et al. 2004). A large portion of the winter diet for Lewis's woodpecker in oak woodlands is acorns, and significant time is spent storing them (Koehler 1983). Commercial almond and walnut orchards are also preferred winter habitat (Koehler 1983). Unlike the acorn woodpecker (*Melanerpes formicivorus*), the Lewis's woodpecker does not excavate holes to store acorns and other nuts or corn (Abele et al. 2004). Instead, they wedge the food in natural crevices or cracks in the bark of oak or cottonwood trees, as well as cracks in power poles (Koehler 1983; Gebauer 2004c).

Range and Distribution

Lewis's woodpecker are birds of western North America, and their distribution roughly matches that of ponderosa pine in the western United States (Saab and Vierling 2001; Gebauer 2004c). The breeding range extends from southern British Columbia, south through western and southern Montana, southeastern South Dakota, western Colorado, northern New Mexico and Arizona, southern and northern Utah, northern Nevada, central and northern California, most of Idaho, and eastern Oregon and Washington (Sibley 2000; Abele et al. 2004). Within this over-all range, Lewis's woodpeckers are irregularly distributed in appropriate habitats (Abele et al. 2004).

Most Lewis's woodpeckers in the northern half of their breeding range, north of southern Oregon, central Utah, and central Colorado, are migratory; those that nest in the southern half are year-round residents (Abele et al. 2004). They may winter in Yakima and Klickitat counties in Gary oak groves, if mast production is sufficient (Husak 2005), and in the southern Okanogan Valley in British Columbia (Gebauer 2004c). The wintering range extends the nesting range south to northern Baja and Mexico (Gebauer 2004c).

In Washington, Lewis's woodpeckers are found along the eastern slopes of the Cascade Mountains from the Columbia River north to the Canadian border and in a band along the Columbia River to the Canadian border, along the Spokane River and in northern Spokane County (Husak 2005). A small population may still exist in Asotin County on the slopes of the Blue Mountains (Smith et al. 1997). Lewis's woodpeckers were historically fairly common in western Washington, but there are no recent nesting records (Smith et al. 1997; Lewis et al. 2004).

Lewis's woodpeckers nest in Chelan, Klickitat, Kittitas, Lincoln, Okanogan, and Yakima counties (Husak 2005; Opperman et al. 2006). They probably nest in Grant County and possibly nest in Spokane, Pend Oreille, Ferry, and Douglas counties (Husak 2005).

Douglas County Range

In Douglas County, appropriate habitat is limited to riparian areas along the Columbia River, along small streams such as Douglas Creek, in the bottoms of draws and canyons, and in forested areas on Badger Mountain. A pair of Lewis's woodpeckers was observed during the nesting season along lower Moses Coulee in the spring of 1992 and 1995 (Smith et al. 1997). Figure J-10 displays the Habitat Suitability Index for potential habitats in Douglas County.

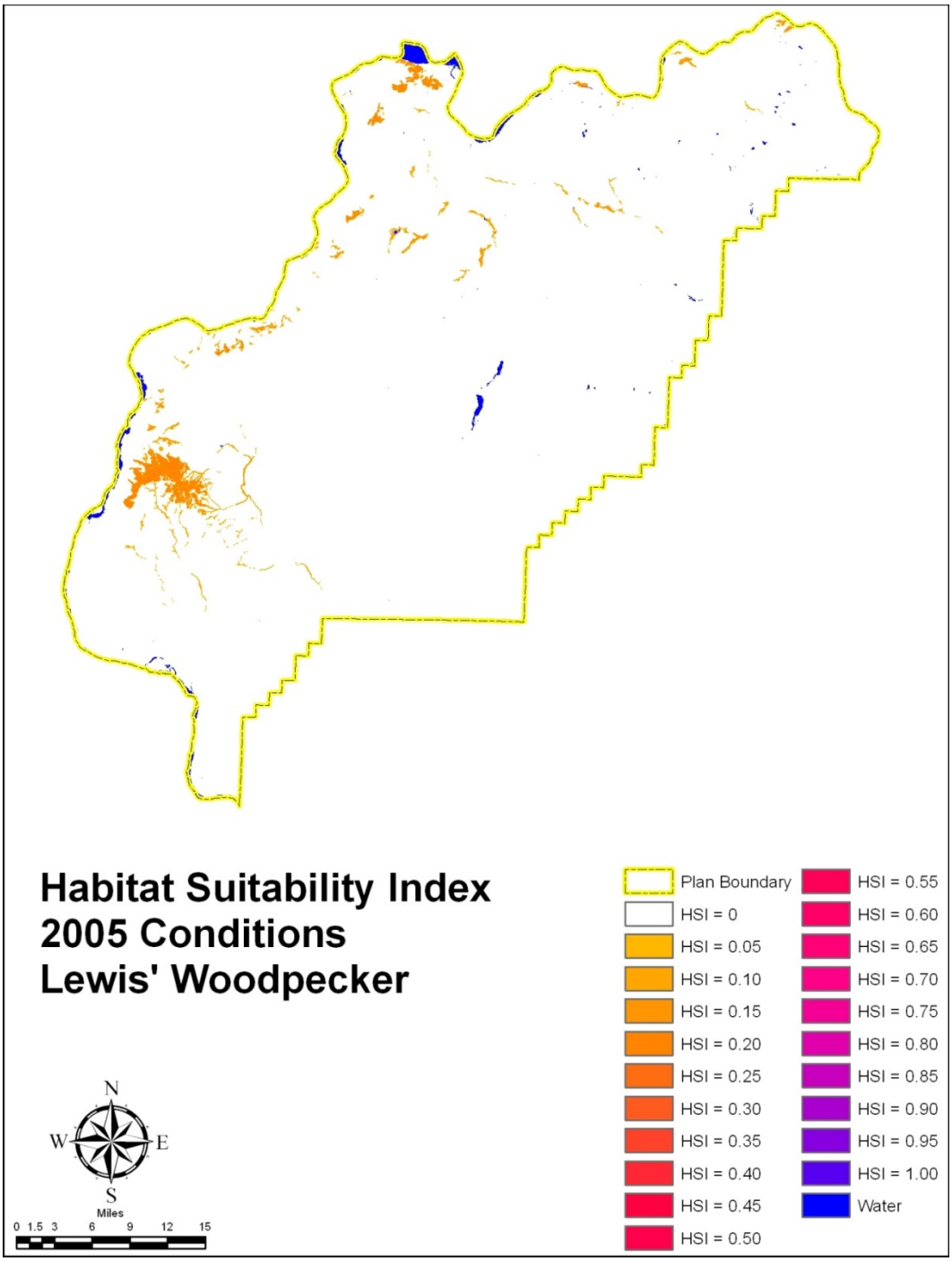


Figure J-10: Habitat Suitability Index 2005 Conditions, Lewis's Woodpecker

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Population Status

Breeding Bird Survey data suggests that Lewis's woodpecker populations are decreasing across their range. There was an annual 2.3 percent decline between 1966 and 1999 across North America (Gebauer 2004c). The annual decline was 2.2 percent across the western United States, 5.2 percent in Montana, and 8.4 percent in Washington (Gebauer 2004c). Saab and Rich (1997) listed the Lewis's woodpecker as a species of high management concern for the Interior Columbia River Basin.

Predators

There has been limited research on causes of mortality of Lewis's woodpecker, although predation is the major cause of nest failure (Cooper et al.1998; Saab and Vierling 2001). Nest predation by black bears (*Ursus americanus*) and common raven (*Corvus corax*) has been documented (Abele et al. 2004). Potential nest predators include weasels (*Mustela* spp.), chipmunks (*Neotamias* spp.), bull snakes (*Pituophis melanoleucus sayi*), raccoon (*Procyon lotor*), fox squirrel (*Sciurus niger*), red squirrel (*Tamiasciurus hudsonicus*), northern flying squirrel (*Glaucomys sabrinus*), Abert's squirrel (*Sciurus aberti*), and black-billed magpie (*Pica pica*) (Saab and Vierling 2001; Abele et al. 2004).

American kestrels (*Falco sparverius*) are known to take young birds just out of the nest, while Cooper's hawks (*Accipiter cooperi*) and sharp-shinned hawks (*Accipiter striatus*) target adults (Abele et al. 2004). Merlins (*Falco columbarius*), and prairie falcons (*Falco mexicanus*) are also potential avian predators (Cooper et al. 1998). In addition, Lewis's woodpecker feathers have been reported in regurgitated pellets of red-tailed hawks (*Buteo jamaicensis*) (Abele et al. 2004).

Loggerhead Shrike (*Lanius ludovicianus gambeli*)
Status: Federal-Species of Concern; State-Candidate

The taxonomy of loggerhead shrikes is in a state of flux. There are currently 10 recognized subspecies. This account will only deal with *Lanius ludovicianus gambeli*, which inhabits much of the region west of the Rocky Mountains, including Washington (Keinath and Schneider 2005).

Physical Description

The loggerhead shrike is a medium-sized, predatory, passerine bird with a length of 8-10 inches and a weight of 1.4 to 1.8 ounces (Pruitt 2000; Sibley 2000; Keinath and Schneider 2005). It is basically black, white, and grey in over-all color, with a large head that is out of proportion to its body (Keinath and Schneider 2005). The top of the head, back, and rump are grey, while the

throat is white (Sibley 2000). The top of the wings and tail are black, with white wing patches and tail corners (Sibley 2000). A black band extends from behind each eye to the bill, and around the forehead, creating a "masked" appearance (Keinath and Schneider 2005). The breast is white or greyish-white, and male and female are similar in appearance (Pruitt 2000; Keinath and Schneider 2005). The underwings are greyish, with white wing patches, and dark grey flight feathers (Sibley 2000). Juveniles tend to have more brownish upperparts, are paler, and noticeably barred overall (Pruitt 2000). The bill is black and hooked, with tomial teeth that allow loggerhead shrikes to prey on vertebrate species (Keinath and Schneider 2005). Due to its broad range, color variations exist based on geography and subspecies (Keinath and Schneider 2005).

Habitat Requirements

Across their range and throughout their annual cycle, loggerhead shrikes are associated with a wide variety of open habitats, including native and non-native grasslands, shrub-steppe, sage scrub, fencerows or shelterbelts, old orchards, riparian areas, open woodlands, farmsteads, suburban areas, abandoned railroad rights-of-way, reclaimed strip mines, and other areas with bare ground and a scattering of trees or shrubs (Dechant et al. 1998; Pruitt 2000; Keinath and Schneider 2005; Wiggins 2005; WDFW 2012). The four primary habitat characteristics necessary for nesting habitat include 1) scattered trees, shrubs, or low bushes for nesting platforms, 2) elevated perches for hunting and courtship activities, 3) foraging areas comprised of open, short vegetation and some bare ground, and 4) thorny trees or shrubs or barbed wire fences for impaling prey (Pruitt 2000; Wiggins 2005).

Across much of mid-western and eastern portions of their range, loggerhead shrikes commonly nest in agricultural areas, primarily in association with pastures and hayfields, although they may also nest in urban/suburban habitats (Pruitt 2000). In some circumstances, suitable habitat can include numerous anthropogenic features, including pastures with fencerows, mowed roadsides, cemeteries, old orchards, and golf courses (Keinath and Schneider 2005).

In the western United States, loggerhead shrikes normally nest in short-grass prairie, pinyon-juniper woodlands, desert shrub, or shrub-steppe (Pruitt 2000; Keinath and Schneider 2005). In general, habitat requirements in winter are similar to nesting habitat. Non-migratory populations may occupy the nesting territory year-round (Dechant et al. 1998).

Foraging habitat of loggerhead shrikes tends to be more open than nesting habitat and contains a variety of high perches from which they can hunt (Keinath and Schneider 2005). Foraging areas typically have areas of low vegetation (short to medium grasses, forbs, or bare ground) interspersed with shrubs or short trees (Dechant et al. 1998; Pruitt 2000; Keinath and Schneider 2005).

In Washington, loggerhead shrikes prefer relatively intact shrub-steppe in the open sagebrush community, with patches of grassy areas (Wahl 2005). Core habitat zones include shrub and shrub savanna in big sage/fescue, central arid steppe, canyon grassland, bitterbrush, and three-tip

sage communities (Smith et al. 1997). Surveys in Eastern Washington shrub-steppe indicated loggerhead shrikes favored deep, sandy soil communities (Vander Haegen et al. 2000). On the Hanford National Monument, loggerhead shrikes preferred sagebrush/bunchgrass habitat with 11-20 percent sagebrush cover and 25 percent bare ground (Eanst and Holmes 2012). Poole (1992) reported that loggerhead shrikes at Hanford National Monument were rare or absent in grasslands, riparian zones, and areas dominated by rabbitbrush and cheatgrass.

Nesting

Isolated shrubs or trees or clump of trees are preferred nesting sites for loggerhead shrikes, rather than continuous lines of trees such as hedgerows or windbreaks (Pruitt 2000). Shrubs and trees with thorns are preferred, presumably for the increased protection afforded (Dechant et al. 1998; Keinath and Schneider 2005). Across its broad range, loggerhead shrikes nest in a wide variety of trees and shrubs, including hawthorns, clematis, red cedar, osage orange, limber pine, Russian olive, sagebrush, bitterbrush, greasewood, spiny hopsage, cabbage palms, blackberry, hackberry, Chinese elm, lemonade berry, Catalina cherry, and toyon (Dechant et al. 1998; Vander Haegen 2004c; Keinath and Schneider 2005). If suitable sites are not present, they have been known to nest in hardwood debris, tumbleweeds, and brush piles (Keinath and Schneider 2005).

Loggerhead shrikes nested predominately (97 percent) in shrubs on the Hanford National Monument, with a few in trees (2 percent) and one in tumbleweeds (Poole 1992). In Idaho, they nested in sagebrush, bitterbrush, greasewood, saltbrush, and rabbitbrush at lower elevations and juniper and mountain mahogany at higher elevations (Keinath and Schneider 2005).

Loggerhead shrikes are highly territorial during the nesting season and will vigorously defend their nesting territory from intruding members of their species (Keinath and Schneider 2005; WDFW 2012). Nesting territories are rather large for a bird of this size, with a range of 5 to 84 acres, although 15 to 22 acres are more common (Dechant et al. 1998; WDFW 2012).

Nests are built in shrubs or trees with dense foliage and/or thorns that provide good concealment and protection (Dechant et al. 1998; Keinath and Schneider 2005; Wiggins 2005). Nests are placed as low as 2.5 feet above ground, but are more commonly 7 to 12 feet above ground level (Pruitt 2000; Keinath and Schneider 2005).

The nest itself is constructed with pieces of vegetation, including rootlets, twigs, forbs, and bark, with a cup lining of flowers, annuals, lichens, grasses, moss, feather, fur cattle hair, string, and cloth (Keinath and Schneider 2005). Nests are typically placed in the crotch of a tree or shrub. However, they are sometimes placed on top of old shrike nests or over that of other species, including northern mockingbird or black-billed magpie (Pruitt 2000). Nesting territories are often reoccupied in successive years (Poole 1992; Pruitt 2000; Wiggins 2005).

On the Hanford National Monument, loggerhead shrikes initiated nesting activities in March, with egg-laying starting on 26 March and first young fledging on 6 May, although it is generally

later in other northern portions of their range (Poole 1992; Wiggins 2005). On the Yakima Training Center, Leu and Manuwal (1996) reported egg-laying began on 1 April in 1993 and 20 March in 1994. Across its broad range, the average clutch size is 5.4, but can vary from one to nine (Keinath and Schneider 2005). Loggerhead shrikes will re-nest after nest failure, and some will produce second broods. Although rare, three broods have been reported (Poole 1992; Leu and Manuwal 1996; Keinath and Schneider 2005; Collister and Wilson 2007).

Egg incubation is done exclusively by the female and takes 14-20 days (Prescott and Bjorge 1999). The young fledge after 17-21 days, but the young usually remain in the immediate vicinity of the nest for 2-3 days after fledging (Keinath and Schneider 2005). The adults continue to care for the young for a period of three to four weeks after fledging (Keinath and Schneider 2005). Full independence occurs after 35 to 40 days (Leu and Manuwal 1996).

Diet

Loggerhead shrikes are opportunistic predators. They are primarily insectivorous, but are able to take a wide variety of prey, including small mammals, birds, reptiles, amphibians, and occasionally carrion (Dechant et al. 1998). They are "sit and wait" predators that wait on a perch for potential prey to appear (Pruitt 2000). Hunting perches are an essential component of foraging habitat, and a variety of natural and manmade (power lines, utility poles, fence posts) objects are utilized for this purpose (Pruitt 2000). Most prey is captured on the ground (79-95 percent) while the remainder is captured in the air (5-21 percent) (Keinath and Schneider 2005).

Vertebrate prey is carried back to a perch where it is killed with a bite to the back of the head with the tomial teeth (Pruitt 2000). Due to their weak feet, loggerhead shrikes impale or wedge their prey in order to be able to tear off manageable pieces that can be swallowed (Pruitt 2000; Keinath and Schneider 2005). A variety of natural and made-made objects are used for impaling, including thorny plants (hawthorn, cacti), sharp ends of broken branches, and barbed wire; prey can also be wedged into a crevice, forked branch, or crotch (Pruitt 2000; Keinath and Schneider 2005).

Across their range, grasshoppers are the primary prey for loggerhead shrikes during the warmer months (Pruitt 2000; Keinath and Schneider 2005). Overall, insects in general make up the majority of the diet, with vertebrates more often taken during the winter when invertebrates are less available (Prescott and Bjorge 1999; Pruitt 2000; Wiggins 2005). Invertebrate prey includes spiders, grasshoppers, crickets, beetles, termites, butterflies and moths, bees, ants, and earwigs (Leu and Manuwal 1996; Keinath and Schneider 2005). Vertebrate prey recorded includes meadow voles, sagebrush voles, white-footed mice, pocket mice, kangaroo rats, shrews, thirteen-lined ground squirrel, cotton rats, robins, mourning doves, chimney swifts, sparrows, warblers, buntings, finches, northern cardinal, horned lark, side-blotched lizards, gopher snakes, green tree frogs, and spring peepers (Leu and Manuwal 1996; Prescott and Bjorge 1999; Keinath and Schneider 2005).

Range and Distribution

The loggerhead shrike has a very broad range that extends from south-central Canada, south through the United States to southern Mexico and Baja (Wiggins 2005). It is found from coastal California east to the Atlantic coast, from southern Illinois, Indiana, Ohio, and Pennsylvania, south through the Southeast to southern Florida, and west to Oklahoma and Texas. From northern Nevada and southern Idaho, its range extends north through eastern Oregon and Central Washington into south-central British Columbia (Paczek 2004; Wiggins 2005). Loggerhead shrikes are local to rare in Eastern Canada, the Upper Mid-West, and New England (Prescott and Bjorge 1999; Pruitt 2000).

Loggerhead shrikes in the northern part of their breeding range are migratory (WDFW 2012). During the winter, birds north of central coastal California, northern Nevada and Utah, Central Wyoming and Nebraska, and north of Tennessee, move south (Pruitt 2000; Keinath and Schneider 2005;Wiggins 2005). This essentially means that birds that nest in the northern Great Basin, the Rocky Mountains and the Great Plains, Canada, the central mid-West, and any scattered birds in Eastern Canada and New England leave their nesting areas during the winter (Pruitt 2000; Keinath and Schneider 2005). The southern Pacific coast and Atlantic coast of Mexico are exclusively wintering areas for the Loggerhead Shrike (Wiggins 2005).

In Washington, loggerhead shrikes nest in Eastern Washington, primarily in low-elevation shrub-steppe and similar habitat (Wahl 2005; WDFW 2012). Primary nesting areas include along the Columbia River and in the Columbia Basin in Yakima, Kittitas, and Douglas counties (WDFW 2012). Scattered nesting occurs in other areas of eastern and south-eastern Washington and Okanogan County (Wahl 2005; WDFW 2012). They are irregular to rare during winter in south-central Washington from Kittitas County south to the Columbia River, although this is north of their normal winter range (Wahl 2005). There are scattered records from Western Washington during the winter and spring (WDFW 2012).

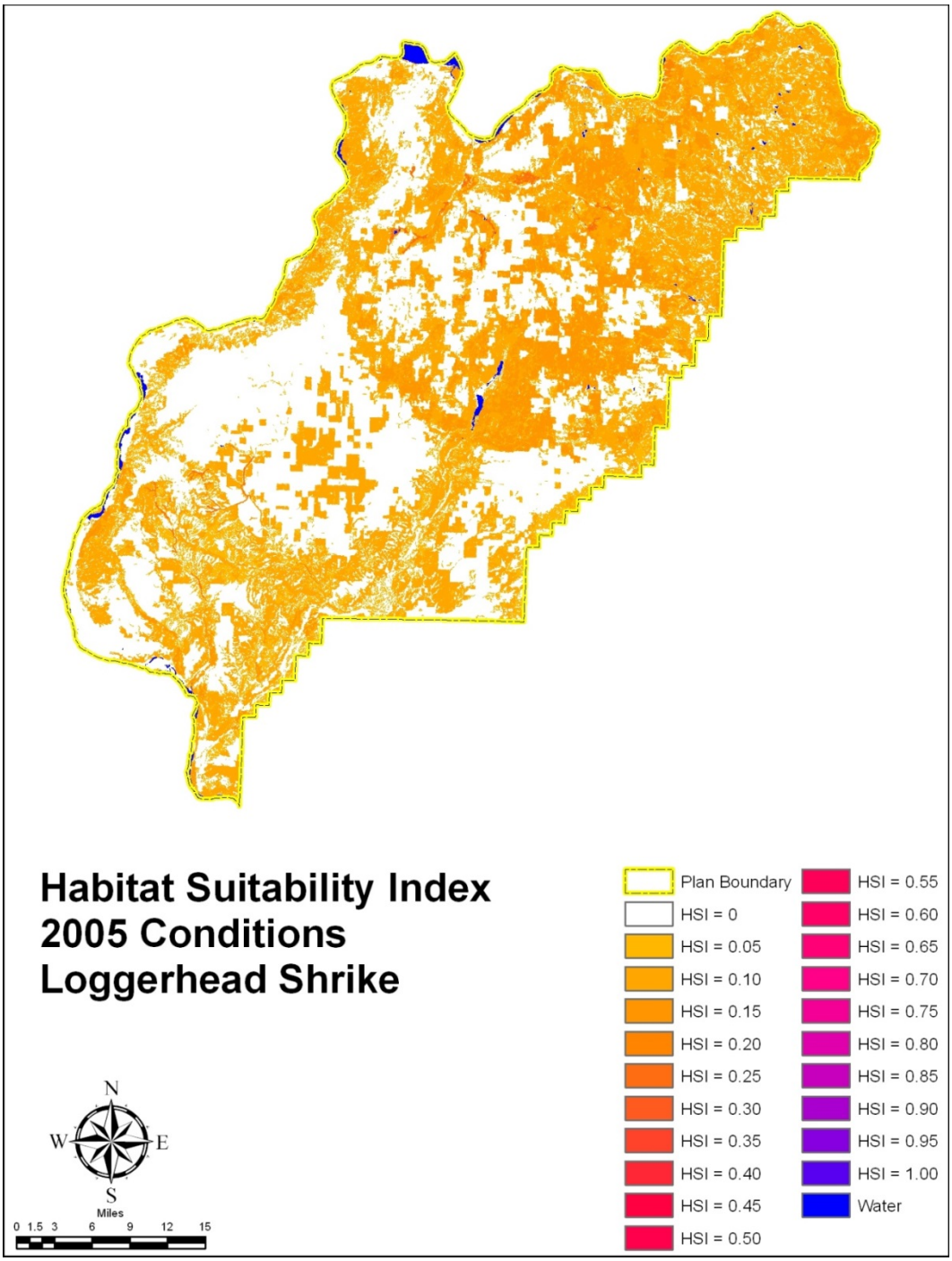


Figure J-11: Habitat Suitability Index 2005 Conditions, Loggerhead Shrike

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Douglas County Range

In Douglas County, loggerhead shrikes inhabit appropriate shrub-steppe habitat. There have been documented nests, particularly in the eastern part of the County (Smith et al. 1997). Core habitat areas include the southern and northeastern portions of the County, Moses Coulee, Dutch Henry Draw, and the western and eastern peripheries of the County (Smith et al.1997). Figure J-11(see previous page) displays the Habitat Suitability Index for potential habitats in Douglas County.

Population Status

Over the last two centuries, the continental range and population of the loggerhead shrike has changed dramatically. Due the clearing of eastern forests for agriculture in the early and mid-19th Century, their range expanded north through the Prairie Provinces, reaching Hudson Bay; east through south-eastern Canada to the Maritimes; and north and east through all of the Upper Mid-West and New England (Prescott and Bjorge 1999). Since maximum distribution was reached in the mid-20th Century, distribution and populations have declined, with range contractions drawing back from the northern limits in Canada, southeastern Canada, New England, the Great Lakes region, and the upper Midwest (Prescott and Bjorge 1999).

Breeding Bird Survey (BBS) data indicates a 4 percent annual decline in continental loggerhead shrike populations between 1966 and 1986, with the most severe declines in central, mid-Western, and northeastern states (Keinath and Schneider 2005). Additional analyses of BBS data indicated an annual decline of 2.9 percent from 1966 to 1991, and an annual decline of 3.7 percent between 1966 and 1998 (Pruitt 2000; Keinath and Schneider 2005). BBS data showed an annual decline of 1.7 percent across western North America between 1966 and 2009 (WDFW 2012).

In Oregon, BBS data indicates an annual decline of 2.7 percent between 1966 and 1999 (USFWS 2004). BBS data for the Interior Columbia Basin indicated an annual decline of 2.7 percent between 1968 and 1994, and an annual decline of 2.4 percent between 1968 and 2001 (Dobkin and Sauder 2004; Saab and Rich 2007). BBS data for Washington suggests an annual decline of 3.7 percent for that period, but small sample size may affect the reliability of this conclusion (Wahl 2005; WDFW 2012). Saab and Rich (1997) designated the loggerhead shrike a species of high concern in the Interior Columbia Basin.

Analysis of Christmas Bird Count (CBC) data indicated that winter populations, like breeding populations, are declining; CBC data revealed an annual decline of 1.7 percent from 1959 to 1988 (Pruitt 2000). Decreases were recorded across the country, but were particularly steep in the East (Pruitt 2000).

Predation

Predation is generally the leading cause of nest failure. Poole (1992) reported that most—93 percent—of nest failures on the Hanford National Monument were caused by depredation while abandonment accounted for only 7 percent of nest failures. Depredation was due to gopher snakes (*Pituophis melanoleucus*) – 52 percent, corvids (black-billed magpies and common raven) – 33 percent, and coyotes (*Canis latrans*) – 14 percent (Poole 1992). Other predators of eggs and young include feral cats (*Felis silvestris*), badgers (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), least chipmunk (*Tamias minimus*), Townsend's ground squirrels (*Urocitellus townsendii*), sharp-shinned hawks (*Accipiter striatus*), blue jays (*Cyanocitta cristata*), house wrens (*Troglodytes aedon*), black rat snakes (*Elaphe obsolete*), and western rattlesnakes (*Crotalus viridis*) (Wiggins 2005; Collister and Wilson 2007).

The young experience high mortality after fledging, with various studies reporting 46 percent loss during the first week, 33-53 percent during the first 10 days, and 33 percent from fledging to independence (Keinath and Schneider 2005). On the Hanford National Monument Poole (1992) reported a decrease in survivors from 5.1 per nest at fledging to 2.3 survivors per nest two weeks after fledging. Leu and Manuwal (1996) reported median survival to independence of 67 percent in 1993 and 50 percent in 1994 on the Yakima Training Center.

Predation of adults may be significant, but is difficult to document (Pruitt 2000). Raptors may account for significant loss of adults during the winter (Pruitt 2000). Northern harriers, Swainson's Hawks, red-tailed hawks, red-shouldered hawks, swallow-tailed kite, and crested caracara may take adult loggerhead shrikes (Keinath and Schneider 2005).

Willow Flycatcher (*Empidonax traillii adastus*)
Status: Federal Status-None; State Status-None

The taxonomy of the willow flycatcher has changed over the past 40 years and is still in a state of flux. Currently, there are either four or five subspecies recognized, depending on the source (Craig and Williams 1998; Sogge et al. 2010). To confuse matters more, sources do not agree as to which subspecies occur in Eastern Washington. Mlodinow (2005) states that "Some birds in eastern Washington possibly *adastus*," while Smith et al. (1997) states "Washington breeders are representative of the western subspecies *E.t. brewsteri*." However, both Dobkin and Sauder (2004) and Sogge et al. (2010) show the distribution of *E.t. adastus* from southern British Columbia to southern Utah and Nevada, east of the Cascades/Sierras to the Continental Divide, while *E.t. brewsteri* is a coastal subspecies found west of the Cascades/Sierras. This account will only deal with *E.t.*

adastus, even though the author agrees with Dobkin and Sauder (2004) that "The current distribution of *E.t. adastus* is not well understood."

Physical Description

The willow flycatcher is a small grayish to brown and white bird from 4.75 to 6.75 inches in length and with a weight of .5 ounces (Klott 1997; Sibley 2000). The back and head are greyish to olive-brown and the breast is light-grey (Klott 1997; Sibley 2000). The throat is white to light yellow; the belly is white, while the flanks washed with grey (Klott 1997; Sibley 2000). The tail is dark grey to brown, and the wings are dark brown with white, buff, or light yellow wing bars (Klott 1997; Sibley 2000). Willow flycatchers are difficult to distinguish from other members of the genus *Empidonax*.

Habitat Requirements

Willow flycatchers inhabit areas near water with dense deciduous thickets, riparian areas, clear-cuts, pond and lake edges and swamps with alder, willow, dogwood, or wild rose (Mlodinow 2005). Nesting territories typically include some surface water or saturated soil during the early part of the nesting season (Sanders and Flett 1989; Bombay et al. 2000). As their name implies, willow flycatchers tend to be closely associated with willow riparian zones in most areas, although they can also be found along the edges of mountain meadows, in scattered shrub thickets, in dry brush uplands, and along open woodland margins (Klott 1997; Kulba and McGilivray 2001; Dobkin and Sauder 2004). Stepniewski (1999) noted that the willow flycatcher is a bird of alder and willow thickets along the east slopes of the Cascade Mountains and in riparian zones at lower elevations. Sogge and Sferra (2010) listed a number of vegetation communities utilized by willow flycatchers in Washington and Oregon, including deciduous growth around brushy lowlands and borders of clearings, wooded stream bottoms with shrubby growth, willow thickets along stream-sides and lakes, woodland edges, young alder forests, tall brush at the edges of fields, riparian hawthorn stands, and upland prairie remnants with hawthorn, rose, or Prunus spp. A wide range of deciduous plant species form the shrub layer, including willow, alder, hawthorn, dogwood, rose, elderberry, and Prunus ssp. (Harris 1997).

Nesting

Stepniewski (1999) states that the willow flycatcher is among the latest migrants to arrive at its nesting areas in Washington, rarely recorded before the last week in May. However, Mlodinow (2005) noted that they may be arriving earlier in recent years, with some individuals recorded in late April. *E.t. adastus* constructs a cup nest in a vertical, horizontal, or angled fork low in a shrub or a small tree. Small branches can be woven into the nest (Craig and Williams 1998). The nest is usually located at a height of 3-18 feet, but can be as low as 1.25 feet (Craig and Williams 1998; Bombay et al. 2000; Green et al. 2003). Nests are commonly placed in willows (*Salix* spp.), but other plants may be used, including aspen, alder, blackberry, mountain alder, and mountain mahogany (Bombay et al. 2000). King (1955) reported that 36 percent of nests in

his study in the Palouse Hills were placed in wild rose (*Rosa* spp.) in what he termed "upland prairie remnants." Nests are constructed of sedges, grasses, bark, forbs, and weed stems, are lined with softer material, including fine grass, cattail down, cottonwood, willow, and milkweed down, nettle fibers, feathers, deer and horse hair, sheep wool, string, paper, and plastic bags (Sanders and Flett 1989; Klott 1997; Craig and Williams 1998; Green et al. 2003).

Willow flycatchers begin egg-laying in mid-June and normally lay two to four (three to four the norm) eggs which hatch after an incubation period of 12-15 days. The female performs all of the incubation (Sanders and Flett 1989; Bombay et al. 2000; Green et al. 2003). Both male and female feed the young (Sanders and Flett 1989). Nestlings fledge at 12-15 days of age, but remain in close proximity to the nest for three to five days (Bombay et al. 2000). Young stay in the vicinity of the nest for approximately two weeks and possibly longer (Bombay et al. 2000). Double brooding is documented in *E.t. extimus* in the southwestern United States but is unknown in *E.t. brewsteri* and *E.t. adastus* (Bombay et al. 2000; Green et al. 2003). Willow flycatchers will re-nest if a clutch is destroyed (third attempts have been documented), sometimes using the original nest for the re-nesting attempt (Bombay et al. 2000; Green et al. 2003; Soroka and Morrison 2006). They are also known to disassemble a failed nest and utilize the material to construct the new nest (Bombay et al. 2000). Re-nesting may result in egg-laying occurring in late July or early August (Green et al. 2003). Adult willow flycatchers may return to the same nesting areas in subsequent years (Soroka and Morrison 2006). Willow flycatcher nests are highly susceptible to parasitism by brown-headed cowbirds, which is a major cause of nesting failure (Craig and Williams 1998; Green et al. 2003)

Diet

Willow flycatchers feed almost exclusively on insects, although arachnids and berries are occasionally consumed (Klott 1997; Bakian 2011). They primarily forage on the wing. Their two foraging techniques are "hawking," which is sallying from an open perch to catch a flying insect, or gleaning on the wing, which is picking an insect off vegetation (Sanders and Flett 1989). Hawking may be more frequent in the mountains, while gleaning is more common at lower elevations (Craig and Williams 1998).

Species of the Hemiptera (true bugs), Hymenoptera (bees and wasps), Diptera (flies), and Coleoptera (beetles) families provide much of the diet for willow flycatchers (Sogge et al. 2010; Bakian 2011). Other taxa in the diet include Homoptera (leafhoppers), Odonata (dragonflies), Lepidoptera (butterflies and moths), Orthoptera (grasshoppers), Arachnida (spiders), and Pseudoscorpionida (Craig and Williams 1998; Sogge et al. 2010; Bakian 2011). Elderberry and blackberries have been identified as part of the diet of willow flycatchers (Craig and Williams 1998). The diet of adult willow flycatchers may differ from that fed to nestlings. In one study in Utah, aquatic insects comprised approximately one-third of the diet of adult birds, but only 13 percent of the diet of juveniles (Bakian 2011).

Range and Distribution

The willow flycatcher is a neo-tropical migratory bird that nests in North America and winters in southern Mexico to northern South America. The breeding range extends from southern Canada south to northern Mexico, with the exception of the southern Great Plains and the Southeast United States. The winter range of the willow flycatcher extends from the West Coast of Mexico south through Central America to Northern South America (Sogge et al. 2010).

In Western Washington, the willow flycatcher is common in wetlands, clear-cuts, and shrubby areas at lower elevations. It is uncommon from the Olympic Peninsula south to the Columbia River (Smith et al. 1997). The willow flycatcher is uncommon in forested areas of Eastern Washington and rare across the Columbia Basin (Smith et al. 1997; Mlodinow 2005). Willow flycatchers in Western Washington are members of the *E. t. brewsteri* subspecies , while those east of the Crest of the Cascade Mountains are presumed to be members of the *E.t. adastus* (Dobkin and Sauder 2004; Sogge et al. 2010).

Douglas County Range

In Douglas County, willow flycatcher habitat is limited to areas along the Columbia River, riparian areas along small streams, including Douglas Creek, Foster Creek, Central Ferry Canyon, McCartney Creek, and the forested areas of Badger Mountain (Smith et al. 1997; Mlodinow 2005). Willow flycatchers have been recorded along West Foster Creek, Central Ferry Canyon, McCartney Creek, and Douglas Creek (call Mike Schroeder; observations in June and July, D. Stevens personal communication via telephone with L. Robb, 2003). Figure J-12 displays the Habitat Suitability Index for potential habitats in Douglas County.

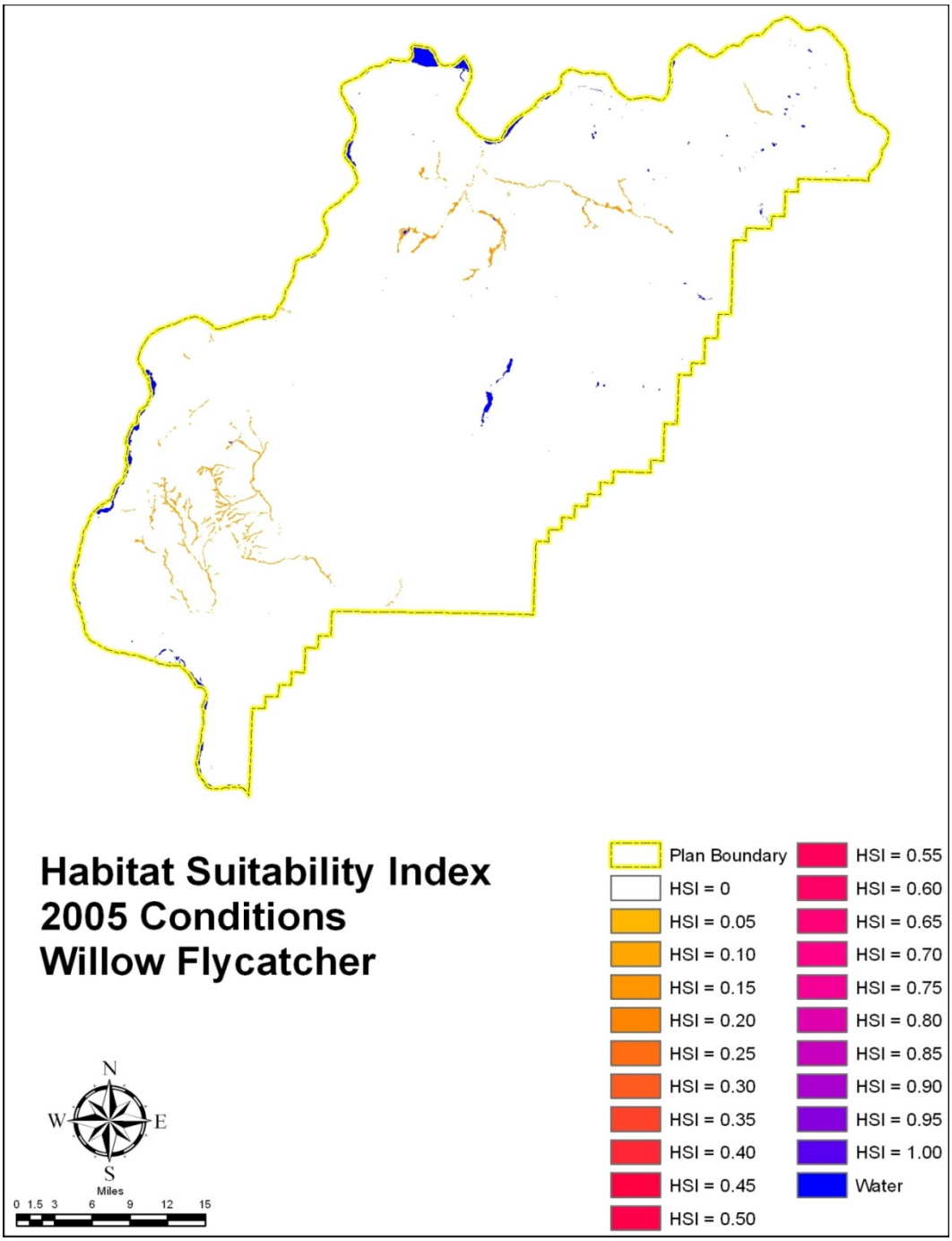


Figure J-12: Habitat Suitability Index 2005 Conditions, Willow Flycatcher

Note: The HSI map analyzed potential habitat throughout the county, not just in the species' most likely range.

Population Status

Willow flycatcher populations have declined significantly across much of their continental range over recent decades (Klott 1997; Green et al. 2003; Mathewson et al. 2012). (The southwestern willow flycatcher, *E.t.extimus*, was listed as an Endangered Species by the USFWS in 1995 [Green et al. 2003].) Between 1966 and 1996, *E.t.adastus* declined 2.5 percent annually in Eastern Washington and Oregon, and 2.3 percent annually in the western region (Green et al. 2003). Based on BBS data, the willow flycatcher population has declined at an annual rate of 1.9 percent between 1968 and 2001 across the Western BBS region, and declined at an annual rate of 6.2 percent across the Columbia Plateau (Saab and Rich 1997). Saab and Rich (1997) list the willow flycatcher as a species of high concern in the Interior Columbia River Basin. The willow flycatcher is listed as a focal species in the *Conservation Strategy for Landbirds in the Columbia Basin*, prepared by Oregon-Washington Partners in Flight (Washington Steering Committee-Intermountain West Joint Venture 2005). The willow flycatcher is listed as a Species of Conservation Concern by the USFWS in Bird Conservation Regions 5 (Western Washington), 9 (Columbia Basin), and 10 (Blue Mountains and Northeast Washington) (USFWS 2008).

Predation

There is sparse information concerning predation of adult willow flycatchers. Predation by aerial predators that target small birds, including all three accipiter species *(A. striatus, A. cooperii, A. gentilis*), and American kestrels (*Falco sparverius*) presumably occurs (Green et al. 2003). Predation may be the primary cause of nest failure, but little is known about which specific species may be involved (Green et al. 2003; Mathewson et al. 2012). Documented nest predators include milk snake (*Lampropeltis triangulum*), common kingsnake (*Lampropeltis getulus*), red-tailed hawks (*Buteo jamaicensis*), and Cooper's hawks (*A. cooperii*) (Green et al. 2003). Likely predators include deer mice (*Peromycus maniculatus*), house wren (*Troglodytes aedon*), short-tailed weasels (*Mustela ermine*), long-tailed weasels (*M. frenata*), Douglas squirrels (*Tamiasciurus douglasii*), chipmunks (*Tamias* spp.). accipiters (*Accipiter* spp.), Clark's nutcracker (*Nucifraga columbiana*), Steller's jay (*Cyanocitta stellei*), and garter snakes (*Thamnophis* spp.) (Green et al. 2003; Mathewson et al. 2012).

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Appendix J: Literature Cited

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Acknowledgements:

Rewritten and updated by:

Bob Tuck
Eco-Northwest
Selah, Washington 98942

Edited and formatted by:

Christy Peterson
Cascade Creative Services
Vancouver, Washington 98682

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