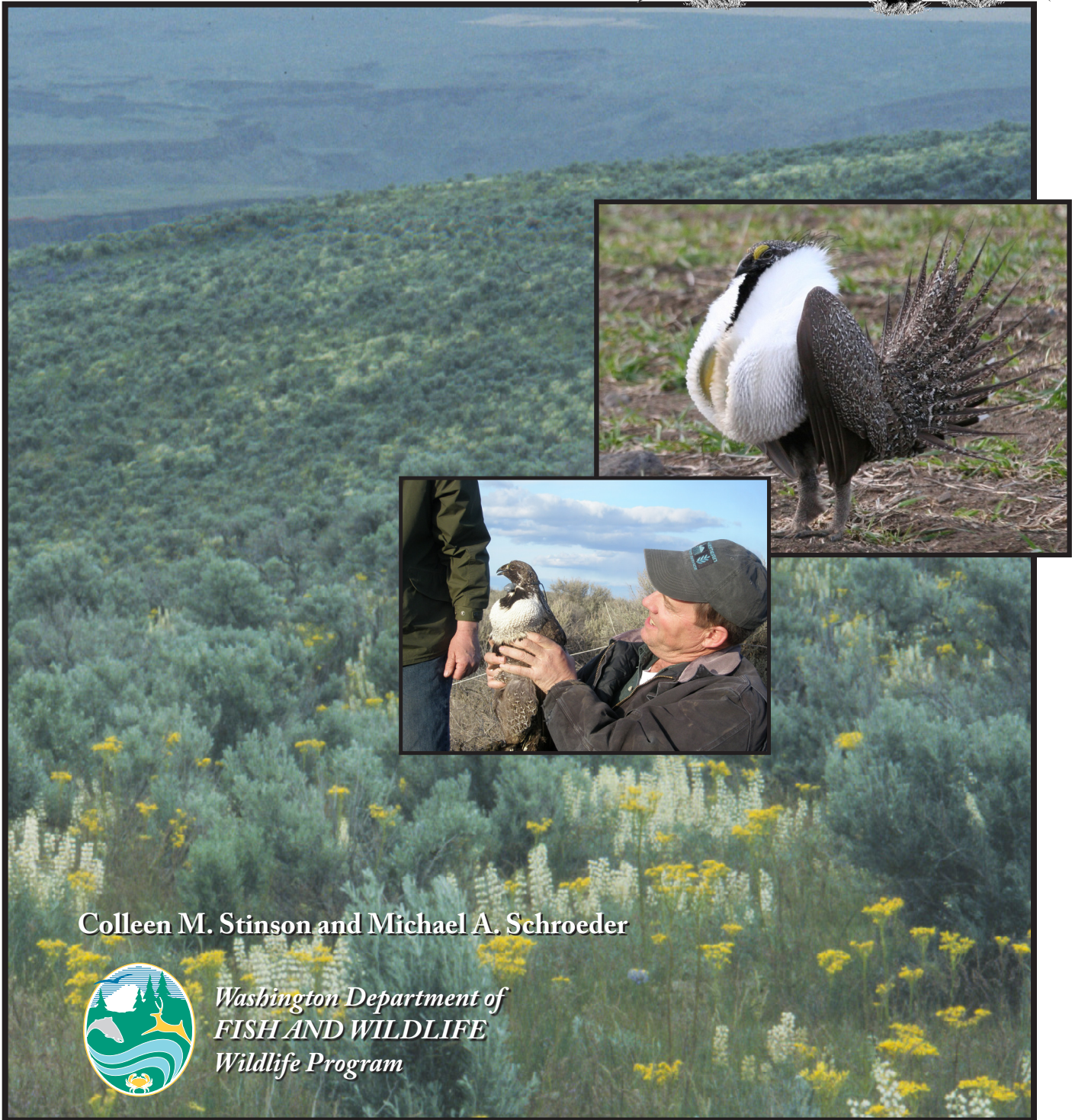


# Sage-grouse Conservation in Washington: 2013



Colleen M. Stinson and Michael A. Schroeder



*Washington Department of  
FISH AND WILDLIFE  
Wildlife Program*

Citation:

Stinson, C. M., and M. A. Schroeder. 2014. Sage-grouse conservation in Washington: 2013. Wildlife Program, Washington Department of Fish and Wildlife, Olympia, Washington.

*Cover: Male grouse in Douglas County and background photo by Mike Schroeder;  
Mike Finch (holding bird) by Jason Lowe;  
Title page and cover illustration by Darrell Pruett.*

# Table of Contents

ACKNOWLEDGEMENTS .....	iv
ACRONYMS .....	v
BACKGROUND AND PURPOSE.....	1
CURRENT STATUS .....	2
SAGE-GROUSE MANAGEMENT UNITS .....	3
CONSERVATION STRATEGIES AND TASKS.....	5
1. Inventory and monitor the sage-grouse population in Washington.....	5
2. Protect sage-grouse populations .....	6
3. Enhance existing populations and re-establish additional populations.....	14
4. Protect sage-grouse habitat on public lands.....	16
5. Work with landowners to protect the most important sage-grouse habitat on private land .....	28
6. Facilitate and promote the use of incentives, such as Farm Bill conservation programs, to benefit sage-grouse.....	30
7. Facilitate management of agricultural and rangelands that is compatible with the conservation of sage-grouse .....	33
8. Restore degraded and burned sage-grouse habitat within Sage-Grouse Management Units .....	36
9. Conduct research necessary to conserve sage-grouse populations .....	39
10. Cooperate and coordinate with other agencies and landowners in the conservation, protection, and restoration of sage-grouse in Washington .....	40
11. Develop public information materials and educational programs for landowners, schools, community organizations, and conservation groups as needed .....	42
REFERENCES .....	43
PERSONAL COMMUNICATIONS .....	48

LIST OF TABLES AND FIGURES

Table 1. Powerlines and poles removed in Lincoln County ..... 13

Table 2. Fence removed, marked or burned in Lincoln and Douglas Counties, 2010 to 2012..... 13

Table 3. Greater sage-grouse released in the Yakima Training Center Sage-grouse  
Management Unit..... 15

Table 4. Greater sage-grouse released in the Crab Creek Sage-grouse Management Unit,  
(Swanson Lakes Wildlife Area, Lincoln County) ..... 15

Table 5. Habitat enrolled in CRP and SAFE in occupied management units in Washington..... 31

Table 6. Sage-grouse Initiative sign-up in Washington 2010 to 2013 ..... 32

Table 7. Restoration of degraded sage-grouse habitat in Washington ..... 37

Figure 1. Male greater sage-grouse on lek in Douglas County ..... 1

Figure 2. Statewide population estimate for sage-grouse in Washington 1982 to 2013 ..... 2

Figure 3. Estimates for three populations of sage-grouse in Washington 1980 to 2013..... 3

Figure 4. Sage-grouse management units in Washington ..... 4

Figure 5. Sign posted at Swanson Lakes Wildlife Area..... 11

Figure 6. National sage-grouse priority areas for conservation (PACs) ..... 17

Figure 7. Linkage model for sage-grouse for the (a) WHCWG statewide and (b) Columbia Plateau  
Ecoregion connectivity analyses ..... 18

## ACKNOWLEDGEMENTS

Several individuals provided comments and information that greatly improved this report, including: Penny Becker, Leslie Robb, Derek Stinson, John Cotton, Jeff Burnham, Jason Lowe, Heidi Newsome, Dan Peterson, Colin Leingang, and numerous others who responded to requests for information on short notice. Joanne Schuett-Hames and Leslie Robb were invaluable in contributing to the connectivity information in the report. Derek Stinson provided assistance with figures and tables and Brian Hall provided GIS assistance.

## Acronyms

ALI – Arid Lands Initiative	NEPA – National Environmental Policy Act
BLM – Bureau of Land Management	NIETC – National Interest Electric Transmission Corridor
BMPs – Best Management Practices	NRCS – Natural Resources Conservation Service
BPA – Bonneville Power Administration	PHS – Priority Habitat and Species
CAO – Critical Areas Ordinance	PGH – Preliminary General Habitat
CCAA – Candidate Conservation Agreement with Assurances	PPH – Preliminary Priority Habitat
COT – Conservation Objectives Team	SAFE – State Acres for Wildlife Enhancement
CRM – Coordinated Resource Management	SEPA – State Environmental Policy Act
CRP – Conservation Reserve Program	SGPA – Sage-grouse Protection Area
CWPP – Community Wildfire Protection Plan	SGTF – Sage-grouse Task Force
DNR – Department of Natural Resources	SLWA – Swanson Lakes Wildlife Area
DPS – Distinct Population Segment	TNC – The Nature Conservancy
EFSEC – Energy Facility Site Evaluation Council	UGA – Urban Growth Area
EPA- Environmental Protection Agency	USFWS – United State Fish and Wildlife Service
EQIP – Environmental Quality Incentives Program	WDFW – Washington Department of Fish and Wildlife
ESA – Endangered Species Act	WHCWG – Washington Habitat Connectivity Working Group
FCCD – Foster Creek Conservation District	WHIP – Wildlife Habitat Incentives Program
FSA – Farm Services Agency	WSU – Washington State University
FWHCA – Fish and Wildlife Habitat Conservation Area	WSSWG – Washington Shrub-steppe Working Group
GCP – General Conservation Plan	WUI – Wildland Urban Interface
GIS – Geographic Information System	WWRP – Washington Wildlife and Recreation Program
GMA – Growth Management Act	YN – Yakama Nation
GNLCC – Great Northern Land Conservation Cooperative	YTC – Yakima Training Center
GRP – Grasslands Reserve Program	
HCA – Habitat Concentration Area	
MGL - Molecular Genetic Laboratory	



## Background and Purpose

The greater sage-grouse (*Centrocercus urophasianus*, Figure 1) is the largest North American grouse species. Historically, greater sage-grouse were distributed throughout much of the western United States in 13 states and along the southern border of three western Canadian provinces. Currently, greater sage-grouse occur in 11 states and two provinces in the western United States and Canada (Stinson et al. 2004).



Figure 1. Male greater sage-grouse on a lek in Douglas County (photo by M. Schroeder).

Greater sage-grouse inhabit shrub-steppe and, as their name implies, are closely associated with sagebrush. Wyoming big sage (*Artemisia tridentata wyomingensis*) and three-tip sage (*Artemisia tripartita*) are the most important sagebrush species to sage-grouse in Washington.

Greater sage-grouse were listed as a threatened species by the state of Washington in 1998. In May 2001, the Washington population of greater sage-grouse also became a Candidate for listing under the federal Endangered Species Act (ESA) when the U.S. Fish and Wildlife Service (USFWS) determined that the greater sage-grouse in Washington constituted a distinct population segment (DPS–50 CFR 17) and that their listing as Threatened was warranted but precluded by higher listing priorities (USFWS 2001). In March 2010 the USFWS determined that the range-wide listing of greater sage-grouse under the federal ESA was warranted but precluded due to higher listing priorities. Consequently, range-wide they are now considered a Candidate species (USFWS 2013).

In 2011, the implications of an ESA listing of greater sage-grouse prompted a meeting between the Secretary of the Interior Ken Salazar and the governors of 11 western states where the species occurs. The purpose of the meeting was to address coordination of conservation of the greater sage-grouse across its range. The primary outcome of the meeting was the formation of a Sage-Grouse Task Force (Task Force) to develop recommendations to: 1) advance a coordinated multi-state, range-wide conservation strategy, 2) ensure the long-term viability of the species, and 3) preclude listing of greater sage-grouse under the Endangered Species Act (ESA). The USFWS, with the backing of the Task Force, created a Conservation Objectives Team (COT) of state and USFWS representatives to define the degree to which threats need to be reduced in order to ensure that the greater sage-grouse was no longer in danger, or likely to become in danger of extinction in the foreseeable future, and thus avoid the need for ESA listing (USFWS 2013).

This report is an update to the greater sage-grouse (hereafter referred to as sage-grouse) distribution and population in Washington State and a progress report on the conservation actions as outlined in the 2004 state recovery plan (Stinson et al. 2004).

## The Decline of Sage-grouse in Washington

Washington's sage-grouse have declined dramatically in both distribution and population size due to conversion of shrub-steppe for production of crops and degradation of the remaining native habitat (Stinson et al. 2004). Sage-grouse were described by Meriwether Lewis in 1806 as being "in great abundance" in parts of present day Benton and Klickitat Counties (Zwickel and Schroeder 2003). Sage-grouse numbers in Washington declined from the late 1800s to the early 1900s because of habitat conversion, overgrazing, and weak hunting regulations (Yocum 1956, Ellison 1960).

Declines and local extirpations continued through the 1980s and despite statewide closure of the sage-grouse hunting season in 1988, the sage-grouse population stayed at low levels or continued to decline (Figure 2); probably due to reduction in habitat, deterioration and fragmentation of the remaining habitat, and isolation and small size of the remaining population (Stinson 2004). Based on changes in number of males counted on leks complexes, the sage-grouse population in Washington declined from 3,800 birds in 1970 to 998 in 2013 (Schroeder et al. 2013c). Of 76 lek complexes documented since 1960, 64% are currently vacant (Schroeder et al. 2013c). Many of these vacant lek complexes (53%) are in areas where sage-grouse have become extirpated since 1960. The sage-grouse was listed as a threatened species by the state of Washington in 1998 when the statewide population was approximately 1,081.

### Current Status

Sage-grouse currently occur in two extant populations and one reintroduced population on approximately 8% of their historical range (Stinson et al. 2004). Birds persist in two relatively isolated areas: one primarily on the U.S.

Army's Yakima Training Center (YTC) in Kittitas and Yakima Counties and the other in Douglas County (Figure 3; Schroeder et al. 2000). A third population is currently being reestablished on WDFW and BLM lands in Lincoln County.

The 2013 spring population was estimated to be about 998 birds (Figure 2), with 221 on the YTC, 712 in

Douglas County, and 65 in Lincoln County (Figure 3). The declines and the isolated nature of these populations were part of the USFWS (2001) assessment of whether sage-grouse in Washington (Columbia Basin population) and northern Oregon represented a DPS and whether the population warranted federal threatened status. Listing of the Columbia Basin population as a DPS was determined to be warranted based primarily on the Columbia Basin as a unique geographic setting and the isolation from the Oregon population, but the listing has been precluded by higher listing priorities.

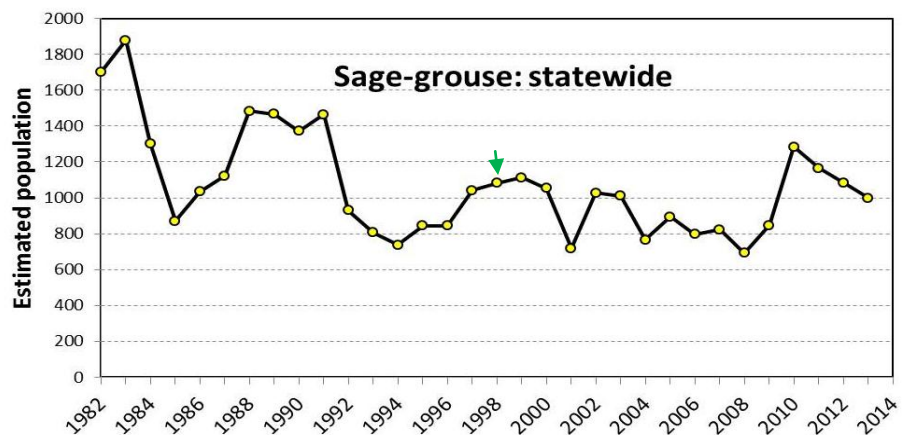


Figure 2. Estimated total population of greater sage-grouse in Washington, 1982 to 2013 (green arrow indicates state listing date).



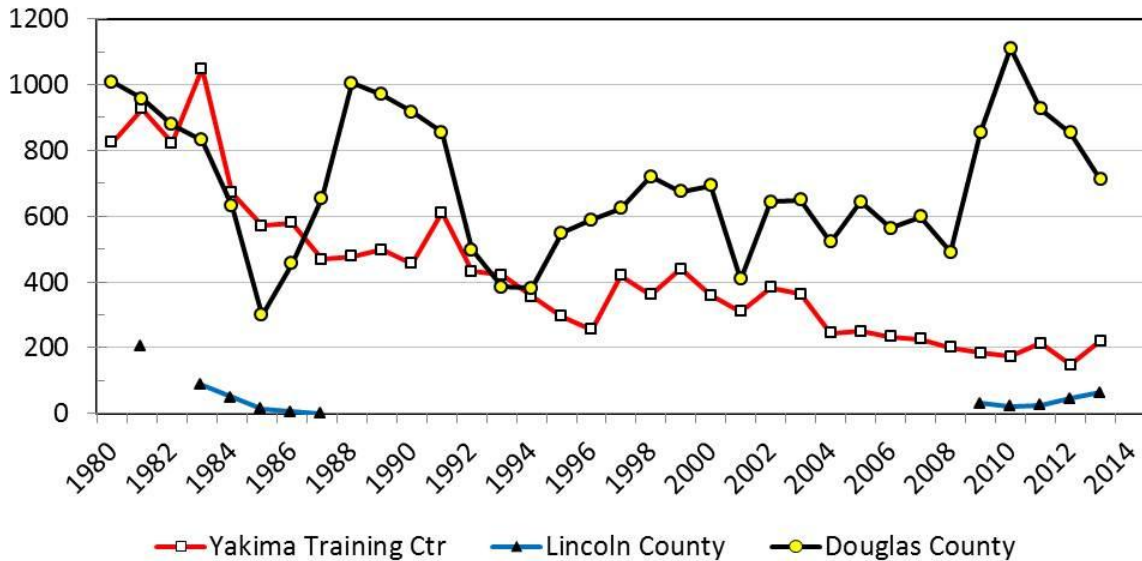


Figure 3. Estimates for three populations of sage-grouse in Washington, 1980 to 2013.

The population centered in Douglas County occupies mostly private lands that are a mosaic of small areas of high-quality shrub-steppe and farmlands enrolled in the federal Conservation Reserve Program (CRP). In 2010, a large lek (65 birds) was discovered on CRP land that was cropland until relatively recently. CRP has allowed the Douglas County population to increase or to remain relatively stable, while the YTC population has continued a downward trend, even though it occupies one of the largest areas (1,300 km<sup>2</sup>) of shrub-steppe remaining in the state (Figure 3) (Schroeder and Vander Haegen 2011).

Military training and wildfires pose the greatest threats to habitat security on the YTC, although some recent changes have made progress towards control of wildfires. Cross-country maneuvers with military vehicles decrease habitat quality by killing sagebrush and disturbing understory plant communities (Cadwell et al., 2001 *in* WDFW 2013). Training activities also start wildfires that have degraded significant portions of the habitat, although the adjacent highway is also the source of some fires (WDFW 2013).

### Sage Grouse Management Units

Fourteen management units were delineated within the historical range of sage-grouse for the recovery plan (Stinson et al. 2004). These units still contain significant concentrations of shrub-steppe and have potential for contributing to recovery of the sage-grouse and were delineated not to limit management but to focus recovery efforts in areas most likely to contribute to recovery goals (Stinson et al. 2004). The management units were delineated based on current occupancy, land ownership, location, topography, habitat quantity, and potential for use by sage-grouse (Figure 4). Currently, the northern sage-grouse population (Moses Coulee population in Douglas and Grant Counties) is located primarily in the Mansfield Plateau and Moses Coulee Management Units, while the southern population is primarily in the Yakima Training Center Management Unit (Yakima and Kittitas Counties). Individuals are occasionally spotted in other areas. The reintroduced Lincoln County population occurs within the Crab Creek Management Unit in Douglas County.



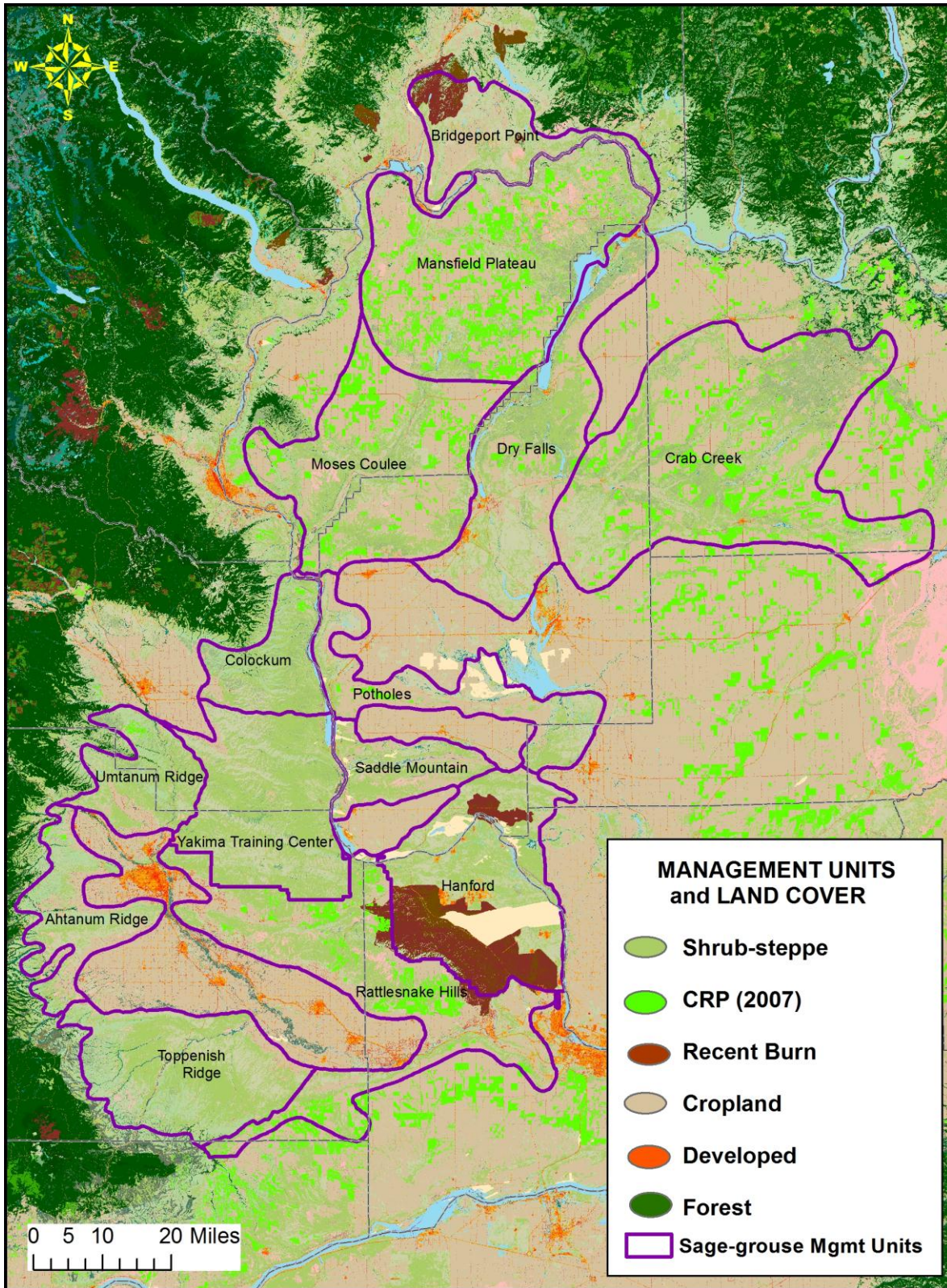


Figure 4. Sage-grouse management units in Washington in relation to land cover types (Compiled from National Land Cover, Northwest GAP Analysis Project and 2007 CRP data).

## CONSERVATION STRATEGIES AND TASKS

The Washington Department of Fish and Wildlife (WDFW) Greater Sage-grouse Recovery Plan (Stinson et al. 2004) outlines conservation strategies and tasks to increase sage-grouse population size and distribution in Washington to ensure the existence of a viable population of the species in the state. The long-term persistence of sage-grouse in Washington will depend on protecting, enhancing, and increasing the amount of suitable shrub-steppe habitat, re-establishing additional populations, and expanding existing populations outside the currently occupied areas. Sage-grouse recovery in Washington will take a sustained cooperative effort by many agencies and individuals for an extended period of time. A summary of the conservation strategies and tasks identified in the Washington State Recovery Plan (Stinson et al. 2004) that have been addressed to date are discussed below.

### **1 Inventory and monitor the greater sage-grouse population in Washington.**

#### **1.1 Conduct lek counts and survey for lek complexes.**

##### **1.1.1 Conduct annual lek counts with established protocols.**

WDFW staff count birds annually at 26 active leks and another nine inactive leks are checked for activity (M. Schroeder pers. comm.; Connelly et al. 2003). WDFW established protocol requires at least four visits per lek under acceptable weather conditions.

YTC has conducted annual lek counts since 1989. YTC established protocol (Livingston 1998) requires a minimum of four annual lek counts but lek count effort typically exceeds the minimum (C. Leingang pers. comm.). YTC staff currently count birds and monitor activity at 19 leks on the YTC.

##### **1.1.2 Conduct surveys for new leks.**

Searches for new leks are done opportunistically each year. To focus efforts on the most likely locations for leks to occur, a Geographic Information System (GIS)-based model was developed using a profile of lek locations derived from data on landscape variables and inter-lek characteristics of currently active Douglas County sites. This effort has resulted in the location of four sage-grouse leks in 2010 and three in 2012; most were completely new lek sites, but some were relocations of known leks that moved considerable distance or were satellite leks adjacent to established sites. One site discovered on CRP land in 2010 has been the largest known lek in the state for the past four years. This lek likely had been there for at least a few years and gone undetected, but it was in a large matrix (about 50 km<sup>2</sup>) of CRP-dominated habitat that was unsuitable for sage-grouse until relatively recently.

The YTC annually conducts ground surveys for new lek sites in all suitable habitat (Livingston 1998). More encompassing aerial searches are typically conducted every three to six years, depending on funding availability. Surveys for leks are also conducted when the National Environmental Policy Act (NEPA) process identifies a project as potentially impacting sage-grouse or sage-grouse habitat (C. Leingang pers. comm.).

#### **1.2 Coordinate data collection and maintenance.**

WDFW data is recorded in the Wildlife Survey Data Management (WSDM) database annually. WSDM contains information on documented observations for state and federally listed species including those designated as state endangered, threatened, sensitive, candidate, and monitor species. Data for other

species considered a priority by WDFW are also included. These data are used for the development of survey needs and priorities, conservation efforts, research projects, management and recovery plans and species status reports (WDFW 2010).

YTC maintains their own database and provides the information to WDFW and other stakeholders annually.

### **1.3 Estimate population size.**

The sage-grouse population size for the state is estimated using lek survey counts (Connelly et al. 2003; Stinson et al. 2004) from the three sage-grouse population areas. Population estimates from 2011 to 2013 were down from a high count of 1,284 birds in 2010 (Figure 2). The total populations were estimated to be approximately 1,084 birds in 2012 and 998 in 2013. In 2012 there were estimated to be 146 birds on the YTC, 853 in Douglas County, and 45 in Lincoln County. The 2013 spring population estimates showed decreases in the Douglas County population (712) whereas the YTC and Lincoln County both showed increases at 221 and 65 birds respectively (Figure 3). Annual changes in populations may not be meaningful but the conversion of CRP back to cropland and wildfires may have contributed to the population declines in Douglas County seen since 2010 and translocations of sage-grouse to Lincoln County may be reflected in the population increase seen there.

### **1.4 Evaluate population trend.**

Grouse populations, including those of sage-grouse, exhibit significant fluctuations year-to-year but population declines in Washington are well documented (Hayes et al. 1998). Schroeder et al. (2000) estimate that the population decline of sage-grouse from 1960 to 1999 in Washington may be as high as 95%. Since 1992, the Washington sage-grouse population has remained between 700 and 1,300 (Figure 2). However, based on changes in number of males counted on lek complexes, the sage-grouse population size in Washington declined more than 50% from 1970 to 2013 (Schroeder et al. 2013c).

Lek survey data collected in 2013 indicated a count of 274 males in Douglas County representing a 17% decrease from 2012 (331). Monitoring data on the YTC from 1989 to 2012 also show a downward trend with the lowest population estimate (146) occurring in 2012. This represented a 39% decrease from 2011 count data but the populations rebounded to approximately the 2011 levels (221 birds) in 2013 (YTC 2013).

Reports from other states suggest a range-wide decline (since at least 2010), likely related to drought conditions (USFWS 2013a). Washington experiences drought conditions every few years with the droughts of 1977 and 2001 listed as the worst and second worst in history (Emergency Management Division 2014). 2005 and 2010 are the most recent drought years listed by the Washington Department of Ecology (2014) and 2014 has been declared a moderate drought year although the water year was not over at the time of publication of this report.

## **2 Protect sage-grouse populations.**

### **2.1 Protect active sage-grouse leks from human disturbance.**



### **2.1.1 Avoid activities that interfere with sage-grouse at or near leks.**

Interference with sage-grouse at or near leks is minimal because motorized access on public lands (Bureau of Land Management [BLM], WDFW, and YTC) is limited (few open roads with minimal access to areas near leks). Access on tribal land (Yakama Nation) is also limited. Although access on private land is controlled by private landowners, there is generally minimal disturbance during the nesting and brood-rearing seasons (M. Schroeder pers. comm.). There are no specific limits to off-road vehicles, snowmobiles, camping, photography, and/or bird watching on private land, but disturbance has not been identified as a problem.

### **2.1.2 Avoid potentially disturbing activities such as farming, mining, and recreation near leks (within 2 kilometers) between the hours of 1800 and 0900 during February-April.**

The YTC has temporal and spatial protection measures for sage-grouse. Protection measures are contained in the YTC Sage-grouse Management Plan (Livingston 1998) and in annual memoranda that delineate sage-grouse protection measures (Memorandum IMLM-YTC-PWE 2013). Protections include year-round restriction to bivouacking and digging in the Sage-grouse Protection Area (SGPA), seasonal restrictions on activities and access within the SGPA, and flight restrictions within one kilometer of active leks. Activities are also only allowed on established training ranges and designated roads. Daily restrictions of activities on established training ranges between the hours of 2400 and 0900 are implemented from 1 Feb to 15 May. Military training and other activities such as hunting, livestock trail-through and most land management activities such as road or range facility repair are either not allowed or restricted in the SGPA from 1 February to 15 June (Livingston 1998).

There are no specific rules about usage in other portions of the sage-grouse range. Rules have not been necessary because the locations of leks are largely unknown to the general public.

Agricultural activities have the potential to disturb birds at leks but the type of agriculture most common in Douglas County makes disturbance less likely. Birds return to leks, some of which are in agricultural fields, in Douglas County late February or March (Schroeder 1994) and the peak of lek attendance is from mid-March to mid-April (Pederson, 1982 *in* Stinson et al. 2004). Dryland winter wheat or canola are the most common crops in north-central Washington and those crops are tilled and planted in the summer and fall so agricultural activities are not common in the spring when the birds are at the leks or nesting (J. Cotton pers. comm.).

Application of glyphosate may occur once in early March for weed control on agricultural fields but would take less than one day and spraying would occur during daylight hours after the weeds have dried off for better adhesion of the herbicide (J. Cotton pers. comm.). Sage-grouse spend early morning and late evenings at leks and are in nearby shrub-steppe during other times (Batterson and Morse 1948, Wallestad and Schladweiler 1974). Average date of nest initiation is 22 April and average lek-to-nest distance is 3.6 miles (5.1 kilometers) in north-central Washington (Schroeder 2001).

Regulations on the specific timing of farming activities could have negative public relations consequences that could prove to be disproportionate to the potential benefits (M. Schroeder pers. comm.).

In addition, sage-grouse are a covered species in the Douglas County Multiple Species General Conservation Plan (MSGCP) that is currently being reviewed by USFWS. Participating farmers are covered for a specified amount of “take” and to participate they are required to develop a resource



management system that addresses all resource concerns for soil, water, air, plants, and animals and minimizes or avoids the effects of their activities to covered species.

### **2.1.3 Provide advice to regulatory agencies and private landowners to minimize disturbance from construction and development activities, particularly within 1 kilometer of breeding habitat during February to June.**

WDFW, WDNR, Natural Resources Conservation Service (NRCS), Farm Services Agency (FSA) and the Foster Creek Conservation District (FCCD) have been involved in conservation programs with farmers and ranchers. Interactions with private landowners have focused on the provision of incentives to encourage the use of best management practices (BMPs) in land management operations and/or the application of conservation practices. Many of the BMPs are contained in the NRCS Field Office Technical Guide and deal with actions on CRP and range management issues.

The Growth Management Act (GMA) is Washington's primary regulatory tool to protect rare and threatened species from development impacts and uses best available science. Local governments are required to follow the GMA which states that they must create and implement development regulations that protect sage-grouse and sage-grouse habitat. The state rule implementing GMA (WAC 365-190-130) requires that fish and wildlife habitat conservation areas (FWHCA - a particular type of critical area) must be considered and designated and "Counties and cities should consult current information on priority habitats and species identified by the Washington State Department of Fish and Wildlife."

The Priority Habitat and Species (PHS) Program referenced in state rule provides important fish, wildlife, and habitat information to local governments, state and federal agencies, private landowners, consultants, and tribal biologists for land use planning purposes, permit application, and the evaluation process. PHS management recommendations are available to local planning entities at [http://wdfw.wa.gov/conservation/phs/mgmt\\_recommendations/](http://wdfw.wa.gov/conservation/phs/mgmt_recommendations/). Both the sage-grouse and shrub-steppe habitat are included on the PHS list, as well as the information necessary to incorporate avoidance and minimization measures in land use planning. For example, permanent developments such as buildings, parking lots, gravel pits, and gravel roads, and any activity that creates continuous noise during the display season, should be no closer than 3 kilometers from leks (Azerrad et al. 2011).

Once sage-grouse and shrub-steppe habitat are designated by a county as a FWHCA, the county's critical areas ordinance (CAO) and development regulations require additional protection measures and/or a management plan to protect species or the habitat that is designated in the FWHCA. In addition, the county adopts land use zoning ordinances and regulations that ensure developments outside of urban growth areas (UGAs, or areas designated for dense, city-like development) remain rural in character, and do not occur on natural resource lands designated for long-term agricultural use, (which may retain some shrub-steppe functions). These regulations provide an additional conservation benefit by focusing human populations within urban areas and protecting agricultural lands and maintaining other open spaces. Together, all these regulations and ordinances implement the county's comprehensive plan, and can provide a landscape-scale avoidance and minimization approach.

These regulations and ordinances also provide protection for sage-grouse and shrub-steppe at the site scale. Development proposals and infrastructure projects must first pass review for compliance with the comprehensive plan and zoning ordinances adopted by the local government. Once the project has been

through this review process, they must also obtain the appropriate development permits. The development permit process also triggers a review specific to the jurisdiction's CAO, which by state law must include the best available science when adopted. As mentioned above, FWHCAs are a particular kind of critical area, and WDFW recommends both sage-grouse and shrub-steppe habitat to be included in FWHCAs where they occur. In addition, PHS GIS data (including proximity to known occurrences) is often used to trigger additional requirements, including a property survey by a qualified professional biologist. If sage-grouse or shrub-steppe are found to occur on that site, the suite of CAO protections are required.

Local government planners often communicate directly with WDFW staff when reviewing a proposal that may affect state listed or priority species. WDFW staff review the proposed Habitat Management Plans and provide feedback to both the consultant and local government on the adequacy of the plan to protect the species and may verify the presence or absence of the species on the parcel.

The local government's responsibility to manage development in this way is accompanied by civil authority for regulating compliance with the ordinance and the approvals. Most local governments have dedicated code enforcement officers who inspect site developments relative to permit requirements and process citations and stop work orders through the local prosecutor or hearing examiner as necessary. Thus, while it is true that PHS Management Recommendations are not regulatory in and of themselves, their adoption through the development regulations of counties and cities causes them to be, in effect, regulatory.

Yakima, Kittitas, Douglas, Benton, Grant, Lincoln, and Franklin Counties identify threatened, endangered, and sensitive species and their habitat associations as FWHCAs, and provide additional protections for these areas in their ordinances. Yakima, Grant, and Benton Counties specifically identify those species and habitats identified by WDFW, which include sage-grouse and shrub-steppe, as noted above. Lincoln and Franklin Counties identify all federal and state endangered, threatened, and sensitive species for protection as FWHCAs. Douglas County also protects endangered, threatened, and sensitive species and, while their ordinance does not specify federal or state, WDFW's PHS maps are used to help designate where these areas occur. Kittitas County provides protections for "threatened, endangered, or sensitive priority species" (Kittitas County Code, Titles 17A.02 Definitions and 17A.07 Habitat). In each of these cases, known or discovered locations of these species and habitats triggers additional protections. Though the specific nature of these protections varies across the counties, the inclusion of sage-grouse and shrub-steppe habitat (whether specifically as a result of the PHS listed species, or generally as a result of state listing and association with particular habitats) provides a mechanism for minimizing disturbance from construction and development activities.

WDFW staff looks for opportunities to pair the regulatory protections described above with acquisition and incentive approaches, so as to provide an effective network of protection across land ownership.

YTC also incorporates best management practices and mitigation measures during the NEPA process for construction related projects both on and adjacent to the Training Center (C. Leingang pers. comm.).

### **2.1.5 Treat lek locations as sensitive data.**

Land managers and agency personnel do not disclose lek locations to the public or encourage viewing at leks in order to minimize disturbance except under conditions defined in its Releasing Sensitive Fish and

Wildlife Policy #5210. There is a pilot ‘adopt-a-lek’ program which results in the training of citizen scientists to conduct lek surveys at some sites, but participants must sign a non-disclosure agreement prior to enrolling. This program was implemented to allow additional time for WDFW biologists to search for new leks (1.1.2). Counties, agents, consultants and others who request lek location information from WDFW must also sign a non-disclosure agreement before the information is released. BLM does not maintain databases with lek locations and has signed a Sensitive Fish and Wildlife Data Release Notification Agreement for Federal Agencies for use of WDFW lek data.

The YTC also treats sage-grouse lek locations as sensitive and will only allow access to the public through lek tours escorted by YTC personnel at selected observation points to minimize disturbance to the birds. These tours are limited to two per year and attendance is limited to 15 individuals per year.

## **2.2 Protect nesting and brood rearing areas from disturbance.**

Vehicular access to nesting sites on public and tribal lands (BLM, WDFW, YTC and YN) is limited. While access on private land is controlled by private landowners, there is generally minimal disturbance during the nesting and brood-rearing seasons (M. Schroeder pers. comm.). Off-road vehicle travel on WDFW lands is prohibited by law. There are no specific limits on use of off-road vehicles or snowmobiles, camping, photography, and/or bird watching on private land, but disturbance to nesting and brood rearing from these activities is not known to be an issue (M. Schroeder pers. comm.).

Conversion and/or development of lands enrolled in Farm Bill programs have specific guidelines for methods used to treat fields; these methods are primarily focused on timing designed to minimize potential impacts on nests and young broods by avoiding treatment (primarily burning or mowing) from mid-March through mid-July. These conditions are also incorporated into the Douglas County MSGCP. Treatment to fields cannot be done under NRCS programs during that time window, with the exception of areas that have minimal value to sage-grouse that are being established as habitat for the first time when first enrolled in CRP.

Department of Natural Resources (DNR) biologists use the Total Resource Application Cross-Reference (sensitive wildlife and plant locations, commonly known as TRAX) database to identify and protect known locations of sage-grouse on their land. They also identify critical shrub-steppe habitat through the Natural Heritage Program plant database.

On the YTC, the protections outlined in 2.1.2 include leks, nests, and brood rearing areas within the Sage-grouse Protection Area (SGPA). YTC also expanded its SGPA from approximately 44,000 acres (14% of installation) to 77,600 acres (24% of installation) in 2010 (C. Leingang pers. comm.).

## **2.3 Minimize incidental mortality.**

### **2.3.1 Enforce regulations that protect sage-grouse from harm and harassment.**

Based on telemetry research, harm and harassment have not been issues with sage-grouse in Washington. Of the more than 250 sage-grouse radio-marked by WDFW and YTC since 1992 there were no instances of poaching. Most sage-grouse are in areas where they were rarely disturbed by people. Many nested successfully adjacent to, or close to, agricultural fields (M. Schroeder pers. comm.). Only one of 182 nests was in a wheat field and it was destroyed during plowing (Schroeder 1997).

YTC enforces the protection measures contained in the YTC sage-grouse management plan. It requires falconers to fly from the fist and to positively identify potential prey prior to release of their bird if in the SGPA. All public recreational access in SGPA is prohibited from 1 Feb to 15 June.

### **2.3.2 Document incidents of illegal and accidental killing of sage-grouse and evaluate the need for remedies.**

Sage-grouse have not been legally harvested in Washington since 1987. Because harvest of other game birds is allowed on some of the same areas where sage-grouse are found, WDFW has taken steps to avoid



accidental take through hunter education. For example, diagrams and maps that show sage-grouse descriptions and concentration areas are placed in the hunting guidelines. In addition, a sign was developed and placed at numerous locations throughout the Swanson Lakes Wildlife Area (SLWA) to illustrate the appearance of sage-grouse and help hunters avoid accidental harvest (Figure 5).

Telemetry research on sage-grouse has shown that incidents of illegal and accidental harvest have not been a major issue in Washington with no documented poaching or accidental harvest of radio-marked birds. Of unmarked birds there are only four reported incidences of illegal killing of sage-grouse since sage-grouse hunting season was closed in 1988: Two wings were deposited in a wing barrel in 1994, one female was poached on the YTC reported by Livingston and Nyland (2002), and one was shot by a hunter on SLWA in 2008 (M. Schroeder unpublished data).

Figure 5. Sign posted at Swanson Lakes Wildlife Area.

### **2.3.3 Carefully review scientific collection permits issued by WDFW that involve disturbance or handling of sage-grouse.**

In the last 15 years, 36 sage-grouse have been captured in Washington (all on the YTC) and these captures were conducted by experienced biologists with no capture related mortalities.

## **2.4 Reduce the collision and predation hazards posed by poles, wires, and fences.**

### **2.4.1 New powerlines and utilities should use existing corridors or be located so as to minimize collision risk and damage to habitat.**

In Washington, WDFW and BLM closely scrutinize new powerline (higher Kv transmission lines and lower Kv distribution lines) locations to minimize collision risk and damage to habitat, especially lines that would cross the YTC. This placement information is based on ongoing research with sage-grouse that includes data from radio-marked birds, lek persistence, and genetics. Collisions with powerlines

accounted for 33% of juvenile mortality at one site in Idaho, (Beck et al. 2006) and in Nevada nest and female survival were affected by the distance to transmission lines (Gibson et al 2013).

Recent studies have shown that powerlines across travel corridors may have a large negative impact on long-term connectivity between populations (Robb and Schroeder 2013). Two of three radio-collared female sage-grouse released in Lincoln County that dispersed to Douglas County were found dead in close proximity to a transmission line located on the eastern edge of Douglas County (Robb and Schroeder 2013). One of the long-term costs of lower connectivity is the need for additional or continued translocations. The best ways to minimize impacts to sage-grouse may include using existing transmission corridors, burying lines, and/or avoiding connection pathways between sage-grouse populations. A white paper by WDFW ranks various powerline placement options with respect to relative impact on connectivity between Washington sage-grouse populations (Schroeder et al. 2013a).

The siting of new electric transmission facilities varies from state to state. A white paper by Holtkamp and Davidson (2009) summarizes the BMPs of the western states. The information on Washington (pp: 40-42) states:

*The State of Washington Energy Facility Site Evaluation Council (EFSEC) was created by the Energy Facilities Site Location Act (EFSLA). The EFSEC consists of representatives from various state agencies and, on a project-by-project basis, representatives of affected local governments. The EFSEC coordinates all of the evaluations and permits for siting certain energy facilities in Washington. The EFSLA supersedes all siting decisions by other state or local government entities.*

*The EFSLA applies to all facilities in a designated National Interest Electric Transmission Corridor (NIETC) and to other transmission facilities in excess of 115 kVA capacity regardless of whether they are in a NIETC. The developer of a new wind power generation facility has the option of pursuing a permit through either EFSEC or the local jurisdiction (cities and counties).*

*The EFSEC process for obtaining site approval for electric transmission facilities or other energy facilities in Washington comprises several steps, leading to a Site Certification Agreement (SCA) executed by the governor.*

*The EFSEC's policy is to conduct cooperative NEPA/State Environmental Policy Act (SEPA) reviews when possible. For major energy facilities, the EFSEC becomes the lead SEPA agency.*

*The EFSEC is required to consult with other state agencies, utilities, local governments, public interest groups, tribes, and other interested parties. EFSEC review must determine whether the proposed site is in compliance and consistent with city, county, or regional land use plans or zoning ordinances.*

*Washington counties and municipalities are empowered to regulate the siting of electric transmission lines and other energy projects through their respective comprehensive planning and development regulation processes. In particular, local governments, through the Washington Growth Management Act, are required to develop a*



*comprehensive plan to encourage the most appropriate uses of land throughout the municipality or county and to facilitate those uses.*

Smaller distribution lines that are not required to go through the EFSEC process and wind energy projects that choose to be permitted locally are still required to comply with State Environmental Policy Act (SEPA) and NEPA review where appropriate.

**2.4.2 Existing powerlines should be buried or modified with perch guards to prevent use as raptor perch sites.**

Recent research at the SLWA has shown that sage-grouse avoid power distribution lines in areas with habitat that is otherwise suitable (Stonehouse 2013). Power distribution lines and poles that were not

Table 1. Power distribution lines and poles removed in Lincoln County.

Year	Powerlines and Poles	
	Poles removed	Lines removed
2011	34	2.6 miles
2012	26	1.7miles
<b>Total</b>	<b>60 poles</b>	<b>4.3 miles</b>

needed were removed from BLM and WDFW land in and near the SLWA (Table 1). Burial of powerlines is expensive so only lines that clearly pose a hazard to sage-grouse are likely be buried. Other research at SLWA has shown that raptor foraging does occur from power poles and although different types of deterrents reduced perching better than others, all horizontal surfaces had to be fitted with spikes for deterrents to be effective and no deterrent

completely stopped perching, especially by smaller raptors (Dwyer and Doloughan 2014 in press).

Table 2. Miles of fence removed, marked or burned by county 2010 to 2013 (WDFW 2013b; SGI 2013; D. Peterson pers. comm.; J. Gallie pers. comm., C. Leingang pers. comm., J. Lowe pers. comm.).

County	Year	Fence Removed (miles)	Fence marked (miles)	Marked, SGI funded (miles)	Burned (miles)
Lincoln					
	≤2010	15			
	2011	5	126		
Douglas					
	≤2010	37	35	26	
	2011		5	2	
	2012			35	
	2013	6	1	16	14*
Kittitas/Yakima (YTC)					
	≤2010	73			
	2011	17			
	2012	4	6		
	2013		5		
<b>Total</b>		<b>157</b>	<b>178</b>	<b>79</b>	<b>14</b>

\*This fence has not been removed yet but is slated to be removed in 2014.

**2.4.3 Remove unneeded fences in sage-grouse use areas.**

Recent research has found that attaching markers to fence wires increases visibility of the wires to sage-grouse and can drastically reduce collisions with fences by sage-grouse and other shrub-steppe birds (Stevens et al. 2012). Many miles of fences have been marked on public and private land in Lincoln and Douglas Counties by WDFW, BLM, Conservation Districts, and volunteers, especially sportsmen. In addition to marking fences, many old fences in interior portions of

wildlife areas have been removed (Table 2). In 2014, WDFW is working with the NRCS Sage Grouse Initiative (SGI) coordinator to identify, mark, or remove the remaining fences within 1.2 km of an occupied lek site and BLM will be marking additional fences in Yakima County. All new BLM fences installed in sage-grouse habitat will be marked as they are installed (J. Lowe pers. comm.).

The YTC continues to mark fences that are determined to be necessary and to remove fences and elevated structures that are not necessary. For example, firing range observation towers have been removed in key sage-grouse areas to reduce the number of perches and nesting platforms for raptors and common ravens (*Corvus corax*) (WDFW 2012).

## **2.5 Minimize or eliminate exposure of sage-grouse to organophosphate insecticides.**

Exposure to organophosphate insecticides has been shown to be harmful to sage-grouse (Blus et al. 1989). Washington's grouse however are not exposed to insecticides because they tend to use wheat fields where insecticides are not commonly used. However, WDFW should be aware that changes to insecticide use near sage-grouse habitat could impact sage-grouse.

YTC does not typically apply insecticides in or around the SGPA (C. Leingang pers. comm.) and BLM does not apply insecticides on their land (J. Lowe, pers. comm.).

## **3 Enhance existing populations and re-establish additional populations.**

### **3.1 Evaluate the feasibility of sage-grouse re-introductions.**

#### **3.1.1 Identify additional sage-grouse management units that may require reintroductions and determine habitat restoration that will be needed to support populations**

Previous assessments of habitat in Washington showed that two management units containing habitat with the highest likelihood of supporting successful reintroductions were Toppenish Ridge (Yakama Nation) in Yakima County and Crab Creek (SWLA and BLM lands) in Lincoln County (See Figure 4). Habitat assessments were conducted to evaluate habitat condition, the potential area of occupancy, and the connectivity with existing populations (Jamison and Livingston 2004). Following these assessments, reintroduction efforts were initiated in 2006 (Toppenish Ridge) and 2008 (Crab Creek). Although it is possible to identify additional areas in Washington, these two areas clearly have the greatest potential for range expansion. Eventually the goal is to have sage-grouse in all sage-grouse management units in Washington (Figure 4). The Bridgeport Point, Dry Falls, Colockum, Saddle Mountain, Potholes, Hanford, Rattlesnake Hills, Ahtanum Ridge, and Umtanum Ridge units are largely unoccupied, even though sage-grouse are occasionally observed. The barriers and connections between occupied and unoccupied units are described in the recent Columbia Plateau connectivity report (WHCWG 2013).

### **3.2 Conduct reintroductions and population augmentations.**

#### **3.2.1 Develop scientifically approved protocol for sage-grouse translocations in Washington.**

Based on results from translocations in other states, international guidelines (IUCN 2009, Toepfer et al. 1990, Connelly and Reese 1997) and experiences of agency biologists, WDFW has developed a protocol for translocating sage-grouse to Washington (Schroeder et al. 2013c). This protocol has been used every

year since 2008 and has been communicated with states containing source populations. The protocol includes issues of timing, captivity, source populations, release techniques, monitoring requirements, and report writing and delivery.

### 3.2.2 Conduct augmentations to existing populations to maintain genetic diversity.

Due to low genetic diversity, population isolation, and population declines, translocation of sage-grouse from a source population outside of Washington appears to be necessary to improve the viability of the existing population on the YTC (Small et al. 2011). Translocations were performed in 2004, 2005, and 2006 in order to augment the population (Table 3). Populations on the YTC have not increased since

Table 3. Greater sage-grouse released on the Yakima Training Center Sage-grouse Management Unit (YTC).

(State)	2004 (NV)	2005 (OR)	2006 (OR)	Total
Male	0	5	1	6
Female	25	16	14	55
<b>Total</b>	<b>25</b>	<b>21</b>	<b>15</b>	<b>61</b>

2004 so current plans are for additional augmentation in 2014 or 2015. It is hoped that improvement of this population will increase the potential for range expansion into adjacent management units.

### 3.2.3 Conduct reintroductions to re-establish populations in areas where sage-grouse have been extirpated and where assessments indicate that habitat is of sufficient quantity and quality to support populations.

WDFW, in cooperation with the BLM, Washington State University (WSU), Oregon Department Fish and Wildlife, and the USFWS, initiated a project in 2008 to reintroduce greater sage-grouse to SLWA and adjacent BLM lands in Lincoln County. Sage-grouse were extirpated from the county in 1987, but habitat has improved since that time, with more than 200 km<sup>2</sup> of shrub-steppe habitat now in public ownership. From spring 2008 to spring 2013, 201 sage-grouse were translocated from southern Oregon to the release area (Table 4).

Table 4. Number of greater sage-grouse released on the Crab Creek Sage-grouse Management Unit, (SLWA, Lincoln County).

	Spring 2008	Fall 2008	Spring 2009	Spring 2010	Spring 2011	Spring 2012	Spring 2013	Total
Male	10	7	15	23	20	20	10	102
Female	7	17	13	15	17	18	10	99
<b>Total</b>	<b>17</b>	<b>24</b>	<b>28</b>	<b>38</b>	<b>37</b>	<b>38</b>	<b>20</b>	<b>201</b>

The Yakama Nation and the University of Idaho are working together to re-establish a population on the Yakama Reservation in the Toppenish Ridge Sage-grouse Management Unit. A total of 98 sage-grouse have been released since 2004. Eight birds were observed in 2012, likely a result of the earlier releases (60 grouse released in 2006 and 2007), but no active leks are known. In 2013, 12 females and 26 males from Nevada were released with more translocations planned for 2014-2015 (Unpublished data).

### **3.3 Monitor and evaluate translocations.**

The movements, productivity, habitat use, and survival of the translocated birds at SLWA have been monitored. Display behavior was first observed in 2010 (three males strutting for two nearby hens), and in 2011 a lek site was established by males from the previous years' releases with a high count of 10 males. The same lek was active again in 2012 and 2013 with male counts of 14 and 18 birds respectively. Forty-four nesting attempts have been documented since 2009, with 22 hatches, 37 fledged chicks and 13 successful broods where at least one chick of that brood survived at 50 days of age. Additionally, hens without collars have been observed with broods (2011 and 2013), indicating that recruitment is occurring (Schroeder et al. 2013c; M. Atamian pers. comm.). Mortality of translocated birds was well within the range for the species but birds that moved long distances from the study site had higher mortality rates (Schroeder et al. 2013c).

YTC monitored and evaluated the initial 2004-2006 translocation effort on the installation through radio telemetry, lek counts, searches for new leks, and genetic analysis (Livingston et al. 2006, Small et al 2011). In 2012 to 2013 a telemetry study was undertaken that validated core-use areas, validated expansion of the SGPA, and documented off-post movement. The study also looked at sage-grouse spatial distribution in relation to fire impacts, prioritized fence removal and marking projects, and identified priority habitat restoration sites. In 2012, YTC began monitoring 15 males and 9 females, and are currently monitoring 8 males and 6 females with plans to continue monitoring in 2014 (C. Leingang pers. comm.).

The Yakama Nation monitored translocated birds on the Toppenish Ridge Unit via radio telemetry from 2006 to 2008 for as long as radio collars functioned. The 2013 translocations were monitored as part of a graduate thesis project looking at nesting, dispersal, and survival (D. Blodgett pers. comm.).

## **4 Protect sage-grouse habitat on public lands.**

### **4.1 Within Sage-Grouse Management Units, map shrub-steppe habitat into specific categories based on features that are significant to sage-grouse, including potential habitat type (breeding, brood-rearing, winter), management history, habitat quality, and suitability for sage-grouse, and prioritize for protection.**

Sage-grouse landscape-level maps and GIS layers have been developed as part of the Washington Connected Landscapes Project. These include maps of: resistance to movement; habitat concentration areas (HCAs) based on recovery units, and also based on extant lek and nest locations; and linkages between habitat areas (WHCWG 2010, 2012). There is also ongoing research to develop an occupancy model for sage-grouse in Washington (M. Schroeder pers. comm.).

YTC has mapped vegetation communities and continues to refine its sage-grouse habitat map. Annual updates are made to account for land-use impacts and wildland fires. Habitat maps are used in all land-use planning efforts on the YTC.

BLM conducted detailed habitat mapping in the Crab Creek Management Area in Lincoln County where reintroductions have occurred. The map focused on separating scabland from deep soil shrub-steppe and displays three classes of shrub cover. Because of recent fires, this mapping effort illustrates the influence fire has had on seral stage composition in the re-introduction area (J. Lowe, pers. comm.).

#### 4.1.1 Prioritize habitat areas within the recovery area for protection.

Habitat within Washington has been prioritized with areas containing the remnant endemic populations (YTC, Moses Coulee, Mansfield Plateau) designated the most important for protection and Crab Creek and Toppenish Ridge (reintroduction sites) the next highest in priority. Because the northern portion of the Rattlesnake Hills unit is now occupied, this area has increased in priority. All of these areas were subsequently added to a national map identifying “priority areas for conservation” (PACs –USFWS 2013a; Figure 6). The other areas may rank lower in priority, but they are still important to potentially support resident birds or maintain metapopulation connectivity (Robb and Schroeder 2012). The lowest priority areas are those that are not within a management unit, but are still within the historical distribution of sage-grouse in Washington. The Arid Lands Initiative (ALI) is also in the final stages of prioritizing land in the range of the sage-grouse for conservation action, with sage-grouse as one of a suite of target species.

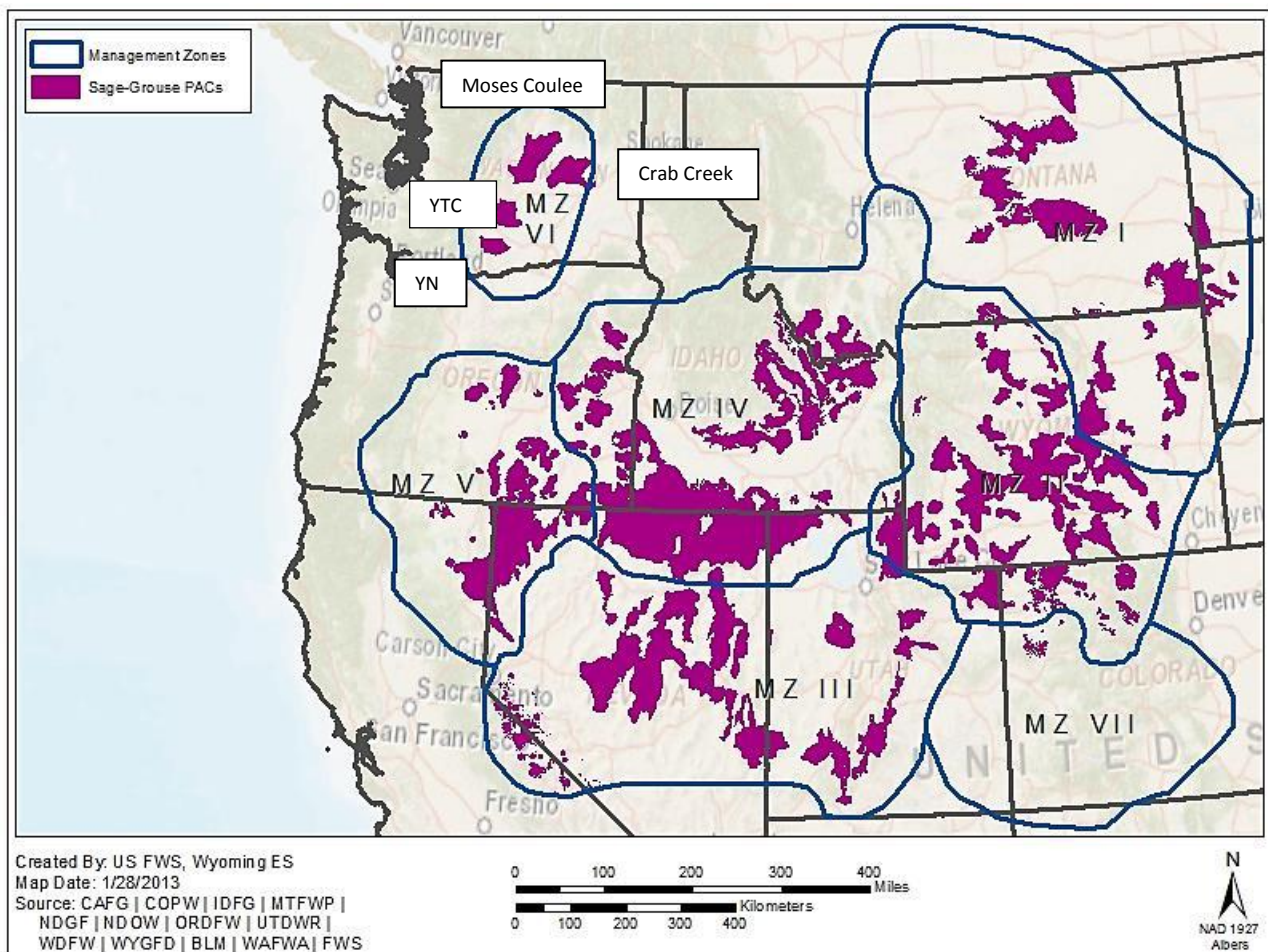


Figure 6. National sage-grouse priority areas for conservation (PACs). The Columbia Basin Greater Sage-grouse Management Zone (VI) contains four PACs: Moses Coulee, YTC, YN and Crab Creek (Stiver et al. 2006).



#### 4.1.2 Evaluate habitat capability of the Hanford Unit with existing vegetation maps, and assess need and feasibility of restoration.

The USFWS has evaluated the habitat in the Hanford Unit and followed the evaluation with intensive restoration. However, because of frequent and extensive wildfires, it has been difficult to produce habitat of sufficient quantity and quality to support sage-grouse. Restoration techniques and effectiveness of sagebrush restoration have been evaluated following multiple years of fires on the Hanford Reach (Section 8.4) (Dettweiler-Robinson et al. 2013).

#### 4.1.3 Evaluate habitat connectivity and the capacity for sage-grouse movement between Sage-grouse Management Units.

The Washington Wildlife Habitat Connectivity Working Group (WHCWG) is addressing connectivity patterns for numerous focal species, including greater sage-grouse. An analysis of statewide connectivity patterns was published in 2010 (WHCWG 2010) and an ecoregional analysis for the Columbia Plateau was completed in 2012 (Robb and Schroeder 2012). These analyses modeled HCAs and movement corridors for sage-grouse (Figure 6). Pinch-points are bottlenecks in movement corridors and are “locations where loss of a small area could disproportionately compromise connectivity due to a lack of alternative movement routes” (Robb and Schroeder 2012). Barriers to movement between HCAs for sage-grouse were modelled in the addendum to the ecoregional analysis (Robb and Schroeder 2013) and barriers to movement used in the model are identified as freeways, powerlines, and other energy infrastructure. None of the linkages provide ideal connectivity between the sage-grouse HCAs and connectivity could be enhanced through expansion of the existing HCAs, development of new HCAs, or improving the quality of the linkage habitat (Robb and Schroeder 2012).

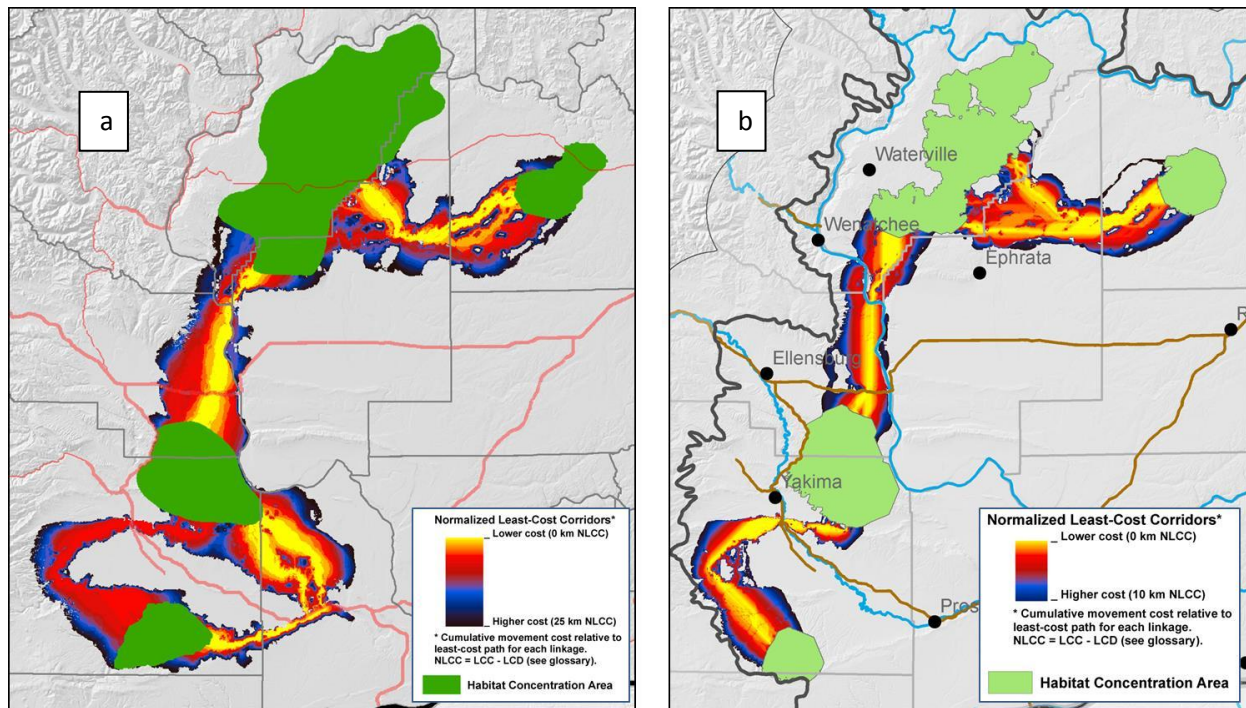


Figure 7. A close up of the linkages modeled for sage-grouse for the (a) statewide analysis and (b) Columbia Plateau Ecoregion analysis (Robb and Schroeder 2012).

#### **4.1.4 Rank sage-grouse habitat areas for ecoregional conservation assessments.**

The same evaluation of habitat capability completed on the Hanford (4.1.2) is needed on all of the management units, even those that are occupied. Although a Habitat Suitability Index model exists for Washington, most published modeling efforts conducted across multiple states have failed within Washington. The reasons for this are varied but are likely due to the lack of consideration of federal conservation programs and the inability to assess habitat quality within the general shrub-steppe ecosystem. An improved effort in Washington is greatly needed.

Another effort in Washington is the work of the ALI, a group of governmental (WDFW, WDNR, BLM, and USFWS) and non-governmental organizations (e.g., The Nature Conservancy –TNC and Audubon Society) formed in 2010 to engage landowners with the goal of conserving shrub-steppe across multiple jurisdictions. Sage-grouse have been identified as one of the focal species for which conservation strategies will be developed and implemented.

## **4.2 Protect habitat from fire.**

### **4.2.1 Develop and implement fire management plans on public lands to prevent catastrophic destruction of sage-grouse habitat.**

#### **Washington Department of Fish and Wildlife**

All WDFW Wildlife Areas have fire prevention and suppression plans as part of their wildlife area management plans. Fire suppression plans evaluate risks, identify responsibilities, identify priority areas and strategies for fire suppression, evaluate and map water resources if needed, and evaluate the need for firebreaks, green-stripping, and management of fuels. The management plans for all WDFW wildlife areas are currently being rewritten and the fire prevention and suppression portions of these plans will be evaluated and updated as the plans are rewritten. Part of this effort includes mapping of roads for fire suppression access and potential to act as firebreaks. Some roads on wildlife areas are primitive and are only for administrative use so may not be on other maps. Some of the PACs have fairly high road densities such as in Douglas County where there are roads along many of the section lines. Not all roads will function as firebreaks because not all roads on wildlife areas are wide enough but some may, depending on the intensity of the fire.

Wildfire suppression plans serve as a resource to the wildlife area staff as well as fire fighters should they need to suppress wildfires or plan prescribed burns. Maps in the plans show ownership, fire department jurisdictions, structures, fire breaks, and water sources. Fire suppression plans on sage-grouse units where reintroductions are occurring or may occur, specifically address sage-grouse habitat protections. For example, Sagebrush Flat Wildlife Area (within Moses Coulee) has unvegetated firebreaks in shrub-steppe as part of its fire prevention and suppression plan. BLM also assisted SLWA staff to develop fire control activities to help prevent large, catastrophic wildfires on the SLWA and Twin Lakes public lands in Lincoln County (WDFW 2012).

#### **Department of Natural Resources**

Title 76 RCW (Forest and Forest Products) was updated in 2012 to allow DNR to conduct fire suppression on non-forest state lands. DNR's primary responsibility is to suppress wildfires on 13 million acres of state and private forests and non-forested state lands including the lands within the sage-

grouse management units. WDFW entered into contract agreements for DNR to provide the fire suppression on shrub-steppe lands. DNR prepositions firefighting resources to critical wildfire risk areas within Washington when conditions indicate probability for large wildfires. During initial attack phase of a wildfire, DNR's response priorities are firefighter safety and to reduce wildfire spread on state and private lands within DNR's responsibilities. DNR's extended attack firefighting efforts involve consultation with the WDFW Land Managers to prioritize fire protections efforts and habitat needs. In addition, WDFW has agreements with local fire protection districts to fight fire on WDFW land.

### **Bureau of Land Management**

The 1999 catastrophic wildfires in the Great Basin brought together numerous resource specialists and agencies including the BLM to develop fuels management policies that contribute to the conservation of sage-grouse habitat. In June 2011 BLM laid out their policy guidance that augments sage-grouse protection on BLM land through their planning processes, maps, fire management decisions, and best management practices (Instruction Memorandum [IM] 2011-138). The IM directs decisions on fire management to include consideration of sage-grouse habitat based on local conditions.

Sage-grouse habitat conservation is also to be considered in BLM fuels treatment prioritization during project design, treatment location, and documentation. Updated localized maps of sage-grouse habitat are shared with dispatch offices, fire crew bosses, and other field fire responders. "Toolboxes" that include local maps, contact information of resource advisors, and best management practices for sage-grouse habitat protection are available at each management level. Resource Management and Fire Management Plans are kept up-to-date and these include guidance on sage-grouse and sage-grouse habitat management. This guidance includes prioritization of sage-grouse habitat as a critical resource for fire suppression.

Other BLM changes include the use of Predictive Services forecasts to pre-position people and fire-suppression equipment to optimize efficient response in sage-grouse habitat on critical fire weather days. Once a fire is reported, maps are used to determine if the fire is in or near sage-grouse habitat, the appropriate resources are dispatched, and on-the-ground incident managers are informed of the threat to sage-grouse habitat. Operations are directed to protect and conserve sage-grouse habitat (Murphy et al. 2013).

### **U.S. Fish and Wildlife Service**

USFWS's Hanford Reach National Monument has a fire management plan that calls for the continued suppression of all wildfires on the Monument. It also incorporates mutual aid agreements with surrounding communities and state and federal agencies and emphasizes a system of emergency communications (USFWS 2001).

In addition, USFWS and WSU are conducting site treatments of *Pseudomonas fluorescens*, a naturally occurring soil bacterium, for use as a biopesticide to control cheatgrass (*Bromus tectorum*). Cheatgrass is an introduced weed that is widespread in the west and is extremely flammable. Initial test results at the Hanford Reach National Monument are promising with single applications dramatically reducing cheatgrass in three to five years while not hurting other plants or animals. USFWS is working with Environmental Protection Agency to certify this treatment for broad-scale landscape treatment of cheatgrass. Federal registration may take five or more years (USFWS 2013b).

## **Department of Defense**

YTC has a wildland fire management plan that is implemented and reviewed annually (JBLMYTC 2012). The objectives of the plan include to “Minimize wildland fire impacts to cultural and natural resources” and “Develop and implement management strategies that reduce the risk of wildland fires spreading beyond the limit of designated areas (e.g., designated containment areas).” YTC has dedicated wildland fire suppression assets to include permanent and seasonal wildland firefighters, mutual aid agreements with adjacent fire districts, brush trucks, water tender, a type one helicopter, four bulldozers, fast fill and aerial water developments deployed downrange, firebreaks, a system of established fire containment areas, and risk assessment process in place to address the wildland fire risk associated with military training (C. Leingang pers. comm.).

### **4.2.3 Work with local fire managers to protect shrub-steppe important to sage-grouse.**

Unlike other areas in the west, Washington has local fire districts that have firefighting training and responsibility for protection of privately held shrub-steppe ownerships. Many of the communities in eastern Washington have a Wildland Urban Interface (WUI) where homes are built near or among lands prone to wildfires. To help defend these areas against wildfires many of the communities in shrub-steppe have developed Community Wildfire Protection Plans (CWPP). The CWPPs are developed by local citizens and state and federal agencies and can address wildfire response, reduction of risk factors, community preparedness, and structure protection. Several communities within the counties that contain sage-grouse management units have developed CWPPs including communities in Lincoln, Douglas, Benton, Chelan, Kittitas, and Yakima Counties

YTC has provided funding for a Shrub-Steppe Collaborative Partnership coordinator who regularly engages with local fire managers to address wildland fire threats to shrub-steppe. Yakima County Fire Adapted Communities Coalition sponsored a local one-day workshop and is revising the Yakima County CWPP.

## **4.3 Protect important sage-grouse habitat on public lands from development and agricultural conversion.**

### **4.3.1 Work with public agencies to minimize conversion of native shrub-steppe habitat.**

Protection is afforded to sage-grouse in the management provisions of the Safe Harbor Agreement between WDFW and USFWS for pygmy rabbits that protects shrub-steppe habitat. Through this 20 year agreement, 15 private landowners, DNR, and TNC are protecting 120,532 acres of shrub-steppe habitat in Douglas and Grant Counties (USFWS 2006).

WDFW is also drafting a wildlife area Habitat Conservation Plan (HCP) that includes sage-grouse as a covered species. The HCP includes the state owned wildlife area lands and contains measures to minimize or avoid effects to covered species for certain WDFW controlled activities. WDFW is also pursuing a Candidate Conservation Agreement with Assurances (CCAA) with USFWS for conservation actions on lands within Douglas and Lincoln Counties.

The BLM’s National Sage-Grouse Habitat Conservation Strategy (2004) states the following principles for protecting and managing greater sage-grouse habitat:

- Protection of unfragmented habitats.

- Minimization of habitat loss and fragmentation.
- Management of habitats to maintain, enhance or restore conditions that meet greater sage-grouse life history needs.

The BLM has recently come out with an Instruction Memorandum (IM 2012-043) that provides guidance for activities that affect the greater sage-grouse. Although the IM does not include the Washington population, it states that the Washington population will be addressed through other policies and planning efforts to “seek to maintain, enhance or restore conditions for greater sage-grouse and its habitat.” WDFW is a Cooperating Agency in this planning effort and is actively engaged in providing review and expertise during all phases of plan development.

DNR is working to identify critical shrub-steppe habitat for sage-grouse through the use of the Natural Heritage Program database. Within the PACs DNR is working to protect shrub-steppe habitat and to protect habitat from development and conversion to agricultural uses. DNR also includes specific Resource Management Plan (RMP) standards in agriculture leases such as maintaining existing native vegetation to provide permanent wildlife habitat and cover. DNR has 51,658 acres in sage grouse PACs that are being managed consistent with sage grouse conservation. These include CRP and CRP SAFE enrollments, Natural Area Preserves, and grazing leases conditioned for shrub-steppe protection. Approximately 27,000 acres of DNR land within the sage-grouse management units is under lease to and managed by WDFW to benefit sage-grouse.

YTC participates in NEPA and SEPA evaluations of proposals for development on public lands adjacent to the YTC that are or may be important habitat for sage-grouse recovery. They provide sage-grouse related information used in NEPA and SEPA assessments.

#### **4.3.2 Provide information to regulatory agencies about the potential for sage-grouse habitat loss from wind turbines and utility towers.**

Behavioral avoidance of tall structures combined with avoidance of human disturbance may prevent sage-grouse from recruiting to areas near wind turbines. Monitoring and modeling analyses show that wind developments have mostly impacted connectivity between occupied areas.

WDFW, Bonneville Power Administration (BPA), BLM, YTC and Pacific Power are working together to identify mitigation measures for the Vantage to Pomona Heights 230 kV Transmission Line project to preclude impacts to sage-grouse in the area. Concerns for impacts to sage-grouse are based on model and model validation efforts that are an outgrowth of the connectivity research of Robb and Schroeder (2012 and 2013) and other recent research (Stonehouse 2013). Also, a ten-year study in Nevada has shown an effect of distance to transmission lines on sage-grouse nest success and female survival (Gibson et al. 2013). Since there is active research in this area, more information is anticipated in the future.

#### **4.3.3 Provide technical advice to regulatory agencies to minimize the negative effects of energy and mining exploration, development, and construction activity in important sage-grouse habitats.**

In 2010 BLM published IM 2010-071 that dealt with sage-grouse management considerations for energy development. In particular the IM lists actions to be taken on BLM land to minimize the need for listing under the ESA. However, in Washington there has been no mineral exploration in sage-grouse PACs due

to lack of mineral potential. Sand, gravel and columnar basalt mining do have potential to occur on BLM lands within PACs (J. Lowe pers. comm.).

#### **4.4 Ensure compatibility of grazing management on public lands managed for sage-grouse.**

##### **4.4.1 Where protection and restoration of sage-grouse is a major objective for public lands, manage grazing so that the habitat characteristics needed for breeding and wintering can be consistently maintained.**

The ecosystem standards law of 1994 (HB 1309) was the original legislation to require DNR and WDFW to evaluate and protect the soils and vegetation on state-managed grazed land to mitigate impacts to sage-grouse and their habitat. Since then, additional laws have been passed (RCW 70.13.610 and RCW 77.12.204) to develop standards and practices to meet the goals to “preserve, protect and perpetuate wildlife on and fish on shrub steppe habitat or lands that are currently agricultural lands, rangelands or grazable woodlands.”

Livestock grazing is currently not permitted on the majority of WDFW-managed lands within the sage-grouse management units. Where grazing is permitted, grazed lands experience less than 35% utilization, meet habitat objectives, and are consistent with state Ecosystem Standards (RCW 77.12.204, 79.13.610) (J. Burnham pers. comm.).

WDFW’s wildlife areas HCP will address grazing practices on WDFW wildlife areas. The draft grazing conservation measure includes the following protections to sage-grouse and sage-grouse habitat:

- WDFW will not initiate new grazing permits in sage-grouse nesting habitat.
- Leks will not be grazed during the lekking season.
- In nesting habitat, grazing will not occur in the same individual locations at the same time of year for more than two consecutive years.
- Utilization will not exceed 35% bunchgrass utilization by height in areas of >80% livestock accessibility.

The following ranges of habitat characteristics defined by Connelly et al. (2000) are the desired levels for achieving high ecological integrity in sage-grouse nesting habitat.

- Sagebrush component that averages 16 to 32 inches high and 15 to 25% cover.
- Grass-forb component that averages >7 inches high and >15% cover on arid sites and >25% cover on mesic sites.

Restrictions specific to activities associated with grazing:

- During the lekking season, activities associated with grazing that require only human presence, use of hand tools, and vehicle use on roads will not occur in or within a half mile (0.80 km) or within view of an occupied lek before 10:00 AM. After 10:00 AM, such activities are unrestricted.
- During the lekking season, activities associated with grazing that require the use of power tools, agricultural equipment, heavy equipment, or vehicles off of roads will not occur in or within 1.25 miles (2.0 km) of an occupied lek before 10:00 AM. After 10:00 AM, WDFW will not conduct activities associated with grazing that result in chronic disturbance in or within 1.25 miles (2.0 km) of an occupied lek.



- New seep and spring development, installation of diversion structures, trough placement, and fence construction will not be conducted in leks. New seep and spring development, installation of diversion structures, trough placement, and fence construction will not be conducted in nesting habitat unless WDFW determines that the likelihood of nesting in the affected area is low. Persons conducting allowed activities are required to:
  - Watch for sage-grouse nests;
  - Report nests if found; and
  - Avoid nests by at least 300 feet.

No vehicles other than ATVs may be used off of roads, trails, or parking areas, to conduct activities associated with grazing in sage-grouse nesting habitat during the nesting season. Persons using ATVs during the nesting season will be instructed in how to identify and avoid sage-grouse nests.

YTC ceased all permitted livestock operations on YTC in the mid-1990s in response to sage-grouse concerns with the exception of a seasonal domestic sheep trail-through. Requests for trail-through are evaluated on a case-by-case basis and have not occurred annually or not been allowed each time they have been requested, especially in the SGPA during lekking and nesting season.

#### **4.4.2 Minimize grazing damage to soil crusts.**

Rest-rotation grazing systems that minimize surface disturbance during the dry seasons or when soil is extremely wet, and maximizes the length of time between disturbances is the preferred strategy for grazing to limit damage to soil crusts (Belnap et al. 2001). Kaltenecker et al. (1999) cautioned against a “one size fits all” approach to rest-rotation grazing prescriptions since some biological crust communities are more resistance to disturbance than others, and others recover more quickly because the amount of annual precipitation and duration of cool or high temperatures greatly affect recovery times. BLM implements rest rotation on some allotments and deferred rotation on other allotments (J. Lowe, pers. comm.). The SGI funds modifications such as fences and water developments to allow more rest-rotational grazing. Through the SGI, 83,000 acres of private lands have implemented rest-rotational grazing in Washington.

On WDFW-managed lands within the sage-grouse management units, grazing is typically managed with rest or deferred rotation during the winter months. On and off dates provide adequate rest for vegetation recovery and minimize exposure of soil crusts to livestock trampling during vulnerable times of year (J. Burnham pers. comm.).

#### **4.4.3 Ensure that grazing leases on lands managed for sage-grouse are compatible with sage-grouse habitat needs.**

On WDFW lands within the range of sage-grouse there is minimal grazing (Section 4.4.1). WDFW’s range ecologist and staff monitor ecological integrity using widely accepted methods (Herrick et al. 2005) to ensure that grazed lands experience less than 35% forage utilization, meet habitat objectives, and are consistent with state Ecosystem Standards (RCW 77.12.204, 79.13.610). Some DNR shrub-steppe lands in sage-grouse management units that may otherwise be grazed are leased to WDFW and are either not grazed or grazed according to WDFW standards.

DNR has hired a new range specialist to improve monitoring compliance and ensure enforcement of legal and contractual standards for DNR grazing leases on DNR-owned land. DNR manages more than

100,000 acres of land in sage-grouse PACs in Douglas, Lincoln, and Grant Counties. 34,000 acres of that land are covered by grazing leases. DNR applies measures to protect sage-grouse habitat on land that they lease for grazing. The leases comply with the 1994 Ecosystem Standards for State-Owned Agricultural and Grazing land (HB 1309) and subsequent laws (RCW 79.13.610 and RCW 77.12.204), in order to ensure a healthy ecosystem. The standards are updated according to the latest science for effects to habitat. Implementation includes protections to native plant species and communities in riparian and upland areas and protection of limited habitats. Habitat impacts are managed through the timing of grazing and utilization levels. Timing restrictions and utilization standards for native bunchgrasses (the primary grass type) on DNR land within sage-grouse PACs are:

- Graze no more frequently than one in three years during the critical growth period for primary species.
- Apply deferred grazing on each pasture a minimum of once in three years. Deferred grazing means to rest the pasture during the active growth period and graze it in the dormant period.
- Forage use is restricted to grazing no more than 50% of current available growth during the active growth period (March 1 to June 15) and no more than 60% in the dormant period (June 16 to the end of February) (C. Ohlson-Kiehn pers. comm.).

Within the sage-grouse PACs additional protections are applied to shrub-steppe habitat:

- Protect shrub-steppe habitat where possible.
- Protect habitat from development and conversion to agricultural uses where possible.
- Ensure compatibility of grazing management with sage-grouse management.

Other specific RMP standards that may be included in agricultural leases include:

- Plant a conservation cover. One of the goals of this is to enhance wildlife habitat.
- Maintain native vegetation to provide permanent wildlife habitat cover.
- Plant and maintain a vegetated corridor between riparian and upland plant communities to facilitate wildlife movement.
- Plant and maintain food and cover for upland wildlife (C. Ohlson-Kiehn pers. comm.).

BLM provides guidance through IM–WO–43 to address grazing impacts on ecosystems and guidance specific to Washington will be reflected in BLM’s Washington RMP (in prep.). BLM has been proactive with regard to grazing management, particularly in areas within PACs. Grazing reductions that include reduced stocking levels and utilization (35%) as well as changes to season of use have been implemented on a 15,000 acre allotment in the Moses Coulee PAC. The rotations are set up to avoid grazing in areas that are most likely to support nesting birds during the breeding season. Other areas have also had reductions in stocking levels and rest rotations implemented and BLM continues to evaluate shrub-steppe habitat for adjustments to grazing management to benefit sage-grouse.

Coordination with NRCS when developing BMPs and vegetative objectives is important particularly when it applies to the SGI. BLM works to achieve Land Health Standards (43 CFR 4180) on leased land especially if those standards may affect greater sage-grouse or its habitat. BLM has a process to identify appropriate actions when Land Health Standards are not met which includes evaluating the effects of those actions on sage-grouse or its habitat prior to authorizing grazing on an allotment that is not achieving land health standards. When practicable, an interdisciplinary team is deployed to evaluate progress towards land health standards if grazing is a causal factor in not achieving the standards. BLM

works to plan and authorize livestock grazing on their land to maintain and/or improve sage-grouse habitat and analyze the effects of grazing using the NEPA process.

The draft Douglas County MSGCP (in review) has grazing guidelines for developing grazing management plans on private covered lands with the objective of promoting better habitat and encouraging plant productivity and vigor, seed production, photosynthesis, recovery, and re-growth. These draft guidelines include:

- Graze a pasture no more than once every third year during the critical period for key bunchgrass species (boot stage through seed formation: April 20 to July 15).
- Manage utilization to achieve:
  - No more than 40 percent utilization during the growing season.
  - No more than 60 percent utilization during the dormant season.
- Maintain a minimum stubble height of five inches at all times on desirable bunchgrasses. Note that a stubble height of eight inches is better than five inches in appropriate growing sites.
- Manage livestock distribution to minimize overgrazing. Tools such as fencing, the placement of water and salt, and riding can be used.
- During winter, use one smaller sacrifice area for feeding to minimize impacts to shrub-steppe and other habitats.
- 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.

Species specific measures for areas with sage-grouse leks, adjacent to leks, or in likely occupied habitats include the provision that CRP takeout or other land conversion not occur between March 15 and July 14.

In likely occupied nesting habitat, grazing would not be allowed from March 1 through December 31 in the first year of a three year rotation to promote nesting cover. In year two grazing would be deferred from January 1 through July 15. Year three would allow grazing according to the individual farm plan rotation.

#### **4.4.4 Fence lands to exclude livestock when necessary to protect and restore sage-grouse habitat.**

WDFW lands have all been fenced to exclude livestock where needed within the occupied range of sage-grouse.

The Yakama Nation has a wild horse population that has impacted shrub steppe habitat. They have fenced 19,500 acres to exclude horses and they are currently constructing enclosure fences around an additional 18,000 acres. Additional funding is being pursued to enlarge the original enclosure to protect an additional 30,000 acres (D. Blodgett III, Pers. Comm.).

#### **4.4.5 Evaluate the potential impact of elk wintering on WDFW lands on sage-grouse movement between populations, and identify and implement ways to minimize impacts.**

Elk are present, but in numbers so low that they do not overlap, and have not been observed to impact the occupied range of sage-grouse. However, there are management units (i.e., Colockum and Umtanum)

where elk may impact potential sage-grouse habitat in the future and at that time the impacts will be evaluated.

#### **4.5 Manage riparian habitats on public lands to support sage-grouse conservation.**

##### **4.5.1 Promote recovery of vegetation in riparian zones degraded by past over-grazing.**

Restoration efforts are currently underway on the YTC and on WDFW-controlled wildlife areas. Many areas within the sage-grouse management units have been subject to long-term grazing in the past but the management described in 4.4.1 will facilitate the continued recovery of previously damaged areas. Several areas within or adjacent to riparian areas on WDFW controlled lands have been fenced to exclude livestock and some have been reseeded.

##### **4.5.2 Avoid moderate to heavy livestock grazing, road development, and human disturbance in wet meadows.**

YTC limits land-use activities in riparian habitats and restricts vehicle access to designated crossing sites. In addition, YTC monitors riparian resources and implements vegetation restoration and erosion control projects when necessary to restore, enhance, and protect riparian resources. WDFW also limits livestock grazing on their lands and does not permit moderate to heavy livestock grazing on lands within sage-grouse management units. See 4.6 for a discussion of WDFW road management.

The draft Douglas County MSGCP (in review) limits grazing in riparian areas through the following measures:

- Grazing is not allowed in undisturbed riparian areas.
- In riparian areas where grazing is allowed, access is limited by controlling the season of grazing and the length of the grazing period.
- Use of upland areas is promoted through the use of off-stream watering sites or herd management.
- Utilization of woody species in riparian areas will not exceed 50 % of annual leaf and twig growth unless the grazing system allows for adequate recovery following heavier use.

#### **4.6 Discourage expansion of road systems on public lands in management units.**

##### **4.6.1 Avoid adding new roads, trails, or right-of-ways.**

WDFW maintains an inventory of roads and actively works to reduce road impacts on its lands. For example, WDFW formally abandoned 51.5 miles of forest roads from 2009 to 2013. In contrast, new road construction is minimized and usually entails placement of limited road segments, usually less than a mile per year. In most cases new roads are only located in strategic locations where they provide greater management benefits and less environmental impacts than the roads that they replace (R. Tveten pers. comm.).

There are strict guidelines for adding roads on the YTC since the YTC has an established transportation system to support its land-use. YTC periodically assesses roads for possible closure considerations. Pioneering of new roads is discouraged and maintenance/improvement of existing roads takes place to reduce erosion impacts.

#### **4.6.2 Avoid improvements such as grading and widening of existing unpaved roads that receive little use.**

Grading and widening of roads is an issue everywhere, but particularly in areas dominated by private land. There has been little change in road building and upgrades on private land. On WDFW managed land, roads may be graded or widened if there is a net benefit to the resource such as upgrades to a road needed to provide access for firefighting vehicles.

#### **4.6.3 Promote closures of unnecessary roads or those that are negatively impacting habitat quality.**

This has been accomplished on WDFW lands and some BLM lands.

Policy 6012, Managing Public Access on Department Lands, provides a framework that addresses WDFW's mandate to preserve, protect, perpetuate, and manage the wildlife and fish of the state, while providing sustainable fish and wildlife related recreational and commercial opportunities. Public access management is sometimes necessary to balance the protection of fish and wildlife resources or WDFW infrastructure with the public desire for access to WDFW lands. Department lands may require short-term, seasonal, or permanent closures for a variety of reasons including the minimization of impacts to wildlife, such as sage-grouse. In many cases WDFW road access is limited to agency management activities to minimize impacts to sage-grouse and other wildlife species. Permanently closing a road that is providing public access requires a SEPA analysis to determine the effects of that road closure on the public.

#### **4.7 Monitor changes in sage-grouse habitat through remote sensing and mapping.**

Land managers in sage-grouse habitat are working toward using remote sensing to evaluate changes in habitat quantity, quality, and distribution over time. To accomplish this, the collection and sharing of data is being initiated among various agencies and groups including WDFW, BLM, DNR, YTC, YN, TNC and USFWS, but to date this has only been accomplished in part. The general distribution of habitat has been mapped as part of connectivity research that has been ongoing (Robb and Schroeder 2012). The missing aspect to this effort is an ability to use remote sensing to address habitat quality. This issue could be addressed with a research project that takes advantage of the available spatial data layers (produced for connectivity work) and produces an occupancy model that is appropriate to Washington (M. Schroeder pers. comm.).

### **5 Work with landowners to protect the most important sage-grouse habitat on private land.**

#### **5.1 Acquire easements when landowners are willing to negotiate conservation agreements.**

TNC has 2,700 acres of conservation easements in shrub-steppe/sage-grouse habitat in Douglas County (C. Warner pers. comm.).



## **5.2 Acquire habitat where there are willing sellers and when it provides the best option to protect and/or restore critical habitats.**

WDFW has acquired lands including Sagebrush Flat (~13,000 acres), Swanson Lakes (~21,000 acres), and portions of L.T. Murray (~52,000 acres). BLM has consolidated 30,000 acres in the Crab Creek and Moses Coulee areas. An additional 400,000 acres of public land is present in the management zones; some is occupied by sage-grouse but unoccupied habitat has value for range expansion and connectivity between populations.

### **5.2.1 Identify important parcels of sage-grouse habitat on private land that may be at risk of development or loss.**

The land acquired in the L.T. Murray (See 5.2) included 17,000 acres of at-risk shrub-steppe habitat known as the Skookumchuck Ranch. Acquisition by WDFW ensured that habitat on the Skookumchuck Ranch will not be converted to other uses such as agriculture or development. Sprawl and conversion to agriculture remain the most significant threats to the remaining shrub-steppe in Washington. Funding the acquisition required broad local support that involved a cooperative partnership with the Kittitas County Cattlemen and the Farm Bureau.

A condition of the acquisition was that grazing would continue to occur at some level on the land. A grazing plan was developed as part of the Wild Horse Coordinated Resource Management (CRM) planning process. The CRM covers management of 62,000 acres of land owned by private landowners, WDFW, WDNR, BLM, and Puget Sound Energy. CRM development was the result of cooperation among many local landowners, agencies, and organizations (ranchers, Farm Bureau, NRCS, Kittitas Audubon, Solar \$, Washington Cattlemen's Association, and Kittitas Field and Stream). Participation in the CRM allowed WDFW to provide technical assistance that ensures that livestock grazing is accomplished in a manner that maintains or achieves key habitat requirements for sage-grouse (CRM 2010).

### **5.2.2 Work with landowners to determine if there are willing sellers of important habitats.**

### **5.2.3 Use existing funding sources for potential acquisition including the Wildlife and Recreation Program (WWRP).**

From 2005 through 2011 WDFW has used WWRP grants to acquire 3,406 acres that include shrub-steppe habitat in Lincoln, Grant and Douglas Counties. WWRP is a program under the Washington State Recreation and Conservation Office and it provides funding for land protection through acquisition. Additional acquisitions that include shrub-steppe habitat are being pursued with WWRP funds in Douglas and Okanogan Counties. These acquisitions are being evaluated for acquisition in 2014 and total 6,300 acres.

TNC in Washington State has acquired 29,502 acres of shrub-steppe in potential sage-grouse habitat in Douglas and Grant Counties (C. Warner pers. comm.).

### **5.3 Provide advice to counties and regulatory agencies to increase protection of sage-grouse habitat.**

PHS information is available online which makes it readily available to counties and regulatory agencies. Information on how the counties use PHS information is in Section 4.3.3. WDFW developed PHS management recommendations that identify how to avoid and minimize impacts to shrub-steppe (Azerrad et al. 2011). These management recommendations were developed at the request of local governments for development planning near shrub-steppe and are available from <http://wdfw.wa.gov/publications/01333/>.

## **6 Facilitate and promote the use of incentives, such as Farm Bill conservation programs, to benefit sage-grouse.**

### **6.1 Assist landowners by providing information, advice, or materials for implementing incentive programs available for habitat protection and restoration.**

#### **6.1.1 Identify the best local opportunities for enhancing sage-grouse habitat and assist landowners interested in incentive programs.**

Washington has been very successful in using Farm Bill programs to benefit sage-grouse. WDFW and DNR continue working with the FSA and the NRCS to provide technical advice (planting requirements and priority areas) and to enroll and re-enroll landowners in CRP including State Acres for Wildlife Enhancement (SAFE). SAFE began in 2008 and is a voluntary program under CRP that addresses state and regional high-priority wildlife objectives. The projects that have SAFE acres allocated to them have to be approved by the Farm Service Agency (FSA). Several projects were approved in Washington with the shrub-steppe project and sage and sharp-tailed grouse project potentially benefiting sage-grouse (Table 5). WDFW works with landowners enrolled in SAFE to develop farms plans that are beneficial to sage-grouse.

In 2010 NRCS began sign-up for a new program, SGI, which benefits sage-grouse by providing financial incentives to ranchers for implementing rotational grazing. Interested landowners are assisted in applying for grants to protect natural resources, restore habitat, and conserve wildlife on private lands. In addition to CRP, grant programs authorized in the 2002 Farm Bill included the Grassland Reserve Program (GRP), Wildlife Habitat Incentives Program (WHIP), Environmental Quality Incentives Program (EQIP), and the Conservation of Private Grazing Lands Program. These very popular programs have led to thousands of conservation acres (Table 5) and this habitat should be supporting sage-grouse for at least the next decade with existing contracts. After that, the fate of the program will rely on federal funding and support to continue extending contracts with private landowners. Additional research that would benefit the federal agencies and sage-grouse includes information on an index of environmental benefits that will help prioritize locations for program enrollment.

**6.1.2 Assist with securing grants for conservation easements or habitat protection and restoration through 2002 Farm Bill programs such as CRP, Wildlife Habitat Incentives Program and Grassland Reserve Program.**

The Farm Bill incentive based programs have been very successful at converting agricultural lands back into shrub-steppe. Quality of habitat depends on the length of time that the land is enrolled and the initial planting regime. Some of the conservation acreage in Douglas County for example has been enrolled for more than 20 years and is beginning to resemble native shrub-steppe habitat in structure (Schroeder et al. 2012). For conservation lands that have been enrolled for 10 to 20 years, the sagebrush may encroach and become established even if it wasn't in the original planting mix (M. Schroeder pers. comm.). CRP and SAFE enrolled lands include private lands and DNR managed lands in sage-grouse HCAs. DNR has more than 18,000 acres enrolled in CRP within PACs in Lincoln and Douglas Counties.

**Conservation Reserve Program**

Table 5. Acres of sage-grouse habitat enrolled in CRP in occupied Washington Sage-grouse Management Units. Note: CRP acreage is approximate since acres enter and leave the program annually. SAFE is a program that is part of CRP but targets specific habitat restoration work.

Acres enrolled in CRP and SAFE Farm Bill Programs in occupied management units				TOTAL
Year	CRP <sup>a</sup>	SAFE (sage-grouse habitat)	SAFE (shrub-steppe)	
<2012		63,000	7,322ac	70,322ac
2012			8,900 (allocated but not enrolled yet)	
2013				
<b>Total</b>	<b>200,000 ac</b>	<b>63,000 ac</b>	<b>16,222<sup>b</sup></b>	<b>270,322</b>

<sup>a</sup>CRP acreage is based on 1993 Thematic Mapper Landsat data (Jacobson and Snyder 2000 *in* Stinson et al. 2004). CRP acreage is estimated for Mansfield Plateau, Moses Coulee and Crab Creek Management areas.

<sup>b</sup>Allocated but not yet enrolled so not included in total enrolled acreage.

**Sage Grouse Initiative**

The SGI was launched by NRCS in 2010 to conserve sage-grouse habitat on private lands in 11 western states. The initiative uses Farm Bill programs and targets ranchers in Washington to establish rest-rotation grazing systems. Infrastructure (i.e., fences, pipelines, troughs, wells) is developed to ensure a proper rest-rotation system is established. Signups have been very successful and the achievements are summarized below (Table 6).

Table 6. Sage-grouse Initiative sign-up in Washington 2010 to 2013.

Sage- Grouse Initiative Sign-up in Washington 2010 to 2013					
Year	Farm Bill Program	Contracts	Acres	Practices	Grant Amount
2010	EQIP	74	19,095	Retain Perennial cover on expiring CRP	\$1,827,769
	WHIP	3	467	Rest-rotation grazing and fence marking	\$31,088
2011	EQIP	3	5,045	Rest-rotation grazing	\$226,826
2012	EQIP	5	14,403	Rest-rotation grazing reseeded (429 ac).	\$1,286,101
	WHIP	6		2,000 (approx.)	
		1			
2013	EQIP	10	11,122	Rest-rotation grazing infrastructure development	\$869,588
<b>Total</b>		<b>103</b>	<b>52,132 acres</b>		<b>\$4,241,372</b>

**6.1.3 Provide technical assistance or materials to landowners to enhance habitat value above the minimum requirements of Farm Bill conservation programs.**

WDFW Biologists work with interested landowners to enhance habitat values in land enrolled in Farm Bill conservation programs. SAFE funds sage and sharp-tailed grouse projects that specifically target habitat improvements that will benefit sage-grouse and/or sharp-tailed grouse.

**6.2 Provide technical advice to the Natural Resources Conservation Service and the Farm Service Agency for the implementation of Farm Bill programs (CRP, GRP, WHIP, etc.) at the local, state, and national level to facilitate sage-grouse conservation in Washington and to ensure the wildlife conservation benefits intended by Congress.**

WDFW’s private lands biologists work closely with private landowners, NRCS and FSA in implementation of Farm Bill programs. WDFW staff develop individual farm plans jointly with NRCS and FSA to implement the SAFE and CRP practices in the sage grouse habitat areas.

**6.2.1 Identify priority areas in Washington where Farm Bill programs have the greatest potential to benefit sage-grouse. Prioritize areas within the Sage-grouse Management Units with current populations or with a high potential to support sage-grouse range expansion.**

Locations where Farm Bill programs have the greatest potential to benefit sage-grouse include:

- Areas that provide potential corridors connecting isolated populations (Robb and Schroeder 2012).

- Areas that support or are in close proximity to significant portions of an important habitat type, such as wintering, lekking, or nesting habitat. Grouse SAFE projects prioritize enrollment of lands proximal to lek sites.
- Areas that are at risk of an alternate land use (such as development) that would substantially impair the recovery efforts.
- Areas adjacent to existing sage-grouse populations.

### **6.2.2 Provide technical advice on planting requirements and management practices to enhance or restore potential sage-grouse habitat.**

Site specific shrub-steppe restoration plans are developed using soil type and moisture regime information. The plans are based on past knowledge and experiences with prior restoration work and new plans incorporate the information gleaned from results of prior restoration efforts. The prescriptions are adapted as new information or research results about sage-grouse habitat needs or restoration techniques become available. An example of ongoing research that may impact restoration work in the near future is the use of bacteria for cheatgrass control. WDFW, BLM and BPA were part of an effort to develop a shrub-steppe restoration manual (Benson et al. 2011) but the need for site specificity remains. BLM recently published a technical note outlining recommendations for restoration of degraded but extant shrub-steppe in eastern Washington (Dunwiddie and Camp 2013).

The YTC also has a revegetation plan for the YTC land (Nissen and Dunham 2012) and is actively restoring shrub-steppe habitat (See Section 8.3). They also have a “Sagebrush Restoration Protocol” that outlines requirements and methods for sagebrush restoration which also includes restoration of understory vegetation and measure of success (Unpublished report).

### **6.2.3 Review and comment during rule-making at the national level to ensure that Farm Bill programs continue to benefit sage-grouse in Washington.**

## **7 Facilitate management of agricultural and rangelands that is compatible with the conservation of sage-grouse.**

### **7.1 Promote the protection of remnant areas of native shrub-steppe.**

The Douglas County MSGCP establishes protections and cooperation for the protections of sagebrush habitat in Douglas County. This is done with a combination of conservation practices and Farm Bill program enrollment. The MSGCP estimates the current Habitat Suitability Index acres at 165,240 acres and it is expected to expand in 10 years to 181,764 acres and in 50 years to 190,026 acres. In addition the Pygmy Rabbit Safe Harbor agreement includes 120,532 acres of shrub-steppe much of which overlaps these acres (USFWS 2006).

#### **7.1.1 Encourage the protection of remnant shrub-steppe by providing information about the importance of shrub-steppe remnants in the matrix of lands enrolled in federal conservation programs.**

Federal conservation programs have been successful at protecting shrub-steppe in the past (1990s), but the number of new acres signed up in recent years has declined due to many reasons related to timing of contract renewals, new programs (SAFE), and economic reasons related to crop prices (M. Schroeder



pers. comm.). In general, all agricultural conservation programs benefit remnant shrub-steppe by providing a suitable habitat matrix. The CRP lands in Douglas and Grant Counties are a good example of this. Sage-grouse in those management units have increased in recent years and appear to have benefitted from a unique configuration of 52% shrub-steppe, 10-16% CRP and 29-37% cropland. The highly fragmented nature of the landscape has meant that the remaining shrub-steppe exists in relatively small patches of good quality (Schroeder et al. 2012).

### **7.1.2 Discourage burning of CRP and vegetation along the edges of farm fields and roadsides, particularly where remnant patches of shrub-steppe may be burned in the process.**

NRCS does not recommend burning of a CRP field for site preparation or mid-contract management, although operators can legally use burning as site preparation with a Department of Ecology burn permit.

### **7.1.3 Discourage spraying practices that result in the accidental or incidental spraying of remnant areas of shrub-steppe with insecticides and herbicides.**

The risk of accidental or incidental spray of shrub-steppe is relatively low. There is little desire to “waste” chemicals on shrub-steppe so spraying shrub-steppe does not routinely happen (M. Schroeder pers. comm.).

### **7.1.4 Promote removal of old fences, unused equipment, and refuse from shrub-steppe remnants.**

Old fences are regularly removed from WDFW and YTC land, but fence removal on private land has not occurred as often. See Section 2.4.3 for miles of fence removed on the YTC and in Lincoln and Douglas Counties.

## **7.2 Work with range managers interested in sage-grouse conservation to utilize range management practices that result in increased habitat value for sage-grouse.**

### **7.2.1 Support range management practices that result in retention of residual perennial grass cover and healthy communities of native perennial grasses and the associated for and shrub communities.**

Several approaches have been used in Washington to work towards this goal:

- Livestock have been removed from public lands (most WDFW lands and all YTC land).
- New WDFW grazing permits within sage-grouse management units have conservative forage allotments, specific grazing rotations, and both extensive and intensive monitoring. Grazing is sometimes used by WDFW as a tool to improve shrub-steppe habitat (J. Burnham pers. comm.).
- Grazing pressure has been reduced on public lands (BLM and DNR).
- The Douglas County Multi-species General Conservation Plan was developed for range management on private lands in the Moses Coulee and Mansfield Plateau units. It is currently being reviewed by USFWS.
- The Sage-Grouse Initiative has resulted in improved range management on private land through the funding of infrastructure necessary for rest-rotation grazing systems.
- The Grassland Reserve Program has resulted in improved range management on private land.

## **7.2.2 Discourage development of additional springs and underground water wells for livestock unless it can be shown that the result will benefit sage-grouse.**

State owned agricultural and grazing lands leases must comply with the 2004 Greater Sage-grouse Recovery Plan (Stinson et al. 2004) and Ecosystem Standards for State-Owned Agricultural and Grazing Land (HB 1309). On WDFW managed land, development of additional springs and underground water wells for livestock rarely occurs on sage-grouse management units. Spring or well development that occurs increases overall livestock distribution while also reducing livestock pressure on the spring area, loafing areas, or nearby riparian habitat and should benefit sage-grouse habitat (J. Burnham pers. comm.). Future water developments will comply with WDFW's HCP currently under development.

## **7.2.3 Discourage removal of sagebrush from known sage-grouse wintering areas and areas that provide escape cover in breeding habitat, especially within 3 km of leks.**

In general, WDFW does not remove sagebrush within sage-grouse management units. In rare cases, sagebrush may be removed to facilitate the restoration of understory species that are also important to sage-grouse (Section 8.3.3).

## **7.2.4 Establish grass banks to provide alternative range during drought.**

WDFW does not have any formally designated grass banks. WDFW does encourage livestock operators to conservatively stock their leased and deeded lands and strives to use conservative stocking rates in estimating forage production. Conservative stocking rates allow livestock operators to continue grazing operations during drought conditions without overgrazing and with a minimum of herd reduction and/or supplemental feeding (J. Burnham pers. comm.).

## **7.3 Promote agricultural practices which use fewer chemicals.**

### **7.3.1 Discourage use of organophosphorus and carbamate insecticides and herbicides in sage-grouse habitats.**

There is practically no insecticide use in shrub-steppe of Washington.

Glyphosate is commonly used to aid in site preparation of fallow fields undergoing active restoration and broadleaf-selective herbicides are used for spot application to control noxious weeds (Section 2.1.2). Herbicide is not used to control sage-brush on public land but may be used on private land.

WSU is researching a biological control (suppressant) for cheatgrass, medusahead rye (*Taeniatherum caput-medusae*), and jointed goatgrass (*Aegilops cylindrical*) that appears promising as a replacement for herbicides to control those weeds (USFWS 2013). There are currently three plots on private land in Douglas County, one on Sagebrush Flat WLA and seven other plots within sage-grouse management units. The results of research on bacterial suppressants for these weeds may provide a much needed means for control and may facilitate restoration of the forb component in shrub-steppe habitat.

### **7.3.2 Promote management strategies which minimize the potential exposure of sage-grouse to pesticides.**

#### **7.4 Promote agricultural practices which result in improved soil conservation, such as reduced tillage and stubble retention.**

WDFW was involved in the development of the Douglas County MSGCP that includes best management practices to decrease the effects of agricultural management on covered species. The plan, which incorporates sage-grouse as a covered species and includes part of the Moses Coulee and Mansfield Plateau Sage-grouse Management Units, is currently being reviewed by USFWS.

### **8 Restore degraded and burned sage-grouse habitat within Sage-Grouse Management Units.**

#### **8.1 Identify and prioritize areas for restoration.**

Prioritization of restoration areas had previously only been done on a coarse scale (occupied range versus unoccupied range) but additional products such as the Washington Connected Landscapes Project have provided insights at a finer scale (WHCWG 2013). In this analysis, barriers and restoration opportunities have been modelled within linkages and surrounding areas between sage-grouse HCAs. Between leks, analyses of barriers and restoration opportunities have also been modelled (Schroeder et al. 2013b). This information can be used to prioritize restoration work in order to better link and reduce barriers between HCAs.

The ALI is also prioritizing land in the range of the sage-grouse for conservation action, with sage-grouse as one of the target species.

#### **8.2 Prepare contingency plans for habitat restoration to be used after wildfires.**

Generic restoration plans have been developed for many public lands (WDFW, BLM, YTC), but not for private lands. The shrub-steppe restoration manual that was produced by BLM, BPA, and WDFW is a useful guide to restoration techniques for use on shrub-steppe after wildfires (Benson et al. 2011).

#### **8.3 Restore degraded sage-grouse habitat.**

Restoration of degraded sage-grouse habitat has been occurring on WDFW and other public lands (BLM, USFWS, YTC, and DNR) within the management units as funding for restoration is secured. Some of this restoration includes fire impacted area. The YTC has a large shrub-steppe fire impact sagebrush reseeding effort that is in the third year of a five year project (Table 7). Acreage is not available for YN land but 3,500 sagebrush plugs will be planted in burned areas within the horse enclosure area in 2014.

Table 7. Restoration of degraded sage-grouse habitat in Washington.

Management Unit/ acres	Years	Comments
<b>Crab Creek</b>		
1,904 acres	<2004	BLM and WDFW land in and near SLWLA, Lincoln County; most were native grass/forb mix.
906.5 acres	2004 to 2013	BLM and WDFW land. 300 acres were also overseeded with sagebrush into existing native grass/forb mix after 2012 Apache Fire.
<b>Moses Coulee and Mansfield Plateau</b>		
1,031 acres	2004 to 2013	Sagebrush Flats and Wells WLAs - Douglas County; All on Sagebrush Flat WLA except 54 acres on Wells WLA. BLM and WDFW land (includes 223 acres of fire rehabilitation).
<b>Yakima Training Center</b>		
13,000 acres	2010 to 2015	Fire rehab; Year 2 completed of 5 year plan of seeding and planting sagebrush on fire impact areas <sup>a</sup> .
<b>Hanford Reach National Monument</b>		
59,580 acres	2005 to 2013	Treatments overlap in acres: 50,273 acres treated for invasives. 50,802 acres seeded with native seed mixes of grasses, forbs and shrubs. 26,613 acres planted with native shrubs and forbs (3,575,725 plants) <sup>b</sup> .

<sup>a</sup> C. Leingang pers. comm.

<sup>b</sup> H. Newsome pers. comm.

### 8.3.1 Shrub-steppe restoration projects should use native seed sources.

Native seed for restoration work was difficult to acquire in the past but the availability of native seed is improving as more land is restored and demand increases. Recent requests by WDFW and BLM for native seed resulted in several competitive bids being submitted (J. Cotton pers. comm., J. Lowe pers. comm.). Native forb seed continues to be less available than native grass seeds so a full complement is not yet available. WDFW, BLM, USFWS, and YTC use native species preferentially over desirable non-native species. Ideally locally derived or local source native seed from the same seed zone and biotype would be used (M. Teske pers. comm.). The shrub-steppe and grassland restoration manual includes a seed zone map for the Columbia Basin (Benson et al. 2011).

YTC is in the process of constructing a green-house to facilitate the use of native forb species in their restoration efforts.

### **8.3.2 Suppress cheatgrass and weeds.**

The procedures used in restoration of shrub-steppe include suppression of cheatgrass and weeds through the use of mechanical and chemical means (Benson et al. 2011). Use of bio-control agents is currently being researched for cheatgrass, medusahead rye, and jointed goatgrass but may not be available for widespread use for several years (Section 7.3.1; USFWS 2013). YTC annually implements a noxious weed program to address non-native species.

### **8.3.3 Restore bunchgrass and native forb understory to degraded areas.**

WDFW has not focused on restoration of degraded areas but has focused on restoration and rehabilitation of abandoned agricultural fields and CRP land (Benson et al. 2011).

The USFWS has a history of restoring native grasses after fires on the Hanford National Monument. The effectiveness of the restorations is being monitored. BLM has also done small-scale restoration of degraded native bunchgrass/forb sites.

The YTC has established a forb nursery for use in their ongoing habitat restoration work.

### **8.3.4 Re-establish sagebrush where the shrub component has been lost.**

Currently YTC is in the third year of a five year sagebrush restoration project that includes both planting and seeding of sagebrush in fire impacted areas. Areas within the SGPA receive first priority for such efforts (C. Leingang pers. comm.).

WDFW restoration work in the Crab Creek, Mansfield Plateau and Moses Coulee Management Units includes seeding sagebrush in some areas (Table 7).

### **8.3.5 Restore degraded wet meadows or vegetation at developed springs.**

## **8.4 Document methods, treatments, timing, and results of all restoration projects.**

WDFW in cooperation with BPA and BLM has published a guidebook on the success and failures of past restoration efforts. The manual was developed to capture the decades of experience and hard-earned knowledge acquired in shrub-steppe restoration work in the Columbia River Basin. This document is designed as an electronic manual that will be updated regularly as new restoration information becomes available (Benson et al. 2011). In addition, WDFW documents and monitors restoration work on the wildlife areas in Washington.

BLM has recently published a framework for restoring shrub-steppe that models the ecological dynamics of restoration using seven different shrub-steppe “starting states” and four “restored states” (Dunwiddie and Camp 2013).

YTC conducts annual monitoring of its restoration efforts utilizing a variety of methods including photo point analysis and transects. Results of restoration efforts are reported annually (C. Leingang pers. comm.).

Recent research to determine whether plugs or bare root stock works best for sagebrush planting was conducted on the Hanford National Monument and plugs survived more consistently (Dettweiler-Robinson et al. 2013). Additional research has shown that seedlings are established more successfully than seeding in restoration of crested wheatgrass (*Agropyron cristatum*) fields (Davies et al. 2013).

## **9 Conduct research necessary to conserve sage-grouse populations.**

### **9.1 Monitor the genetic health of sage-grouse populations.**

Between 1992 and 2010 approximately 400 tissue samples of Washington sage-grouse were collected by YTC and WDFW. YTC funded the genetic analyses by the WDFW Molecular Genetics Laboratory (MGL) of baseline sage-grouse samples and the evaluation of the initial 2004 to 2006 translocation effort on the YTC to provide information on reproductive success and survival of native and translocated birds. In the second phase of genetic monitoring the YTC contracted with the MGL to look at 2010 YTC samples and compare them to sage -grouse tissue samples from Moses Coulee, Nevada, and Oregon (Small et al. 2011).

As part of the WHCWG connected landscapes project, the Great Northern Landscape Conservation Cooperative (GNLCC) of the USFWS funded a 2011 study where MGL compared the genetics of the Washington sage-grouse populations. Initial results show strong patterns of genetic variation throughout the Washington populations (Small et al. 2011).

Feathers are currently being collected annually (Crab Creek, Moses Coulee, Mansfield Plateau, and YTC) as a way to continue monitoring genetic health. USGS is continuing to look at range-wide genomics including feather samples collected by WDFW (<https://www.sciencebase.gov/catalog/item/527906bbe4b0c04ac3417acc> ).

### **9.2 Evaluate and adapt population monitoring techniques.**

Continue using the established techniques for monitoring populations in Washington until better techniques are established.

### **9.3 Investigate the demographics and population dynamics of sage-grouse.**

This is currently being done using radio-telemetry studies in the YN, YTC, and Crab Creek. Results are compiled in annual reports (Schroeder et al. 2012).

### **9.4 Research methods for increasing the populations of sage-grouse, such as reducing predation through manipulation of habitat features.**

YTC is in the second year of a three year sage-grouse predator assessment and management plan effort. Identification of habitat features that promote predation is an element of this assessment (JBLMYTC 2012a).

This type of research is ongoing in other portions of the range. Periodic literature reviews are conducted to maintain an up-to-date approach (Knick and Connelly 2011).

### **9.5 Determine the effectiveness of habitat management methodologies.**

#### **9.5.1 Evaluate the importance of CRP lands in relation to sage-grouse abundance and distribution.**

Schroeder and Vander Haegen (2011) documented the importance of CRP for sage-grouse in Washington. They state that CRP is a long-term investment since sagebrush requires years to mature, so the age of the CRP affects the value of the habitat to sage-grouse. The location of the CRP within the landscape is also important with land located within extant shrub-steppe likely more beneficial to sage-grouse. They also



stress the need for additional studies in different locations throughout the range of sage-grouse. In Douglas and Grant Counties, the fragmented landscape that includes patches of high quality shrub-steppe, CRP, and cropland has appeared to allow increases to occur in that population (Schroeder et al. 2012).

### **9.5.2 Monitor wildlife responses to restoration efforts.**

The CRP SAFE fields that are restored with FSA funding require monitoring for wildlife response to restoration of shrub-steppe. Baseline bird point counts are conducted prior to restoration done twice in the spring (usually May and June) and are repeated at least every five years after restoration according to an established protocol (Huff et al. 2000). The counts are done more frequently in some areas. Also in a study of 43 radio-collared sage-grouse reintroduced to Lincoln County, Stonehouse (2013) found that grouse selected for restored fields and that restored fields was one of the strongest predictors of intensity of use by sage-grouse in Lincoln County.

### **9.6 Research practical methods for restoring the forb component required by sage-grouse.**

Shrub-steppe restorations as part of federal conservation programs and smaller-scale efforts on lands managed by WDFW and BLM are used to refine methods for forb restoration. As lessons are learned, they are published in reports and applied to future management. Restoration of forbs in existing stands of sage, grass, and weeds in various precipitation zones and soil types continues to be challenging (Section 7.3.1).

Restoring forbs is least difficult when starting from a fallow field with a new CRP-SAFE enrollment. Currently the agricultural fields that are planted for shrub-steppe restoration undergo a multi-step and multi-year process. The process used is approximately what is described for shrub-steppe restoration in Benson et al. (2011). Restoration is a three-year strategy that emphasizes site prep/weed control in year one that renders a firm seedbed into which native grass is planted. Selective herbicides are applied over the grass seedlings for the first growing season to achieve more control over the broad-leaf weeds, and then forbs are planted or seeded in the second growing season. From that point on, weed control is mostly by mowing. Although this is an outline of the process, the restoration plans are site specific and must be closely followed.

There are numerous forb species found in shrub-steppe in Washington but not all are available commercially and not all are known to be required by sage-grouse. Currently, a suite of approximately nine forb species are seeded along with sagebrush when agricultural fields are being restored for CRP. This may change as more forb seed becomes commercially available.

YTC is in the process of constructing a greenhouse to facilitate forb restoration and YTC has funded past efforts to evaluate certain forb germination protocols.

## **10 Cooperate and coordinate with other agencies and landowners in the conservation, protection, and restoration of sage-grouse in Washington.**

### **10.1 Participate in the development of a multi-agency conservation action plan.**

The State of Washington has participated at both the technical level and the policy level on the State-Federal Sage-Grouse Task Force (SGTF). This multi-state and multi-agency task force was formed by the

Western Governors and Secretary Salazar to develop a range-wide conservation strategy and implement high priority conservation actions to ensure the long-term viability of the species. In addition, WDFW participated in the technical review and development of the Conservation Objectives Team (COT) report that focuses on the reduction and amelioration of threats to sage-grouse (USFWS 2013a). The Washington Greater Sage-Grouse Working Group began in 1997 and meets annually for information exchange and conservation and management planning.

## **10.2 Secure funding for recovery activities.**

Since funding to implement recovery objectives comes from multiple sources, it is beyond the scope of this document to give a full accounting of funding sources but some of the sources are highlighted here. BLM has been a major source of funding for research, monitoring, fence marking, power-line removal and habitat restoration. BPA has funded land acquisition and operations in shrub-steppe habitat in the past. USFWS Recovery funding has been used for translocations and reintroductions. WDFW's Aquatic Lands Enhancement Account funds habitat restoration projects led by volunteer efforts and those funds were used to remove fence in sage-grouse habitat. Additional sources of funding come by way of the State General Fund, State Wildlife Grants, Pittman Roberts, the Washington Wildlife and Recreation Program under the Recreation and Conservation Office and Personalized License Plates.

YTC successfully secures funding on an annual basis to implement tasks within the WDFW's Greater Sage-grouse Recovery Plan. YTC has also provided funding to support the Yakama Nation, Shrub-steppe Collaborative Partnership coordinator position, and genetic analysis of sage-grouse samples. YTC has provided in-kind support for reintroductions and regional habitat/connectivity assessments (C. Leingang pers. comm.).

## **10.3 Participate in the interagency Washington Sage-grouse Working Group.**

The Washington Sage-grouse Working Group (Working Group) began in 1997 and is a partnership of federal, state, and tribal agencies with land management responsibilities and non-governmental organizations in central Washington. Its purpose is to provide a forum for exchange of information on sage-grouse conservation, and to facilitate the implementation of sage-grouse recovery. A partial list of Working Group participants includes WDFW, BLM, Audubon, Puget Sound Energy, U. S. Army (YTC), YN, Pheasants Forever, Douglas County PUD, USFWS, and private landowners. The group has met at least once annually and has accomplished some of its general goals to date.

## **10.4 Assist with and provide technical advice for the development of the Douglas County Multiple Species Conservation Plan.**

The Douglas County MSGCP is intended to facilitate protection of four federally listed and candidate species within the planning area and includes measures to protect sage-grouse. General Conservation Plans are authorized under Section 10 of the federal Endangered Species Act. WDFW and USFWS aided the Foster Creek Conservation District in the development of the MSGCP which includes the greater sage-grouse as a covered species. Approval of the MSGCP is pending review by the USFWS.

There is also an opportunity to enter into a CCAA on non-Federal lands in Washington. CCAAs are formal, voluntary agreements between the USFWS and one or more parties to address the conservation needs of a candidate species. Participants voluntarily agree to implement specific actions that are

designed to reduce or remove threats to a covered species, so that listing may not be necessary. The CCAA provides participating property owners with assurances that if they implement certain conservation actions for species in the CCAA they will not be required to implement additional conservation measures should the species become listed. Also, additional land, water or resource use limitations will not be imposed on them in the future unless they agree to those changes.

## **10.5 Help facilitate the exchange and dissemination of information about shrub-steppe restoration and management for sage-grouse.**

### **10.5.1 Participate in the Washington Shrub-steppe Working Group.**

The Washington Shrub-steppe Working Group (WSSWG) was a group of primarily botanists that was formed to promote collaboration and information exchange among agencies, organizations, and researchers working on mapping, research, restoration, and land management of Washington shrub-steppe. The group included WDFW, WDNR, USGS, BLM, NRCS, Foster Creek Conservation District, TNC, Pacific Biodiversity Institute, and the Kettle Range Conservation Group. Because the WSSWG goals are a subset of ALI goals, the WSSWG no longer meets. Some participants are now part of the ALI, which includes public, private and tribal interests working together to conserve and restore arid lands in Washington.

## **11 Develop public information materials and educational programs for landowners, schools, community organizations and conservation groups as needed.**

### **11.1 Create and distribute updated fact sheets, management recommendations, and video or slide shows on the status and recovery needs of sage-grouse in Washington.**

#### **11.1.1 Develop educational materials.**

NRCS and BLM have developed websites, fact sheets and other outreach materials that are available online ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wa/programs/?cid=nrcs144p2\\_036221](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/wa/programs/?cid=nrcs144p2_036221) and [http://www.blm.gov/wo/st/en/prog/more/sage\\_grouse\\_home2.html](http://www.blm.gov/wo/st/en/prog/more/sage_grouse_home2.html) ). These materials are primarily focused on SGI but they contain additional information about sage-grouse and sage-grouse conservation. Also, BLM has produced a 20-minute educational video, entitled “The Vanishing Shrubsteppe,” by award-winning producer, Thomas Ager. It is available from BLM, 915 N Walla Walla, Wenatchee WA 98801-1521; 509-665-2100.

The Wenatchee School District has developed a 5th grade science curriculum for a field study of shrub-steppe that includes information about sage-grouse (Ballinger and Rutherford 2004).

#### **11.1.2 Priority species (PHS) management recommendations for sage-grouse.**

WDFW’s PHS Management Recommendations for sage-grouse are available at <http://wdfw.wa.gov/publications/00026/> (Schroeder et al 2003).

## References

- Azerrad, J. M., K. A. Divens, M. F. Livingston, M. S. Teske, H. L. Ferguson, and J. L. Davis. 2011. Management recommendations for Washington's priority habitats: managing shrub-steppe in developing landscapes. Washington Department of Fish and Wildlife, Olympia, Washington
- Ballinger, S. and K. Rutherford. 2004. Shrub-steppe'n Up: A Wenatchee School District 5<sup>th</sup> grade science curriculum.
- Beck, J. L., K. P. Reese, J. W. Connelly, M. B. Lucia. 2006. Movements and survival of juvenile greater sage-grouse in southeastern Idaho. *Wildlife Society Bulletin* 34:1070-1078.
- Belnap J., J. H. Kaltenecker, R. Rosentreter, J. Williams, S. Leonard, D. Eldridge. 2001. Biological soil crusts: Ecology and management. Technical Ref. 1730-2. USDI, BLM and USGS. 110 pp.
- Benson, J. E., R.T. Tveten, M. G. Asher and P.W. Dunwiddie. 2011. Shrub-Steppe and Grassland Restoration Manual for the Columbia River Basin. WDFW, Olympia, Washington.
- Blus, L.J., C.S. Staley, C. J. Henny, G. W. Pendleton, T. H. Craig, E. H. Craig, and D. K. Halford. 1989. Effects of organophosphorus insecticides on sage-grouse in southeastern Idaho. *Journal of Wildlife Management* 53:1139-1146.
- Cadwell, L. L., J. L. Downs, M. A. Simmons, C. J. Murray, Y. J. Chien, R. N. Kickert, and R. K. Zufelt. 2001. Sage-grouse on the Yakima Training Center: Part III – habitat/decision support modeling to anticipate impacts from military training activities. Contract #DE-AC06-76RL01830, Pacific Northwest National Laboratory, Richland, Washington.
- Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. *Wildlife Society Bulletin* 28:967-985.
- Connelly, J. W., K. P. Reese, and M. A. Schroeder. 2003. Monitoring of greater sage-grouse habitats and populations. Contribution No. 979, College of Natural Resources Experiment Station, University of Idaho, Moscow, Idaho.
- Davies, K. W., C. S. Boyd, A. M. Nafus. 2013. Restoring the sagebrush component in crested wheatgrass-dominated communities. *Rangeland Ecology and Management* 66(6):472-478.
- Dettweiler-Robinson, E., J. D. Bakker, J. R. Evans, H. Newsome, G. M. Davies, T. A. Wirth, D. A. Pyke, R. T. Easterly, D. Salstrom and, P. W. Dunwiddie. 2013. Outplanting Wyoming Big Sagebrush following wildfire: Stock performance and economics. *Rangeland Ecology and Management* 66(6):657-666.
- Douglas County Multi-species General Conservation Plan (MSGCP). In Review.
- Dunwiddie, P. and P. Camp. 2013. Enhancement of degraded shrub-steppe habitats with an emphasis on potential applicability in eastern Washington. Tech Note. Bureau of Land Management, Spokane District, Spokane, WA. 88 pp.
- Dwyer, J. F., and K.W. Doloughan. 2014. In prep. Testing systems of avian perch deterrents on electric power distribution poles in sage-brush habitat. *Human-Wildlife Interactions*.
- Ellison, L. 1960. Influence of grazing on plant succession of rangelands. *The Botanical Review* (26):1-78.
- Emergency Management Division. 2014. Washington Military Department Natural Hazards – Drought ([http://www.emd.wa.gov/hazards/haz\\_drought.shtml](http://www.emd.wa.gov/hazards/haz_drought.shtml)).

- Gibson, D. E. Blomberg, and J. Sedinger. 2013. Dynamics of greater sage-grouse (*Centrocercus urophasianus*) populations in response to transmission lines in central Nevada. Progress Report December 2013. 67 pp.
- Hayes, D. W., M. J. Tirhi, D.W. Stinson. 1998. Washington State status report for the sage grouse. Washington Department of Fish and Wildlife, Olympia. 62 pp.
- Herrick, J.E., J.W. Van Zee, K.M. Havstad, L.M. Burkett, W.G. Whitford. 2005. Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems. USDA-ARS, Jornada Experimental Range, Las Cruces, NM (Distributed by University of Arizona Press, Tucson, AZ).
- Holtkamp, J. A. and M. A. Davidson. 2009. Transmission Siting in the Western United States: Overview and Recommendations Prepared as information to the Western Interstate Energy Board. White Paper. ([http://www.hollandhart.com/articles/Transmission\\_Siting\\_White\\_Paper\\_Final.pdf](http://www.hollandhart.com/articles/Transmission_Siting_White_Paper_Final.pdf)) 56 pp.
- Huff, M. H., K. A. Bettinger, H. L. Ferguson, M. J. Brown and B. Altman. 2000. A Habitat-Based Point-Count Protocol for Terrestrial Birds, Emphasizing Washington and Oregon. USDA FS Pacific Northwest Research Station. General Tech. Report PNW-GTR-501. 39 pp.
- IUCN/SSC Reintroduction Specialist Group (eds). 2009. Guidelines for the Re-introduction of Galliformes for Conservation Purposes. Gland, Switzerland IUCN and Newcastle-upon-Tyne, UK: World Pheasant Association. 86 pp.
- Jamison, B. E., and M. F. Livingston. 2004. Sage-grouse evaluation in the shrub steppe ecosystem of the Yakama Reservation, Washington. Project Final Report, Interagency Agreement No. GP00065800. Yakama Nation Wildlife Resource Management, Toppenish, Washington.
- JBLMYTC (Joint Base Lewis McChord Yakima Training Center) Environmental Division. 2012. 2012 Revision of Appendix A: Sagebrush Restoration Protocol (contained within Livingston, M.F. 1998. Western Sage-grouse Management Plan, Engineering and Environment and Directorate of Environment and Natural Resources Division, Yakima Training Center, June 1998.)
- JBLMYTC. 2012a. Final 2012 sage grouse habitat assessment and predator survey at Joint Base Lewis McChord Yakima Training Center, WA. Prepared by Vernadero Group. 118 pp.
- JBLMYTC. 2012b. Integrated Wildland Fire Management Plan. 27 pp.
- Kaltenecker, J. H., M. C. Wicklow-Howard, and R. Rosentreter. 1999. Biological soil crusts in three sagebrush communities recovering from a century of livestock trampling. Pp. 222-226 in E. D. McArthur, W. K. Ostler and C.L. Wambolt compilers. Proceedings: Shrublands Ecotones. 12-14 August 1998, Ephraim, Utah. USDA Forest Service, Rocky Mtn Research Stn, Proc. RMRS-P-11, Ogden Utah.
- Knick, S. T. and J. W. Connelly, eds. 2011. Greater sage-grouse: Ecology and conservation of a landscape species and its habitats. Studies in Avian Biology. Volume 38).
- Lincoln County. 2009. Community Wildfire Protection Plan. 85pp.
- Livingston, M. F. 1998. Western Sage Grouse Management Plan (1 October 1998 to 30 September 2003). Yakima Training Center. 76 pp.
- Livingston, M. F., and P. Nyland. 2002. Sage grouse breeding, distribution, and habitat use, Yakima Training Center 1999-2001. Unpubl. Report. 80 pp + maps.
- Murphy, T., D. E. Naugle, R. Eardley, J. D. Maestas, T. Griffiths, M. Pellant, and S. J. Stiver. 2013. Trial by Fire: Improving our ability to reduce wildfire impacts to sage-grouse and sagebrush ecosystems through accelerated partner collaboration. Rangelands 35:2-10.
- National Land Cover Dataset. <http://www.epa.gov/mrcd/nlcd-2001.html>
- Northwest Gap Analysis Project. <http://gap.uidaho.edu/index.php/gap-home/Northwest-GAP>

- Reese, K. P., and J. W. Connelly. 1997. Translocations of the sage grouse *Centrocercus urophasianus* in North America. *Wildlife Biology* 3:235-241.
- Robb, L. A., and M. A. Schroeder. 2012. Habitat Connectivity for Greater Sage-Grouse (*Centrocercus urophasianus*) in the Columbia Plateau Ecoregion. Appendix A.2 in Washington connected landscapes project: analysis of the Columbia Plateau Ecoregion (Washington Wildlife Habitat Connectivity Working Group), Washington's Department of Fish and Wildlife, and Department of Transportation, Olympia, Washington.
- Robb, L. A., and M. A. Schroeder. 2013. Network centrality, pinch-points, and barriers and restoration opportunities for greater sage-grouse, Chapter 3, in Washington Wildlife Habitat Connectivity Working Group, Columbia Plateau Ecoregion Connectivity Analysis Addendum: Habitat Connectivity Centrality, Pinch-points, and Barriers/Restoration Analyses. Washington's Department of Fish and Wildlife, and Department of Transportation, Olympia, WA
- Schroeder, M. A. 1997. Unusually high reproductive effort by sage grouse in a fragmented habitat in north-central Washington. *The Condor* 99:933-941.
- Schroeder, M. A. 2001. Dispersion of nests in relation to leks in fragmented habitat in north-central Washington. Job Progress Report Federal Aid in Wildlife Restoration Project No. 3 Upland bird population dynamics and management. Washington Department of Fish and Wildlife.
- Schroeder, M. A., and W. M. Vander Haegen. 2011. Response of Greater Sage-Grouse to the conservation reserve program in Washington State. Pp. 517–529 in S. T. Knick and J. W. Connelly (editors). *Greater Sage-Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology* (vol. 38), University of California Press, Berkeley, CA.
- Schroeder, M. A., M. Atamian, H. Ferguson, M. Finch, and D. W. Stinson. 2012. Reintroduction of greater sage-grouse to Lincoln County, Washington. Progress Report. Washington Department of Fish and Wildlife, Olympia, Washington.
- Schroeder, M. A., M. Atamian, H. Ferguson, M. Finch, K. Stonehouse, and D. W. Stinson. 2013c. Reintroduction of greater sage-grouse to Lincoln County, Washington. Progress Report. Washington Department of Fish and Wildlife, Olympia, Washington.
- Schroeder, M. A., D. W. Hays, M. F. Livingston, L. E. Stream, J. E. Jacobson, and D. J. Pierce. 2000. Changes in the distribution and abundance of sage grouse in Washington. *Northwestern Naturalist* 81:104-112.
- Schroeder, M. A., A. Shirk, and L. Robb. 2013a. Transmission line scenarios and relative impacts to connectivity and nesting habitat for greater sage-grouse on the YTC. White Paper included in WHCWG USFWS Recovery Funds Report. 5pp.
- Schroeder, M. A., A. Shirk, and L. Robb. 2013b. Leks and linkages for greater sage-grouse in Washington. Overview paper prepared for the Washington Wildlife Habitat Connectivity Working Group (WHCWG) as part of the Final Report for Agreement number F12AP00595 with the U.S. Fish and Wildlife Service, Washington Connected Landscapes Project: Columbia Plateau Ecoregion Analysis.
- Schroeder, M.A., D.W. Stinson, M. Atamian and M. Livingston. 2012. Greater sage-grouse management units in Washington State draft report for the Conservation Objectives Team. 7 pp.
- Schroeder, M. A., D. Stinson, and M. Tirhi. 2003. Greater sage-grouse (*Centrocercus urophasianus*). *Priority Habitat and Species Management Recommendations Vol. IV: Birds*. 19 pp.



- Small, M. P., S. Bell, S. M. Blankenship, C. A. Dean, and K. I. Warheit. 2011. Genetic Analysis of greater sage-grouse (*Centrocercus urophasianus*) at the Yakima Training Center post-augmentation (2011) and comparisons to Moses Coulee, Oregon and Nevada populations. Draft WDFW Molecular Genetics Lab Report to US Department of Defense. 19 pp.
- Stevens, B. S., K. P. Reese, J. W. Connelly and D. D. Mush. 2012. Greater sage-grouse and fence: Does marking reduce collisions? *Wildlife Society Bulletin* 36(2): 27-303.
- Stinson, D. W., D. W. Hays, and M. A. Schroeder. 2004. Washington State recovery plan for the greater sage-grouse. Washington Department of Fish and Wildlife, Olympia, Washington. 109 pp.
- Stiver, S.J., A.D. Apa, J.R. Bohne, S.D. Bunnell, P.A. Deibert, S.C. Gardner, M.A., Hilliard, C.W. McCarthy, and M.A. Schroeder. 2006. Greater Sage-grouse Comprehensive Conservation Strategy. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. 444pp.
- Stonehouse, K. F. 2013. Habitat selection by sympatric translocated greater sage-grouse and Columbian sharp-tailed grouse in eastern Washington. M.Sc. thesis, Washington State University, Pullman, Washington.
- U.S. Code of Federal Regulations. Title 50, Part 17. May 7, 2001.
- U.S. Fish and Wildlife Service (USFWS). 2009. Wildland Fire Management Plan Hanford Reach National Monument. 162 pp.
- USFWS. 2001. 12-month finding for a petition to list the Washington population of western sage grouse (The *Centrocercus urophasianus phaios*). *Federal Register* 66(88): 22984-22994.
- USFWS. 2006. Template Safe Harbor Agreement for the Columbia Basin pygmy rabbit. Joint document produced by the U.S. Fish and Wildlife Service and WDFW. 30 pp.
- USFWS. 2013a. Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report. U.S. Fish and Wildlife Service, Denver, CO. February 2013.
- USFWS. 2013b. A New Biological Management Option against Cheatgrass Raises Hope of Western Land Managers. Pacific Region Press Release April 1, 2013.
- Washington Department of Ecology. 2014. Drought Information. <http://www.ecy.wa.gov/drought/index.html> .
- Washington Department of Fish and Wildlife (WDFW). 2012. Swanson Lakes Wildlife Area 2012 Management Plan Update. 7 pp.
- WDFW. 2010. [http://inside.dfw.wa.gov/metadata/WS\\_OCCURPOLYGON.htm](http://inside.dfw.wa.gov/metadata/WS_OCCURPOLYGON.htm).
- WDFW. 2013. Threatened and Endangered Wildlife in Washington: 2012 Annual Report. Listing and Recovery Section, Wildlife Program, Washington Department of Fish and Wildlife, Olympia. 251 pp.
- WDFW. 2013b. Re-introduction of Sage-grouse to Lincoln County, Washington: Progress Report. 26 pp.
- Washington Wildlife Habitat Connectivity Working Group (WHCWG). 2010. Washington Connected Landscapes Project: Statewide Analysis. Washington Department of Fish and Wildlife, and Department of Transportation, Olympia, WA.
- Washington Wildlife Habitat Connectivity Working Group (WHCWG). 2012. Washington Connected Landscapes Project: Analysis of the Columbia Plateau Ecoregion. Washington Department of Fish and Wildlife, and Department of Transportation, Olympia, WA.

Washington Wildlife Habitat Connectivity Working Group (WHCWG). 2013. Columbia Plateau  
Ecoregion Connectivity Analysis Addendum: Habitat Connectivity Centrality, Pinch-Points, and  
Barriers/Restoration Analyses. Washington Department of Fish and Wildlife, and Department of  
Transportation, Olympia, WA.

Yocum, C. F. 1956. The sage hen in Washington State. *Auk* 73: 540-550.

## Personal Communications

Justin Allegro  
Renewable Energy Section Manager  
WDFW  
Olympia, WA

Mike Atamian  
Wildlife Biologist  
WDFW  
Spokane, WA

David Blodgett III  
Wildlife Biologist  
Yakama Indian Nation Resource Management  
Toppenish, WA

Jeff Burnham  
Range Ecologist  
WDFW  
Yakima, WA

Margen Carlson  
Ecosystem Services Division Manager  
WDFW  
Olympia, WA

John Cotton  
Fish and Wildlife Biologist  
WDFW  
Ephrata, WA

Jon Gallie  
Fish and Wildlife Biologist  
WDFW  
Wenatchee, WA

Colin Leingang  
Department of Defense  
Yakima Training Center  
Yakima, WA

Jason Lowe  
Wildlife Biologist  
BLM  
Spokane, WA

Calvin Ohlson-Kiehn  
Acting Strategic Advisor to Deputy of Uplands  
WDNR  
Olympia, WA

Daniel Peterson  
Wildlife Area Manager  
WDFW  
Brewster, WA

Michael Schroeder  
Upland Bird Research Scientist  
WDFW  
Bridgeport, WA

Derek Stinson  
Wildlife Biologist  
WDFW  
Olympia, WA

Mark Teske  
Fish and Wildlife Biologist  
WDFW  
Ellensburg, WA

Richard Tveten  
Fish and Wildlife Biologist  
WDFW  
Olympia, WA

Chuck Warner  
Arid Lands Program Director  
The Nature Conservancy  
Wenatchee, WA

